Disaster preparedness collaboration between Banda Aceh and Japan

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Abstract. As a disaster-prone area, the city of Banda Aceh was one of the locations that experienced an earthquake and tsunami that destroyed parts of the city at the end of 2004. An earthquake with a magnitude of 9.3 SR accompanied by a tsunami resulted in almost half of the settlement area of Banda Aceh being severely damaged. After destroyed by the biggest earthquake in Indonesia in the past few decades, the city of Banda Aceh has now recovered and is preparing itself as a city that is alert to disasters. The city recovery process has proceeded relatively quickly, and this has influenced the enthusiasm of citizens to be involved in working with various domestic and foreign institutions that helped build Aceh post-disaster. One of the countries that have collaborated with the Banda Aceh city government in disaster preparedness is the Japanese government. The collaboration was manifested in the form of sharing experiences, training, and discussions on disaster mitigation in the construction of the city of Banda Aceh as a sustainable city that is disaster prepared. With the openness of the city government to accept input and support from outside, many disaster preparedness-based activities are carried out to educate the public to be alert for disasters. For this reason, the study seeks to evaluate the disaster preparedness of the city of Banda Aceh, especially the coastal settlements of the city of Banda Aceh that are prone to the tsunami disaster. This aspect of the review in disaster preparedness-based research includes post-disaster plans to develop coastal urban settlements and rescue routes. The study began with a discussion of the initial mitigation plan a year after the 2004 disaster, followed by the conformity of the implementation of mitigation plans for several earthquakes that occurred in Banda Aceh between 2005 and 2018. In comparison, disasters and mitigation plans in Japan were also discussed. The results of this study are expected to be a reference for a better urban disaster mitigation planning not only for Banda Aceh but also can be used in other cities in Indonesia.

1. Introduction
The major disaster that struck Aceh province on December 26, 2004, began with an earthquake measuring 9.3 on the Richter scale cantered on the Indian Ocean, west of the island of Sumatra, Indonesia. This earthquake caused tsunami with a height of 30 meters and resulted in 230,000 deaths in 14 countries, 130,000 of which occurred in Banda Aceh, Indonesia [1]. After that day, many smaller aftershocks have continued to occur in the Aceh region to date.

Banda Aceh City area which is on the active fault line of Sumatera Semangko Fault is one of the areas prone to earthquakes and landslides. For this reason, according to existing regulations for
disaster-prone areas, the Indonesian government has obligations and responsibilities in anticipating disasters before or after a disaster, namely with gradual efforts from disaster mitigation, emergency response and reconstruction rehabilitation [2]. Of the three stages, mitigation is interpreted as an effort to minimize the impact caused by the disaster. While the second, the emergency response period is defined as the speed in aiding when a disaster occurs in a region. And the third, the rehabilitation-reconstruction phase is to rebuild the area damaged by the disaster by paying attention to disaster mitigation-based spatial planning.

Readiness to deal with disasters is a necessity. Disasters that have occurred in Indonesia, especially in Aceh, have increasingly opened the eyes to the importance of responding quickly to overcoming the effects of disasters. In disaster preparedness, several important things that need to be dealt with quickly include handling victims and improving the environment in the disaster area, improving public infrastructure and facilities, building community houses, trauma counselling, socio-economic and cultural recovery, restoring security and order also restoring government functions and public services. In addition to aiding, evaluation and research actions on post-disaster handling steps need to be continuously improved. Therefore, research on the sustainability of post-disaster handling also needs to be strengthened. The research can be used as a reference for relevant officials and institutions in carrying out their duties in the field.

In connection with the existence of disaster-prone areas of Aceh, local governments and communities are also demanded awareness to be better prepared to face the possibility of future disasters. Various efforts to increase awareness and disaster preparedness training have been carried out by the government, both at the central and regional levels. Likewise, the policy of the Banda Aceh city government which continued to conduct socialization and disaster preparedness training to realize the city of Banda Aceh as a resilient city.

To improve disaster preparedness, the Banda Aceh City Government continues to strengthen the collaboration with various parties. One of them is the Japanese government which is a country with potential disaster risks like Indonesia, namely the earthquake and tsunami. As a city just emerging from the devastating earthquake and tsunami in 2004, Banda Aceh still has a lot of homework to be improved, starting from the implementation of the concept of disaster risk reduction to the realization of a resilient and sustainable city [3].

For this reason, the city government needs a lot of support both from within and outside the country. In addition to disaster preparedness, Banda Aceh also needs support in the development of the economic, education and health sectors. At present Japan has implemented a multi-system in disaster risk reduction efforts, starting from an early warning system, building 400 kilometres of sea walls, coastal forests, water channel canals, and determining safety zones for residents. This multi-system implementation has proven to be effective where the death toll can be significantly reduced when the tsunami hit the Higashimatsushima city area in 2011. Of the potential fatalities at that time predicted in the disaster scenario around 200 thousand can be reduced to 20 thousand people.

From the experience of the Japanese government, ideally the development of the economic sector and the development of disaster risk reduction system in a region must be balanced. For the concept of disaster mitigation, Japan has invested a long time after the defeat of the war in 1945. While in addition to infrastructure and technology investment, disaster education including research continues to be carried out starting from disaster education at the school level and training and disaster simulation for the community. Given that Banda Aceh and several cities in Japan have the same potential for disaster, the process of mutual learning and sharing of best practices in disaster mitigation will benefit each other, including sharing the experience of Aceh's local wisdom in the form of preserving the term Smong to educate the public.

As a follow-up to the collaboration that has been fostered since the post-disaster rehabilitation and reconstruction period of 2004, the Banda Aceh city government continues to foster relations with the Japanese government in cooperation with sharing disaster mitigation experiences including the HOPE project (Higashimatsushima Organization for Progress and Economy, Education and Energy) and CoMu (Community based Mutual Reconstruction Acceleration Program by Utilization of Local
Resources in Banda Aceh City and Higashimatsushima City). For this reason, the study seeks to evaluate the disaster preparedness of the city of Banda Aceh, especially the coastal settlements of the city of Banda Aceh that are prone to the tsunami disaster. This aspect of the review in disaster preparedness-based research includes post-disaster plans to develop coastal urban settlements and rescue routes. For comparison disaster mitigation plans in Japan also discussed. The results of this study are expected to be a reference for a better urban disaster mitigation planning not only for Banda Aceh but also can be used in other cities in Indonesia.

2. Literature review

As part of the disaster preparedness plan, the concept of disaster mitigation is defined as an effort to reduce the risk of events or series of events that threaten and disrupt the lives and livelihoods of the community. Disaster mitigation efforts can be carried out by increasing the ability to face the threat of disaster. The disaster is defined as an event that threatens, disrupts life and can lead to human casualties, environmental damage, property losses, and psychological impacts that can be caused by natural factors or human factors.

The stages of disaster mitigation are part of disaster management as an effort of all components of the government, society, and the private sector to reduce casualties and property. In the disaster management cycle, there are three components carried out, namely pre-disaster activities, emergency response during disasters and post-disaster activities. If disaster management has focused more on the aspects of emergency response and post-disaster management which have many weaknesses, disaster management focuses more on pre-disaster activities, namely disaster mitigation activities within the framework of reducing the risk and impact of disasters. Disaster events do not escape the study of public policy because it involves actions that must be carried out or not carried out by the government [4].

Based on Indonesia Law number 24 of 2007 concerning Disaster Management, disaster mitigation is defined as an effort to reduce disaster risk, both through physical development and awareness and capacity building in the face of disaster threats. Based on the understanding of the above provisions, disaster mitigation is divided into 2 (two) patterns: (a) Structural mitigation is an effort to minimize disasters carried out through the construction of various physical infrastructures and using technological approaches, such as making special canals for flood prevention, detection devices of volcanic activity, earthquake resistant buildings, or the Early Warning System used to predict tsunami waves; and (b) Non-structural mitigation, namely efforts to reduce the impact of disasters, apart from physical efforts as existing in structural mitigation.

Non-structural mitigation can be done by making urban spatial planning, community capacity building, legislation, regional planning, and insurance. Mitigation policies, both structural and non-structural, must be integrated with each other. The use of technology to predict, anticipate and reduce the risk of occurrence of a disaster must be balanced with the creation and enforcement of an adequate set of regulations that are supported by an appropriate spatial plan.

Disaster mitigation is a demand for areas that have a low level of disaster vulnerability to a high level of vulnerability. In general, disaster mitigation has not become a necessity as a development priority. Such illiteracy can be seen through the vision and mission of development from areas that have the potential to be disaster prone. Considering aspects of disaster mitigation means disaster mitigation as well as an evaluative policy process that causes policy reformulation. Although theoretically disaster management has its own stage, namely, pre-disaster emergency-post-disaster. This concept is quite clear in evaluating actions that should be carried out but does not rule out the possibility of unclear initial and final policy processes.

At the same time, disaster mitigation can be reviewed, controlled, modified, and even stopped. Disaster mitigation can be continuously formulated, implemented, evaluated, and adjusted. But this process does not occur and develops in a clear sequence, but it is a stage that continues to mix and be bound in a continuous process.
3. Methodology
This research is a type of qualitative research conducted by evaluating the disaster preparedness of the city of Banda Aceh, especially the coastal settlements of the city of Banda Aceh that are prone to tsunami disaster. The aspects that analysed in disaster preparedness-based research include post-disaster plans to develop urban coastal settlements and rescue routes. The analysis begins with a discussion of the initial mitigation plan a year after the 2004 disaster, followed by the conformity of the implementation of mitigation plans for several small earthquakes that occurred in Banda Aceh between 2005 and 2018. The mitigation plans in Japan and their experience in facing disasters are also discussed for comparison.

As supporting material in this study, secondary data information was collected from several government offices such as the 2009-2029 City Spatial Planning (RTRW) document from Bappeda office of Banda Aceh City, Banda Aceh in figures in 2011-2018 documents from BPS office of Banda Aceh. The data is a supporter in reviewing the disaster preparedness of the city of Banda Aceh. In addition, direct observation of the use of disaster evacuation lanes and spaces in the field is equipped with photo recording as primary data as well as collection of other secondary data from various literature relating to disaster mitigation research in several cities in Indonesia.

4. Discussion

4.1 Earthquake and tsunami disasters in Aceh
As a disaster-prone area, the city of Banda Aceh was one of the locations that experienced massive earthquake and tsunami that destroyed parts of the city at the end of 2004. Earthquake with a magnitude of 9.3 SR accompanied by tsunami resulted in almost half of the settlement area of Banda Aceh being severely damaged (see Figure 1).

Figure 1. Satellite imagery of the Banda Aceh City area before and after the 2004 tsunami disaster [3].

Banda Aceh is the city with the most population in Aceh Province, where before the tsunami disaster in 2004, there were around 239,000 people spread across 9 sub-districts. There are four sub-districts in the coastal city of Banda Aceh directly adjacent to the Andaman Sea and the Indian Ocean. Among these sub-districts, Meuraxa and Kutaradja Subdistrict, are two sub-districts which were severely damaged by the tsunami disaster in 2004. These two regions are also sub-districts that have a high population residing in the coastal area.

After struck by the biggest earthquake in Indonesia in 2004, the city of Banda Aceh has now recovered and is preparing itself as a city that is prepared to disasters. The city recovery process has proceeded relatively quickly, and this has influenced the enthusiasm of citizens to be involved in working with various domestic and foreign institutions that helped build Aceh post-disaster.
4.1.1 Development of population in the city of Banda Aceh after 2004 disaster.

As the administrative center of Aceh Province, Banda Aceh City also acts as a center for regional trade and services and at the same time as the center of city-scale settlements. Administratively, the city of Banda Aceh consists of 9 sub-districts with an area of 6,135.9 ha. In one year after tsunami disaster in 2004, developments in the population of the city showed growth from the number of 177,881 in 2005 increased to 259,931 in 2017 (see Table 1).

| No | District          | Area (Ha) | Year 2005 Population | Density (p/Ha) | Year 2017 Population | Density (p/Ha) |
|----|------------------|-----------|----------------------|----------------|----------------------|----------------|
| 1  | Meuraxa          | 725.80    | 2.221                | 3              | 19.770               | 27             |
| 2  | Jaya Baru        | 378.00    | 12.340               | 33             | 25.503               | 67             |
| 3  | Banda Raya       | 478.90    | 24.257               | 51             | 23.919               | 50             |
| 4  | Baiturrahman     | 453.90    | 33.582               | 51             | 36.721               | 81             |
| 5  | Lueng Bata       | 534.10    | 19.284               | 48             | 25.607               | 48             |
| 6  | Kuta Alam        | 1,004.70  | 35.033               | 35             | 51.614               | 51             |
| 7  | Kuta Raja        | 521.10    | 2.978                | 6              | 13.365               | 26             |
| 8  | Syiah Kuala      | 1424.40   | 25.418               | 18             | 37.193               | 26             |
| 9  | Ulee Kareng      | 615.00    | 22.768               | 37             | 26.221               | 43             |
|    | **Total**        | **6,135.90** | **177.881**         | **259.931**    |                      |                |

Based on city area of 6,135.9 ha with a population of 259,931 people, the average population density of Banda Aceh city in 2017 is 42 people/ha [5]. This population density figure shows an increase from the previous 29 people / ha in 2005. The district that has the highest population density is Baiturrahman Sub-district located in the city center with a population density of 81 people/ha. While the lowest subdistricts were Kuta Raja and Syiah Kuala sub-districts with a population density of 26 people/ha.

Geographically, Kuta Raja Subdistrict, Kuta Alam, Syiah Kuala and Meuraxa are coastal areas of the city of Banda Aceh which are directly adjacent to the coast. Coastal settlements in the area are prone to disasters and have experienced severe damage during the tsunami disaster, namely most residential areas in Kuta Raja and Meuraxa Districts and some settlements in the Syiah Kuala and Kuta Alam areas.
4.1.2 Roads and rescue development in settlements
Meanwhile the plan to develop the Banda Aceh city road network was directed at a concentric radial network pattern with 2 (two) centers of cities to be served, namely in Peunayong (P1) and Lamdom/Batoh (P2) as new centers combined with cross-town route patterns. In this concentric radial concept that functions as a ring road is the South Ring road and the North Ring road [6]. Whereas roads that function as crossroad will pass or intersect with the road network that connects the two planned centers.

On a smaller scale of services in a residential environment, the environmental road network must also be clearly connected to the road network system above. However, the environmental road has not been fully planned in the City Spatial Plan like RTRW and RDTRK, therefore it is recommended that environmental road links with larger road networks be formed to form adequate circulation relationships [7]. Related to the rescue line and the building for evacuation, 3 escape buildings have been built around coastal settlements in Meuraxa sub-district [8].

![Figure 3. Post-Disaster Banda Aceh City Space Development Plan [8].](image)

4.1.3 Development of Banda Aceh post-disaster settlements
In the Banda Aceh City Spatial Plan for 2009-2029, the settlement of Banda Aceh after tsunami disaster planned with consideration of population distribution and character development of urban space and consideration of the carrying capacity and capacity of space [9]. Plans for developing residential areas are classified into 3 (three), namely:

a. Low density residential areas, directed at relatively tsunami-prone locations in the coastal area north of the tsunami-affected city, are spread in Ulee Pata Village, Cot Lamkuwueh, Blang Village, Asoe Nanggrooe, Lamjamme, Lamjabat, Lampoh Daya, Lambung, Ulee Lheue, Deah Geulumpang, Alue Deah Teungoh, Deah Baro, Gampong Baro, Blang Oi, Aceh Lampaseh, Pelanggahan, Gampong Pande, Gampong Jawa, Tibang, Lamdingin, Deah Raya, and Alue Naga.

b. Medium density residential areas, directed at a relatively safe location, namely in the central, eastern and southern regions, which are spread in Jaya Baru District, Baiturrahman, Banda Raya, Ulee Kareng, Lueng Bata, and Syiah Kuala.

c. High density residential areas, directed at a safe location around the service center of Kampung Baru/Peunayong, Lampaseh Kota, Keudah, Merduati, Sukaramai, Peuniti, Neusu Jaya, Sukadamai, Seutui, Lamteumen, Keuramat, Kuta Alam, Laksana and Mulia.
4.2 Banda Aceh city disaster preparedness program

Strengthening disaster preparedness has been carried out so that the people of Banda Aceh become a disaster resilient. This is because the Banda Aceh community had experienced a devastating disaster, namely a strong earthquake followed by tsunami on 26 December 2004. One of them was the activity of the Disaster Preparedness School by the Tsunami and Disaster Mitigation Research Center (TDMRC). This activity was carried out by teaching children about disasters at the School SDN No. 2 Banda Aceh. This disaster preparedness program was realized with the collaboration between Unesco, LIPI and TDMRC, with the hope that in the future there will be a disaster preparedness school in Aceh [10].

Likewise, the Regional Disaster Management Agency of the Banda Aceh City and Government of Aceh Province, continues to strengthen disaster mitigation to the community, so that the Banda Aceh City community is resilient to disasters. The city of Banda Aceh is a disaster-prone area, not only earthquakes and tsunamis, but also extreme weather, tornadoes and strong winds. With the strength of disaster mitigation, the community in the capital city of Aceh Province was able to reduce the impact of a disaster and be able to rise from disaster [11]. But the Banda Aceh City Government cannot build a resilient community of disasters by itself. The government needs support and participation from all parties, including the business group.

Corporate social responsibility programs are encouraged to be able to support disaster mitigation training so that communities become resilient in facing disasters. With the support of the business community on disaster mitigation, many people will receive training carried out in a sustainable manner. Disasters cannot be predicted when they occur, but people must be prepared to face them.

The Banda Aceh Regional Disaster Management Agency has made community resilience training in the program named of Resilient Village or Desa Tangguh Bencana (Destana). The activity which was attended by 40 participants was held as a follow-up of a series of activities that have been carried out in 2 Gampong (Villages), namely the Gampong Deah Glumpang and Gampong Jawa, which are included in Destana. Destana's community resilience program has been running since 2016. Several activities have been produced from the Destana program, namely the establishment of the Destana Working Group in two Gampong (Deah Glumpang and Gampong Jawa), the formation of the Village Volunteer team in Meuraxa and Kuta Raja Subdistricts. Disaster Management Plans (DMP) and Community Action Plans (CAP). The integration of DMP and CAP into the Gampong development plan, the establishment of disaster risk map documents, contingency plans and evacuation routes, has also led to the formation of a Disaster Risk Reduction forum.

Desa Tangguh Bencana program has independent ability to adapt and deal with the potential threat of disasters and make it easier for themselves to avoid the adverse effects of disasters. Some of the objectives of the Destana program are to protect people living in disaster-prone areas, increasing community participation especially vulnerable groups in managing resources to reduce disaster risk. The program can also increase institutional capacity in managing resources and maintaining local wisdom for disaster risk reduction. They also increase the capacity of the Government in providing resource and technical support in disaster risk reduction. The Destana program can also enhance collaboration between stakeholders in disaster risk reduction such as Local Governments, the private sector, Universities, NGOs, CSOs and other concerned parties.

4.3 Disaster mitigation plan in Japan

To restore the area damaged by tsunami disaster in 2011, the Japanese government prepared a special disaster response plan document such for the 2011 Tohoku Earthquake. In this document, there is a recovery plan until 2013. In this document the disaster response plan is divided into 3 stages: (a) Emergency response; (b) Rehabilitation; (c) Recovery plan.

In these stages each aspect of the planning approach is discussed as follows:

(1) Transportation; Sanriku Coastal Road is a road that was built outside the tsunami prone zone but at that time the condition was severely damaged while this route had an important role in emergency transportation routes. This road is a route for decomposing goods for victims of natural disasters. In
addition, public transportation in the form of the Shinkansen fast train was also repaired. Until March 2012 even expressways in the Tohoku region were opened free for the public. The recovery of the public vehicle lane aims to accommodate victims to meet their needs outside Tohoku and to promote local tourism [12].

(2) Residence Security; The earthquake and tsunami disaster in Tohoku destroyed more than 120,000 houses, and damaged more than 240,000 houses. For this reason, the government has created a housing reconstruction program specifically for lower-middle-income housing such as public housing so that victims who do not have a place to live can temporarily rent a place to live there.

(3) Plans for rebuilding; Steps to rebuilding in disaster affected areas in the Tohoku region, are as follows: (a) Simplify ownership licensing procedures to follow a zoning plan; (b) To accommodate new development integrated with built up areas and agriculture; (c) Immediate construction of residence.

In restoring urban areas affected by disasters, there are additional separate plans, namely (a) developing urban areas; (b) move coastal settlements to safe areas; (c) developing emergency transportation routes; (d) develop rainwater reservoir drainage; (e) building parks to protect areas from disasters; (f) development of rivers and dikes; (g) construction of artificial forests to prevent disaster risks.

In addition, the planning of the disaster mitigation concept also divides the area threatened by the tsunami into two parts: (a) The first part is the level 1 tsunami area which is a potential area affected by the tsunami with a return period of 50-150 years. Tsunamis generated by this type of earthquake have an average height of 7 to 10 meters; (b) The second part is a level 2 tsunami area which is a tsunami affected area with a return period of over 500 years to thousands of years. This type of tsunami can reach a height of 20-30 meters [13].

4.4 Collaboration between Banda Aceh city and Higashimatsushima city

Relations between Banda Aceh City and Higashimatsushima City began to intertwine after the earthquake and tsunami that hit Japan in 2011. Higashimatsushima City is one of the cities in Japan that was affected by the 2011 disaster. Meanwhile, Banda Aceh City has also experienced similar things in 2004. This collaboration gave birth to the HOPE (Higashimatsushima Organization for Progress and Economy, Education and Energy) project which was intended as the Organization for the Advancement of Economics, Education and Energy of Higashimatsushima [14].

HOPE project activities aim to increase citizen awareness and understanding of the importance of disaster mitigation, especially earthquakes and tsunamis. The proposed activities in this program are: (a) Family Escape Plan; (b) Emergency Food Preparation; (c) Making a disaster pamphlet and poster; (d) Establishing a disaster information center in Escape Building; and (e) Escape Building Renovation.

As a continuation to strengthen the cooperation relations between the two cities, a program has been designed called the CoMU Project facilitated by JICA. The aim of the CoMU Project is to encourage the creation of mutually beneficial cooperation in sustainable development between Higashimatsushima City and Banda Aceh City. The CoMU Project (Community-based Mutual Reconstruction Acceleration Program by Utilization of Local Resources in Banda Aceh City and Higashimatsushima City) is a Community-based Reconstruction Acceleration Program utilizing local resources in Banda Aceh City and Higashimatsushima City.

This project seeks to involve as many participants as possible, through seminars, training and workshops, in order to increase participants’ understanding of sustainable development and disaster management. This project has four themes in the implementation of cooperation in the field of development between Higashimatsushima City and Banda Aceh City, namely: (a) Sustainable city development; (b) Regional disaster management; (c) Community businesses that utilize local resources; and (d) Increasing the capacity of the city government.

One of the activities carried out by Higashimatsushima’s team while in the city of Banda Aceh was holding a Workshop facilitated by one of the staff of the Disaster Prevention Section of Higashimatsushima City, Japan. The purpose of this activity is to map the capacity, vulnerability, and
risk of the village and to be mapped together with the Gampong Alue Deah Teungoh community. The locations of the project activities are in three gampong areas that have Japanese-assisted Tsunami Escape Building: Lambung Village, Deah Glumpang Village and Alue Deah Teungoh Village. The three gampongs are in Meuraxa District. The community involved in the project consisted of more than 800 people.

At the beginning of 2018, CoMU Project in collaboration with the Disaster Risk Reduction Forum (DRRF) conducted a workshop related to Risk Map Mapping, Vulnerability and Capacity owned by Gampong Alue Deah Teungoh and socialization of Disaster Alert Bags for the community Gampong Alue Deah Teungoh. In addition, the workshop session was also filled with an update on the Vulnerability, Risk and Capacity (VCA) Map owned by the Village. The map is also submitted to the Head of the Gampong Alue Deah Teungoh Village, with the aim that the map can be socialized to the village apparatus to be updated annually if there is insufficient information.

5. Conclusion
In general, aspects of disaster mitigation have been considered in the preparation of the Banda Aceh City Spatial Plan. The spatial pattern of the city of Banda Aceh has been planned based on consideration of the condition of the pattern of space utilization before the disaster, the tendency of urban development after a disaster, optimization and efficiency of space utilization, environmental sustainability, and disaster mitigation. For disaster mitigation purposes, it is planned to have mangrove forests along the coast and be determined by the criteria of a green belt along the coast. However, there are also deviations from the plan, namely the failure of the plan which limits development in the disaster-prone zone. Residential areas developed into coastal areas which are in the north of Banda Aceh City. Likewise, the population density in the coastal areas of Banda Aceh shows an upward trend over time. Likewise, places and evacuation routes have not been re-evaluated to adjust to current population developments, including by planning disaster scenarios and estimating the shortest arrival time of tsunami waves.

Considering the Banda Aceh community had experienced the earthquake and tsunami disaster in 2004. Then strengthening disaster mitigation must continue to be carried out, so that the people of Banda Aceh City become resilient to the disaster. Various community debriefing activities, the implementation of preventive disaster policies, and increasing knowledge of the community about local natural characteristics that provide an indication of the threat of disaster, must be carried out continuously. Likewise strengthening the coordination of the education office on disaster preparedness curricula in the implementation of disaster preparedness for school students needs joint support between the government and the community.

The following are some important notes regarding the differences in disaster mitigation-based planning in Banda Aceh City with Japan, among others: (a) The city of Banda Aceh does not yet have a clear mitigation concept in its coastal areas, while in Japan there are clear mitigation zones and their designation; (b) There are no strict controls for spatial planning in Indonesia based on disaster mitigation, although spatial patterns have been planned in Banda Aceh, but still the population in coastal areas is still growing rapidly; (c) The disaster recovery scenario in Banda Aceh is unclear, while Japan has a target for the next 5 years, the recovery is more detailed and directed.

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