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The Tsunami Resilient Village (DESTANA) Expedition "Kibar Pataka in South Java"

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Abstract: Geological aspects and the tectonic plate shifts have become a trigger of earthquakes that have caused tsunami to spread across Indonesia. In addition, Indonesia has experience the tsunami from other causes such as the avalanche of the Anak Krakatau Mountain on December 22, 2018. The tsunami has always become a hot topic in a never ending discussion in Indonesia. Starting from the geological point of view, historical to the mystical view. However, efforts to reduce the risk of the tsunami is required to consider the characteristic of the people or communities in tsunami prone areas. By understanding the characteristic both the region and the community, we could identify the root of the problem so that the tsunami risk reduction activities carried out could be more effective and efficient. In other words, recognising the problem means that we could provide the right solution. The Tsunami Resilient Village Expedition is a new strategy introduced by the National Disaster Management Agency of Indonesia (known as BNPB), in collaboration with 800 volunteers, went down to the southern part of Java, starting from Banyuwangi, Central Java, West Java to Banten (450 villages were visited). The South Java Region is an earthquake and tsunami prone area. Furthermore, some active faults pass through the southern part of Java. In the last 25 years, there have been at least 3 tsunami events in South Java. At present, there are more than 600,000 people who are potentially exposed if an earthquake and tsunami occurs in southern Java. If it is not prepared early, we could imagine the huge number of victims and economical losses that will be caused. Interaction between volunteers and the community is also an effort to build "trust". The government is present not only during the emergency but tries to be present at pre-event. Preventive actions are far more valuable and could reduce the risk of loss to society and also the government. The South Java region keeps many historical records. Why does this expedition team need to consider a historical standpoint? It is because the history could also provide another perspective and input to develop appropriate strategies to promote disaster risk reduction in South Java. The main goal of Destana expedition is to capture various community aspirations related to preparedness, not only dissemination but volunteers with residents could do some actions. Plant trees in tsunami prone areas, for instance. There are various issues and challenges noted down during and after the expedition. Within 40 days, the team has succeed to collect various vital information, community knowledge, local government capabilities, and recommendations on how to build resilience village.

Key words: Tsunami, resilient village, resilient community, disaster management, prevention

1. Introduction

"Indonesia, We Want to Be A Resilient Community." The history of the tsunami event is presented in various languages in Indonesia, not only verbal but also in how it reacts. Culture, social life, and the environment influenced a variety of knowledge that develops in the society. In East Java, the tsunami history were left in the form of abandoned houses and left to be destroyed by age. "This house can be used as a reminder to the community," said one of the volunteers of the expedition team who followed the entire process from Banyuwangi to Banten. The Southern Java region indeed holds many historical records. The history of landscape changes which are associated with political situations and mystical stories which could convince the public of the previous events. According to a historian, Ivan Aulia Ahsan, "It is part of the tactics and strategy of the seizure of power in his era." Why does

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our Destana Expedition team need to discuss it from a historical standpoint? Because the history could also provide another perspective and input to develop appropriate strategies promoting disaster risk reduction in South Java.

Communities throughout South Java, store knowledge about tsunami events that have previously happened because of its long history. They convey it through stories with various local terms, as well as connecting them with mystical events and are believed to be a myth. Yet according to Eko Yulianto, an ancient tsunami expert from the Indonesian Institute of Knowledge (LIPI), knowledge begins with a myth, the myth is the beginning of the search. "Knowledge does not yet exist if a myth cannot be proven but knowledge will become a myth if it cannot be proven." This means that myth is an initial guiding tool of knowledge. So that the story of Ratu Pantai Selatan, written in the Babat Tanah Jawa, is believed by Eko, as an event that happened at that time. There are many records in the past, about events that occurred, which are implied in several ancient manuscripts. Pararaton wrote a story about the banyu moved, which was later interpreted as a tsunami event. Likewise the knowledge of mainland sagara sagara, became the knowledge of the people in Cipatujah, Tasikmalaya. Caik Naik, known in Pangandaran, all headed for a tsunami disaster.

Regarding those historical background, the tsunami was apparently experienced by the people in Indonesia long before colonialism entered Indonesia. Ivan Aulia Ahsan, the Tirto.Id Editor, suggested that disaster events were always followed by the ability of the people to carry out various anticipations, learning from nature had since ancient times carried out by the people of the archipelago. However, catastrophic events are associated with political problems that will occur. Disasters are often used as a sign of a power struggle event.

In addition, to track the tsunami traces of the past, the expedition team also carried out various activities, one of which was going into schools to provide dissemination and strengthening knowledge about the tsunami. Including drills to protect themselves as part of building preparedness. Not only schools were visited, but also villages, markets, and centres of noise in each area visited. Besides promotion, village officials were also invited to the dialogue, gather and assess preparedness in each of their villages. Even in several places, the village leaders succeeded in making a map of the area along with an evacuation map.

The Destana Expedition 2019 wants to capture various community aspirations related to preparedness. Tsunami-prone information boards were also established to remind the public of the tsunami enriched by QR InaRISK and InfoBMKG web-based applications. The 40-days expedition ended in Banten, closed by practicing along with an independent evacuation to escape to an evacuation site that had been built in Pandeglang region attended by the Head of BNPB, Doni Monardo. However, this expedition is not the last, this is only the beginning and would be held as a sequence.

2. Material and Methods

The research set forth in this paper is expected to be part of disaster literacy that could become an enrichment for disaster knowledge management especially in terms of the preparedness against tsunami. In the last decade, the tsunami preparedness is based only on a theory or reference both by UN-DRR and other experts. All are generalised, as if each area has the same characteristic. There is no area in this world that has the same morphological and social characteristics of the people. Each area has their uniqueness.

This expedition is a new strategy which covered 450 villages. Yet according to the Tsunami Prone Village Catalog Book (BNPB, 2018), there are 5,744 villages in Indonesia located in the tsunami prone areas.

Why do we choose expedition as a method? Because through this activity, BNPB wants to create a disaster management process with a two-way communication,

not only provides promotion. Moreover, the expedition activities are expected to accommodate the community aspirations. BNPB believes that the community is not an “empty glass”. Referring to the collaborative government concept, it turns out that the disaster management will no longer be handled only by one institution.

Why do we choose South Java? The South Java region is an area that prone to earthquakes and tsunami. As we know, some active faults pass through the southern part of Java. In the last 25 years, there have been at least 3 tsunami events in South Java. First, it was struck the southern part of Banyuwangi in 1994. In the southern part of Pangandaran (2006) and in the Sunda Strait (at the end of 2018) including at the coast of Pandeglang. At present, there are more than 600,000 people who could be exposed if an earthquake and tsunami occurs in South Java.

This research was conducted to map the resilience of villages in South Java against the tsunami so that the right strategy could be identified and developed in the future. A mixture of qualitative and quantitative methods have been used in this research. By visiting the study area, this expedition enriched with:

1) Dissemination
2) Interviews
3) Focus Group Discussion (FGD)
4) Analysis of village resilience mapping

3. Results and Discussion

One of the activities in this expedition was Village Resilience Mapping. The Village Resilience Mapping was carried out in 446 villages in 4 provinces. This mapping shows that 57% of villages traversed by the expedition are at the Pratama Resilient Level, 37% at the Madya Resilient Level and only 6% at the Utama Resilience Level. The Village Resilience Mapping is not only aim to see the condition of village readiness in managing disaster risk. This mapping of resilience is also intended to identify the strategy and direction approach needed to improve the resilience of villages in managing disaster risks, specifically tsunami.

3.1 Village Resilience Mapping Tool

The Village Resilience Mapping is carried out using an assessment tool issued by BNPB in collaboration with the Ministry of Home Affairs, the Ministry of Villages, Development of Disadvantaged Areas and Transmigration, and the National Certification Agency. The Village Resilience Assessment was carried out by analysing 5 components that were broken down into 28 indicators of resilience:

1) Component 1: Quality and Access to Basic Services; consists of 9 indicators
2) Component 2: Basic Disaster Management Systems; consists of 7 indicators
3) Component 3: Disaster Risk Management; consists of 2 indicators
4) Component 4: Emergency Preparedness; consists of 8 indicators
5) Component 5: Recovery Preparedness; consists of 2 indicators

The assessment is carried out jointly by village officials, community representatives and community leaders. Participants do the assessment assisted by a facilitator. The facilitator gives several questions to identify the condition of the village.

Each indicator has 4 tending questions. If one question cannot be answered by all participants, then the question is continued to another indicator. With the weighting mechanism, the village resilience index value is divided into 3 levels:

1) Pratama Disaster Resilience: the disaster resilience index value <58.33
2) Madya Disaster Resilience: the disaster resilience index value between 58.33 and 83.33
3) Utama Disaster Resilience: the disaster resilience index value > 83.33.

This assessment is not only to get the index of village resilience. Furthermore, this assessment

provides recommendations for activities to improve the resilience of each village.

3.2 Component 1 Analysis: Quality Resilience and Access to Basic Services

The first component identified was the Component of Quality and Access to Basic Services. This component provides an overview of the quality and access of various basic services in the village. This description is essential to see the village's potential in increasing its resilience in facing disasters.

Basic services of good quality are the main capital for villages to build resilience of their disasters. Basic services that do not meet quality, will make it difficult for villages to build resilience because villages will usually focus on improving the quality and access to basic services first. The Basic Service Quality and Access Components have 9 indicators:

1) The availability of formal and non-formal education facilities with good quality and easily achieved by the community.
2) The availability of health service facilities with good quality and easily achieved by the community.
3) The availability of transportation infrastructure that is easily accessible to the community.
4) The availability of good public services.
5) The availability of an information system that can reach all rural/urban communities quickly.
6) Strengthening independent village, village governance, and quality human resources.
7) The existence of environmental protection, sustainable management, and natural resources.
8) Strengthening protection and support for the implementation of cultural and spiritual activities in the community.
9) The existence of community security protection.

In general, villages that are considered to have good quality and access to various basic service facilities such as education, health, transportation and others. This indicates that villages in southern Java have basically been able to start developing their resilience in managing disaster risk. Some villages in the provinces of Banten, West Java and East Java still need special interventions related to the quality and access to basic services (Fig. 1).

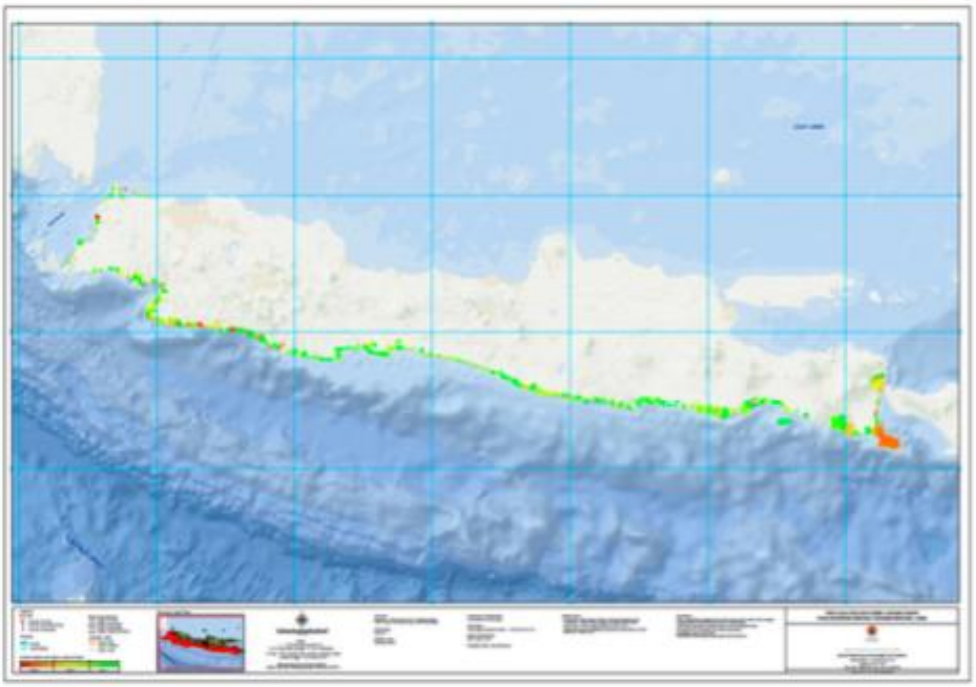

Fig. 1 Map of resilience quality and access to basic services component.

3.3 Component Analysis 2: Basis for Disaster Management Systems

The second Village Resilience Component Assessment is for the Basic Components of the Disaster Management System, The basics of disaster management systems. Villages revolve around various sets of rules, studies and village planning that support tactical activities to manage risks both before, during and after a disaster occurs. The Basic Components of the Disaster Management System consist of 7 assessment indicators:

1) There is a supporting policy in the effort to manage disaster risk in rural/urban villages
2) Availability of village/kelurahan regulations for disaster risk management in an area
3) Implementation of disaster risk assessments and the potential impacts of climate change in the village/kelurahan periodically and continuously
4) Village/kelurahan disaster management plans that are part of development planning in the vertical government
5) There is support from outside institutions for disaster risk management in accordance with village development plans or kelurahan strategic plans
6) The existence of alignment of disaster management plans and climate change adaptation between villages/villages in an area
7) Optimal participation of village or kelurahan disaster management forums in realizing village development plans or sub-district strategic plans for the kelurahan.

In general, villages considered not yet have the resilience to the Basic Components of the Disaster Management System. 34 villages crossed by the 2019 DESTANA Tsunami Expedition have high levels of resilience for this component. 328 villages are at a low level of resilience for the Basic Components of the Disaster Management System (Fig. 2).

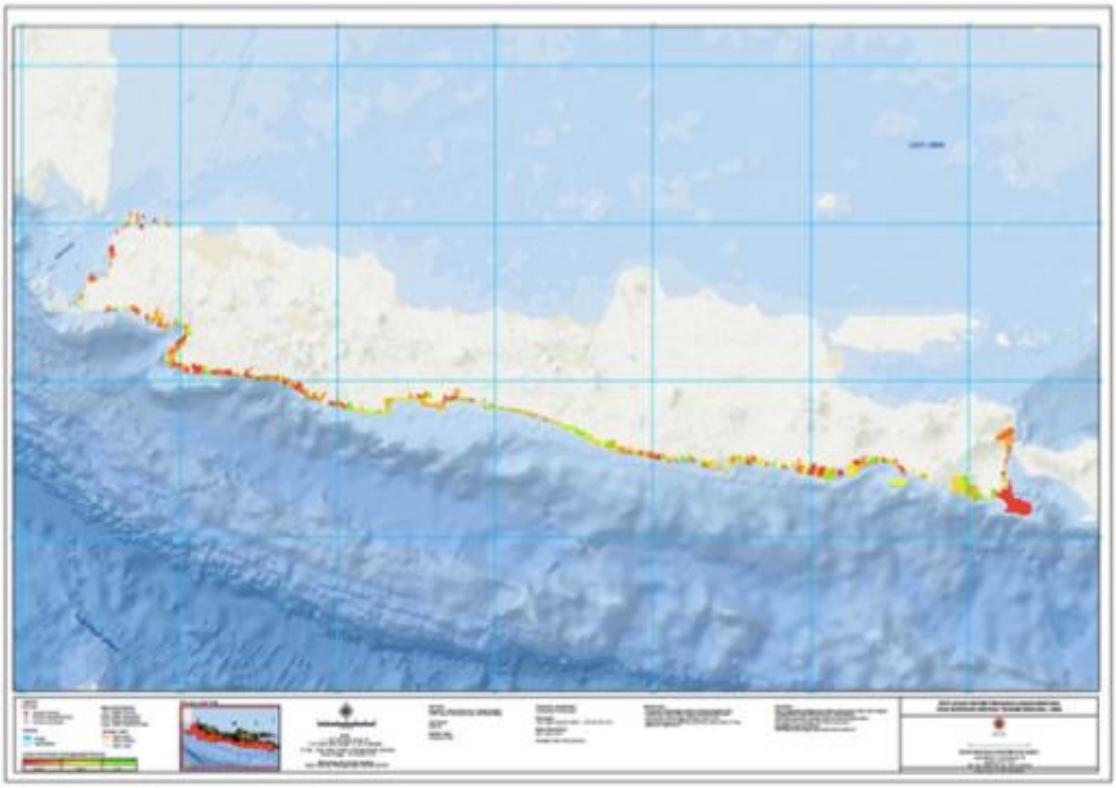

Fig. 2 Resilience map of basic components of disaster management system.

3.4 Component Analysis 3: Disaster Risk Management

The Disaster Risk Management Component Assessment focuses on tactical actions implemented by villages to reduce disaster risks. These actions can take the form of preventive actions, mitigation and all forms of disaster promotion and education in accordance with the needs of the village and the types of disaster risks that exist in the village. The Disaster Risk Management component has 2 indicators to measure all actions:

1) There is an integrated action on disaster risk management between villages in an area.
2) Increased insight and skills to manage disaster risk through education, outreach and disaster literacy.

The average value of component 3 is not much different between villages. The average total score is still at a low level for the ability to manage disaster risk at the village level (Fig. 3).

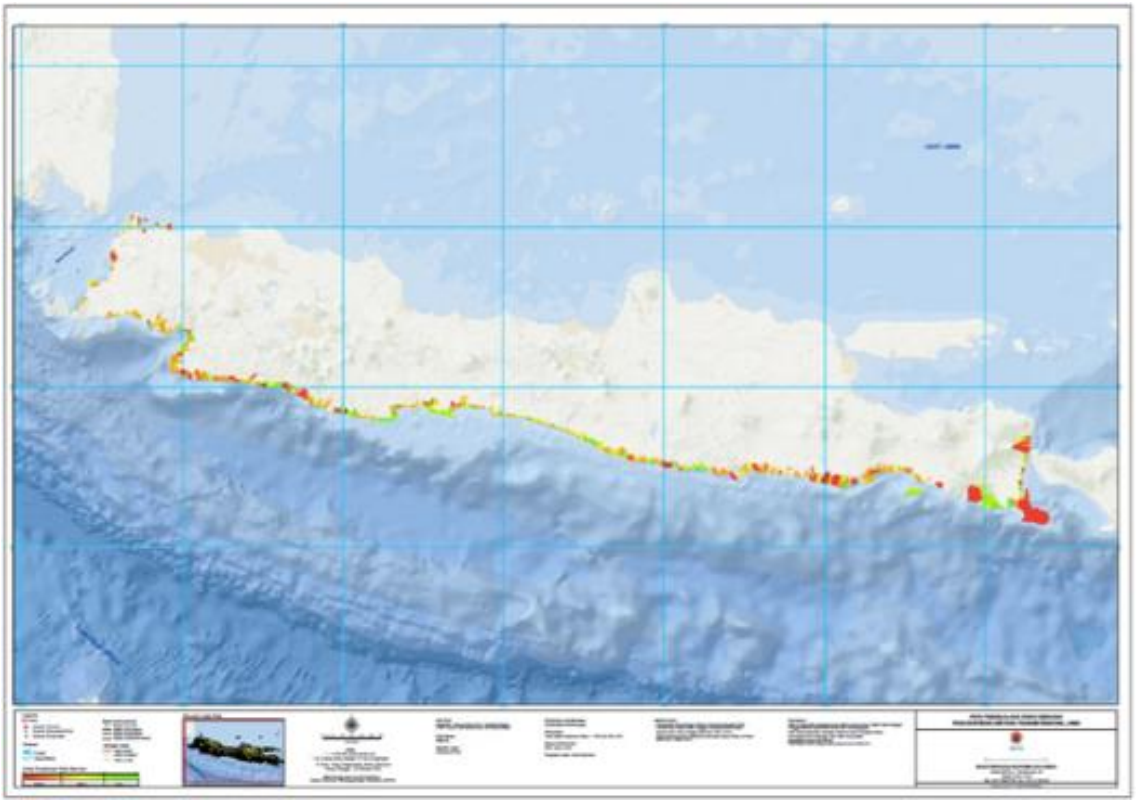

Fig. 3 Resilience map of risk management component.

3.5 Component Analysis 4: Emergency Preparedness

The Emergency Preparedness Component assesses the ability of villages to deal with emergencies. A variety of village preparedness, starting from the detection process, the ability to save villagers from disasters to the availability of village disaster management volunteers to help villagers through the crisis. The ability of villages to be prepared in the face of disaster emergencies is a basic capacity that must be owned by villages, when disaster risk management has not been optimally implemented. This component has 8 indicators:

1) The availability of mechanisms for early detection of possible disasters at the village level.
2) Availability of mechanism for receiving early warning and/or evacuation orders.
3) The functioning of the mechanism for spreading evacuation directives that are easily

accessible and understood by all parties including vulnerable groups.

4) Availability of community evacuation plan maps that can be used before and at the time of a disaster.
5) Evacuation site.
6) Evacuation routes and signs.
7) Periodic and ongoing disaster preparedness training at the village level.
8) Availability of volunteers for disaster management in villages or villages that have the ability to handle disaster emergencies.

The Village Resilience Assessment during the 2019 DESTANA Tsunami Expedition shows that this component has a fairly low average component of 0.484 (Fig. 4).

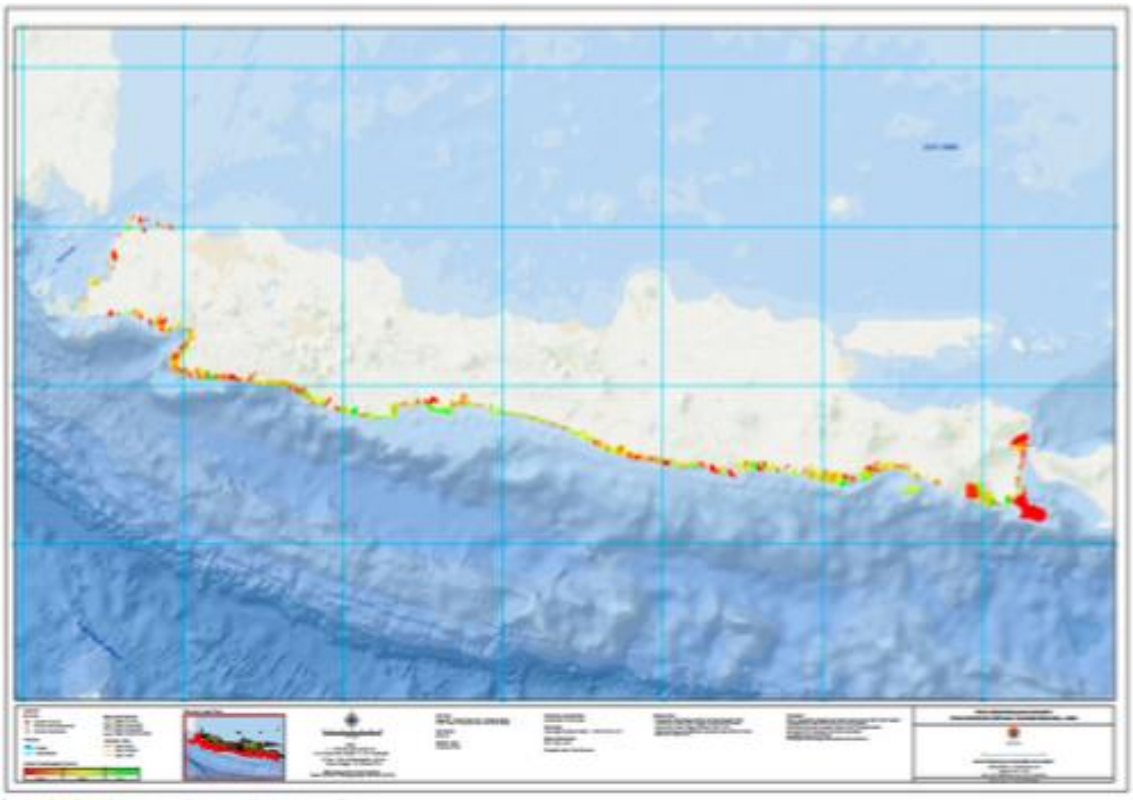

Fig. 4 Resilience map of emergency resilience component.

3.6 Component Analysis 5: Recovery Preparedness

Recovery preparedness is the final component of the village resilience assessment. The Assessment Components of Recovery Preparedness aim to see the village's readiness in dealing with the recovery situation after a disaster has occurred. Mechanisms and planning to deal with this situation are the focus of assessment indicators. There are 2 indicators of the Recovery Preparedness Component assessment:

1) The availability of various mechanisms aimed at early disaster recovery efforts at the village level
2) The availability of sustainable recovery planning for various strategic assets and strategic properties of the village that are at high risk of being damaged by disasters.

The overall assessment shows that the Yogyakarta Province has the highest average village scores compared to other provinces, except for this component. In the Recovery Preparedness Component,

West Java Province has the highest average village score (Fig. 5).

3.7 Maps of the Resilience Village of Destana Tsunami Expedition Village 2019

Assessing resilience village in managing disaster risk and anticipating the possibility of a disaster coming is the first step to increasing existing resilience. From this assessment, action plans can be drawn up to improve village’s resilience. The plan is realised in a comprehensive and sustainable manner with strong commitment and independent resources from its community.

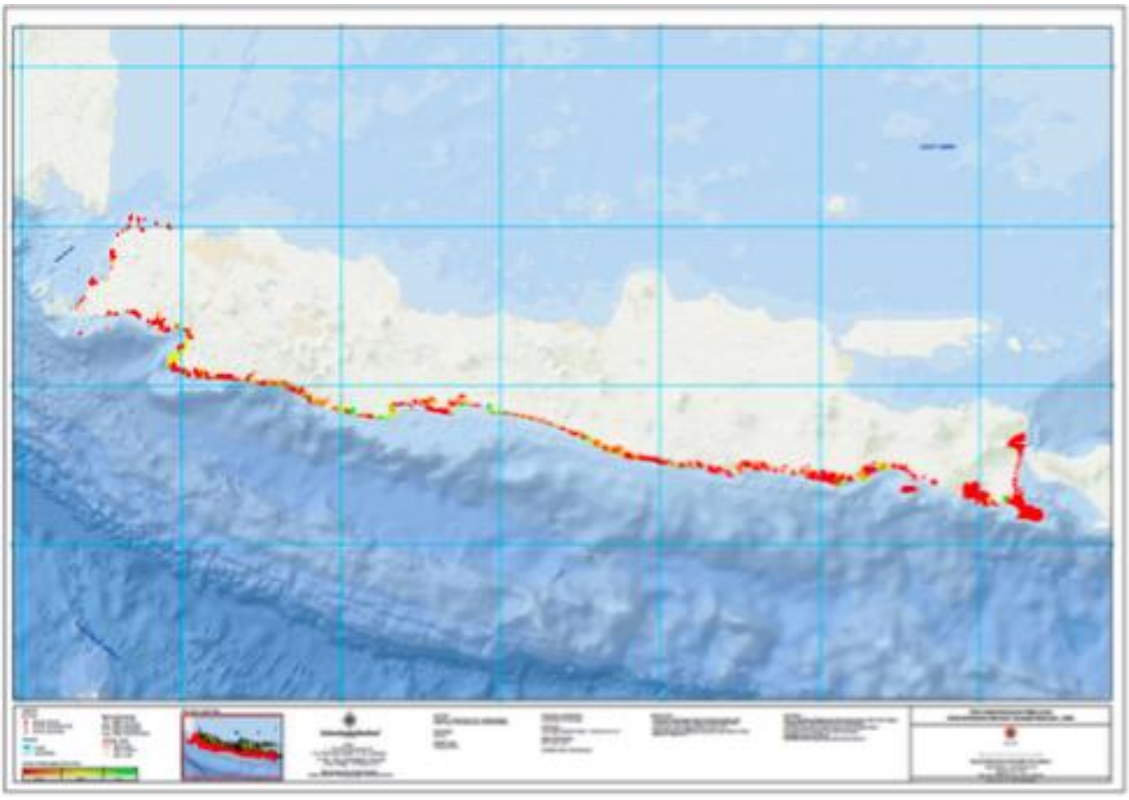

Fig. 5 Resilience map of preparedness component.

Based on the description of the 5 components of the previous assessment, the level of village resilience can be analysed in this expedition. Overall, the results shows that villages through this expedition are at the Pratama Disaster Resilience level. The highest average resilience component is the Basic Service Quality and Access Components. The second highest component is the Disaster Risk Management Component.

On a provincial scale, Yogyakarta and Central Java Provinces are provinces with average resilience village values at the level of Madya Disaster Resilience. The assessment shows that there are 27 villages that are at Utama Disaster Resilience level. Provinces with the villages that have the most major Disaster Resilience levels are West Java and East Java. Uniquely, the DI Yogyakarta Province which has the highest average provincial value, has only one Disaster Resilience village. This indicates that in general, villages assessed in the Special Region of Yogyakarta Province are at the level of Madya Disaster Resilience (Fig. 6).

4. Conclusion

Based on various analyses, recommendations could be made on the provincial scale strategic plan to improve the village resilience level.

Fig. 6 Village resilience map from the destana tsunami expedition 2019.

1) All provinces in Java need to immediately encourage districts/cities together with the sub-district and village governments to develop an integrated system and mechanism to manage post-disaster village recovery.
2) Banten, West Java, and Central Java Provinces encourage increased resilience to the Basic Components of the Disaster Management System by preparing a regulatory, institutional, planning and partnership network framework to support disaster management actions that have been carried out in villages.
3) DI Yogyakarta and East Java Provinces encourage increased resilience in the Emergency Preparedness Component by preparing early warning facilities, periodic training and consistently increasing volunteer capacity.

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