A new decade for social changes
Lessons Learned from Japan for Disaster Risk Reduction to Build Disaster Resilience and Sustainable Communities During and Post-Covid-19 Pandemic

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Abstract. Geologically, Indonesia and Japan have something in common, namely that they are crossed by the Eurasian and Pacific tectonic plate paths. According to data from the United States Geological Survey (USGS), Japan and Indonesia are the country most frequently experiencing disasters. What distinguishes Indonesia and Japan is the disaster management, both disaster management technology and the mitigation actions taken. Disaster management is one of the issues raised in the sustainable development goals. In every disaster that occurs, it is also hoped that the community/country will quickly recover and rise again in repairing the damage caused by the disaster. In this case, community resilience is a fundamental thing that must be done by all countries to ensure that every citizen can cope, anticipate, and can also recover after a disaster occurs. The aim of this study is to analyze disaster risk reduction and community resilience to disasters to continue development during the pandemic and after the pandemic: Lesson learned from Japan. This research data analysis uses qualitative data analysis techniques Miles, Huberman and Saldana. This data analysis technique consists of three components, namely data condensation, data presentation, and conclusion/verification withdrawal. The research results from the lessons learned that can be taken for Indonesia are: disaster risk reduction in Japan is carried out by utilizing innovative disaster mitigation technology and advanced early warning systems, public awareness of high disaster risk reduction, and Government policies that can encourage research and investment in technology development to reduce disaster risk and increase community resilience in the face of disasters.

Keywords. Lessons Learned, Disaster Risk Reduction, Resilience, Sustainable Communities.

1. Introduction

Japan is a developed country located in East Asia both in terms of science and technology. An important factor that makes Japan a developed country is the human resources in the country. When viewed from history, Japan was destroyed in the second world war which
destroyed the cities of Hiroshima and Nagasaki. From a geological point of view, Indonesia and Japan have something in common, namely that they are crossed by the Eurasian and Pacific tectonic plate paths. According to data from the United States Geological Survey (USGS), Japan and Indonesia are the countries most frequently experiencing disasters. The thing that distinguishes Indonesia and Japan is the disaster management system, both the disaster management technology it has and the mitigation actions taken.

Disaster management is an unavoidable development challenge and one of the issues raised in the Sustainable Development Goals (SDGs). With the focus on disaster management, it is hoped that the risk of disasters in various regions can be suppressed and minimized. The definition of the concept of sustainable development itself is ensuring dignified living conditions related to human rights by creating and maintaining a wide range of alternative access in planning a lifestyle [1]. The principle of justice between present and future generations must be taken into account in the use of environmental, economic, and social resources. Comprehensive protection measures for biodiversity and genetic diversity should also be considered. In principle, sustainable development is a process of continuous change in it, various activities such as resource exploitation, investment direction, technological development orientation, and institutional change are on a path that is in harmony with increasing present and future potential in fulfilling human needs and aspirations. The goals of economic and social development as well as resilience in the face of disasters must be pursued sustainably [1].

The development after the disaster is a capacity owned by both the community and the central and regional governments. However, most of the ability to survive and save themselves from disasters is the efforts made by the local community/around the disaster [2]. In every disaster, it is necessary to reduce disaster risk with the main aim of reducing the impact arising from the disaster. Disaster Risk Reduction (DRR) according to UNISDR published in 2009 defined DRR as the concept and practice of reducing disaster risk through systematic efforts to analyze and manage the causal factors of disasters including reducing exposure to threats, reducing human and property vulnerabilities, land management and environmentally wise, as well as increasing preparedness for adverse events. To be able to implement DRR, it must be supported by the main components which include: 1) Awareness of and risk assessment; 2) Development of knowledge in the form of education, training, research, and information; 3) Increased commitment to policies and institutional frameworks, including the community; 4) Environmental management, land use, urban planning, protection of critical facilities, application of science and technology, partnerships and networks, financial instruments; and 5) Good use of EWS [3].

In every disaster, it is also hoped that the community/country will quickly recover and rise again in repairing the damage caused by the disaster. For this reason, community resilience is a fundamental thing that must be done by all countries to ensure that every citizen can cope, anticipate and also be able to recover after a disaster [4]. Community resilience to disasters is the ability to manage disasters, through the adaptation process, and maintain basic functions in society that determine the sustainability of life, as well as the ability to recover to its original state [5]. Community resilience to disasters can be seen from the following indicators: (a) Community capacity that can reduce the impact on risk/damage through mitigation or adaptation; (b) Capacity to maintain self-recovery function after a disaster event. This includes the resilience/resilience created by the community's capacity and character that supports community resilience [5]. Reflecting on 2015, almost all countries in the world agreed to be more serious in reducing disaster risk, where the agreement was contained in the Sendai
Framework for Action 2015-2030. Disasters must be reduced in risk include disasters due to climate, disasters due to geology, disasters caused by diseases that become epidemics, and pandemics [4].

The importance of increasing community resilience is stated in the book Sustainable Development Goals (SDGs) which was adopted by the United Nations in September 2015 as a reference basis for the whole world. Its driving principle is to bring about peace and prosperity for all people and the planet by responding to challenges with an inclusiveness that “leaves no one behind”. The Japanese government has made the Guiding Principles for the Implementation of Sustainable Development Goals (SDGs) in the fields of science, technology, and innovation (STI) and provided recommendations such as creating a global future through society, enabling solutions using data globally, promoting collaboration at the global level and fostering human resources to make efforts in the fields of science, technology, and innovation [6].

Referring to the condition of the world in the last two years, we have observed together that the movement of people's lives around the world was momentarily stalled during a non-natural disaster in the form of the COVID-19 pandemic. After the World Health Organization (WHO) declared COVID-19 as a pandemic starting March 9, 2020, governments in each country are working hard to suppress the spread and impact of the damage caused by the virus [7]. However, the speed of the spread of the covid-19 virus remains difficult to contain, causing more than 500 million positive cases of covid-19 and the death of more than 6 million people in early June 2022 [8]. As with epidemics that have hit the world before, after the peak point of the spread is reached, the COVID-19 pandemic will gradually subside. This can be seen in the increase in the number of cases in early June 2022 which was not as sharp as before. In addition, the number of deaths due to COVID-19 has also decreased significantly.

One month running in early 2021, a series of natural disasters hit Indonesia and claimed hundreds of lives. Starting from earthquakes, floods, tidal waves, and landslides, to volcanic eruptions. During the COVID-19 pandemic, disasters will be felt more heavily by the community. Currently, the Covid-19 pandemic has indeed subsided, but that does not mean there is no threat from other types of hazards that can cause disaster. Therefore, Indonesia must remain alert to various disaster threats. This can be reflected in Japan's success in dealing with COVID-19 and other disasters to reduce the risk of COVID-19 and create a society that has resilience to COVID-19 continuously and can continue community development and even provide resilience in improving their welfare. Community resilience in dealing with disasters can contribute to these aspects of sustainable development. For this reason, this study aims to analyze disaster risk reduction and community resilience in dealing with disasters to continue development during the pandemic and after the pandemic: Lesson learned from Japan.

2. Research Method

This research data analysis uses qualitative data analysis techniques Miles, Huberman and Saldana [19]. This data analysis technique consists of three components, namely data condensation, data presentation, and conclusion/verification withdrawal. The study consisted of how many stages of work were carried out to identify and analyze the theme of "Disaster Risk Management to Build Resilience and Sustainability". The first stage of this research is to identify the research area and disaster risk so that the characteristics of Japan can be determined against the existence of multiple disasters such as earthquakes, tsunamis, and floods.

Furthermore, the theme was analyzed by collecting data using the In-Depth Interview and Focus Group Discussion (FGD) methods as primary data. Secondary data in the form of documents obtained from data, annual reports, maps, photos, legislation, and other data
Repositories related to the research theme. In addition, data were obtained by attending work abroad courses and requesting data from the International Center for Water Hazard and Risk Management (ICARM), Japan; and the National Research Institute for Earth Science and Disaster Resilience (NIED), Japan.

The validity of the data used in this study is a triangulation of data sources. Triangulation is an attempt to take different data sources, in different ways to obtain clarity about a particular matter. Data taken from different sources can be used to build a coherent justification for themes and will increase the validity of the study [9]. In this study, various sources of data were obtained by conducting Focus Group Discussions and interviews with subjects who were disaster stakeholders and academics as well as collecting documents as well as audio and visual materials.

3. Result and Discussion
3.1 Disaster overview and disaster information system in Japan

Japan is a country that is at risk for natural disasters such as earthquakes that even trigger tsunamis, floods, and volcanic eruptions that require government action to save disaster victims, establish temporary evacuation sites, provide assistance, and collect all needed information. This information is used as a basic decision-making. When a disaster occurs, there is no way to avoid it. The government's efforts to deal with disasters are through a series of disaster risk reduction activities [10]. Japan also said “The World Leader” in terms of disaster preparedness. Every year since 1960 Japan has observed Disaster Preparedness Day on September 1, to remind the public of the 1923 Tokyo earthquake that occurred on that date. In fact, at some schools in Japan, the celebration of the first day of class begins with evacuation drills.

The social construction prevailing in Japan makes them as the forefront of disaster risk reduction. Japan's geographical conditions that put it at high risk of danger bring a different perspective to its people, where risk is also seen as an opportunity (in Japanese kanji writing, "crisis" consists of two elements, namely "danger" and "opportunity"). This is evidenced that over the last 50 years or so, Japan has succeeded in reducing the number of damage and casualties due to disasters (except for extraordinary disasters such as the 2011 Tohoku earthquake and tsunami). Based on this perspective, the concept of disaster risk reduction is not only as an effort to reduce casualties but also to protect the country's economic sustainability and as a means of diplomacy to show its strength in the field of disaster in the international community. Therefore, the disaster aspect has been a priority in Japan's foreign relations agenda, which shows that Japan is a world leader in disaster risk management. This can be seen in the international disaster forums have been held in Japan for the past three decades, namely: Yokohama Strategy and Plans for Action, Hyogo Framework for Action 2005-2015, and Sendai Framework for Disaster Risk Reduction 2015-2030.

Due to the 2011 earthquake and tsunami in Japan, the Japanese Government using the Geographic Information System to help save and secure the community while natural disasters occurs. In the Sendai Framework, there are four priority actions in disaster risk reduction. The National Research Institute for Earth Science and Disaster Resilience (NIED) contributes at the first priority action, namely NIED since conducts research to produce information that can be used in disaster risk reduction. NIED conducting a comprehensive basic fundamental study and fundamental research and development to improving science and technology for disaster risk reduction. NIED's goal is maximize research and develop the results of research that has been done improve disaster resilience.
NIED conducts a lot of research in its four research centers. The NIED observation network that observes seismic, tsunami, volcanic, and meteorological activity consists of approximately 2,200 observation stations installed throughout Japan. For example, NIED observation networks: Hi-net (Hi-net is an observation network consisting of high-sensitivity seismographs installed at the bottom of boreholes to detect weak seismic signals from micro-earthquakes); Kik-net (Kik-net is a network of seismographs with strong motion. Installed at ground level and in the same boreholes as Hi-net. Data from Hi-net and Kik-net are also sent to JMA and used for Early Warning System); K-NET (K-net is a network of powerful motion seismographs that accurately observe seismic motions that are strong enough to cause significant damage. K-nets can precisely record strong seismic motions of up to thousands of accelerations); F-NET (The f-net broadband seismograph can record ground motion over a wide frequency range, forming fast to very slow oscillations. Using such a seismograph, we can analyze the source mechanisms and source processes of major earthquakes around the world); V-net (V-net is a volcano observation network that can monitor volcanic activity such as volcanic-earthquakes, crustal movements, and volcanic eruptions); S-net and DONET. tones in the Nankai Trench and Kii channel); MP Radar (MP (Multi-Parameter) Radar allows accurate rainfall estimation by transmitting and receiving polarized radio waves. The developed technology is transferred to the MLIT (XRAIN) radar network); and Snow and weather monitoring network.

The information obtained from the observation networks used for an early warning system which is to understand the actual hazard conditions in real-time through MOWLAS, helps to carry out appropriate disaster response actions. Apart from being collected in data centers, observational data is published and widely shared through websites, the information
can be accessed by anyone. One example “Kyoshin Monitor” (strong motion monitor) visualizes and live streams all seismic activity in the Japanese archipelago.

Japan has a history of floods because of tsunami in the past, such as Typhoon Kathleen hit Tokyo in 1947. Typhoon Kathleen destroying 31,000 homes and killed 1,100 people. Ten years later, Typhoon Kanogawa submerge streets, houses, shops and offices, up to 400mm rainfall for a week. On July 2, 1969, flood in the Kyushu area causing 35 people dead and 7 missing. On July 11, 1972, reported that 24 people died due to flood in Shimane and Hiroshima. Four years later, September 12, 1976, 70 people were reported died due to flood in western Japan. Disasters still happening until July 23-24, 1982, heavy rains and flood on the island of Kyushu, southern Japan lead to 94 people dead, 139 people missing, and 125 others buried in mud. Meanwhile, in Nagasaki, floods causing 10,000 houses flooding, cut off electricity and water in 47,000 homes in the disaster area.

Conditions Japan with the geographical area, which is almost 70% mountainous areas with steep river flows and short distances to the sea, require Japan to deal with flood when heavy rainfall occurs. The highly rainfall in Japan caused by the "Taifu or typhoon" and global warming recently, which causes climate instability in Japan and all countries on this earth. The factors causing flood in Japan are different with Indonesia because floods in Japan generally occur by overflowing of water from rivers due to high rainfall. In other words, the floods in Japan is not due to the failure of the Japanese government and society in maintaining, managing and conserving the environment, but rather its natural condition.

To overcome the problem of flooding in Japan, especially in Tokyo, the G-Cans project was formed. G-Cans is an underground water storage canal in Kasukabe Tokyo, which is 25.4 meters away, or the equivalent of a six-story building. The flood canal of the G-Cans project has dozens of cylindrical towers as high as 70 meters and has five G-Cans cylinder chambers, each of which is rumored to be able to hold up to 13 million gallons of water. In addition, the drainage system is also Japan's solution to flooding. Sakura Country has a Metropolitan Area Outer Underground Discharge Channel (MAOUDC). MAOUDC is a system of tunnels 6.3 km long and towering cylindrical chambers that protects northern Tokyo from floodings.

![Figure 2. MAOUDC in Japan. (Reuters)](image-url)

The Japanese floods handling is carried out through the Virtual Floods Experiences System which was built by the International Center for Water Hazard and Risk Management
(ICHARM) Team. This system serves model the occurrence of floods in which the distribution of flood-affected areas can be mapped, flood height predictions, and in the future it is targeted to predict how the impact of floods on human activities [11].

3.2 Case Study Disasters during the covid-19 outbreak in Japan

COVID-19 is a threat to everyone in the world, including Japan. Japan's geographical location, which is not far from China, makes Japan a country that has more action. Moreover, if a disaster also occurs during this COVID-19 quarantine period, it will be a very big threat. But it can't be avoided, so the Japanese government is also trying to find new steps or ways to evacuate by applying to avoid the following conditions:

a. Closed space with poor ventilation;

b. Busy place with lots of people nearby;

c. Close contact settings such as close-range conversations.

To carry out disaster evacuation and sheltering in the COVID-19 situation, several components are needed to support, such as what kind of information should be available, how refugees can avoid transmission, what is the best map that can be used to make it easy to understand. One of them is the system used by NIED. The systems that NIED builds and uses during disasters are as follows:

a. SIP4D (Shared Information Platform for Disaster Management): SIP4D is an information sharing platform that collects disaster related data from various sources and distributes it as "ready-to-use" information to disaster response organizations or agencies. SIP4D share information in real time and across ministries.

b. ISUT-site (Information Support Team-site): The Cabinet Office launched a pilot of the “Information Support Team (ISUT)” in April 2018. ISUT aims to support the provision of disaster information for disaster-affected local governments in the event of a severe disaster. NIED is a core member of ISUT, specifically supporting the mapping of disaster information using SIP4D. ISUT can be used for major disasters and makes remarkable results in the field of disaster information management. Since ISUT demonstrated its effectiveness during trials, ISUT began full operation in April 2019. ISUT provides disaster information mapping products through ISUT-SITE which is only open to disaster response organizations. ISUT-SITE is based on the same technology from NIED-CRS.

c. Bosai X View: Bosai X View is an “open” disaster mapping service that collects a wide range of open disaster data across multiple sources. Bosai X View is one of the public “End Points” of SIP4D. Japan has also experienced natural disasters during the COVID-19 pandemic. For example, Kumamoto and Kagoshima Prefectures in southern Japan experienced record-breaking heavy rains on July 4, 2020. The rains caused by devastating floods and landslides in many areas, killing 83 people, and destroying 15,335 buildings according to the Fire and Disaster Management Agency. Sixty-five people died in Kumamoto Prefecture alone. Kumamoto is a prefecture that was hit by a devastating 7.0 magnitude earthquake in 2016, which according to an experienced volunteer who answered during an interview, prepared the prefecture in many aspects of disaster management compared to some other parts of Japan [12].

The July 2020 floods present a number of new challenges as the fight against the pandemic continues. The first severe COVID-19 positive patient was confirmed in Kumamoto Prefecture on February 21, 2020. Prior to the heavy rain disaster on July 4, 2020, no positive patients were identified in municipalities in the southern region of Kumamoto Prefecture, such as Hitoyoshi and Yatsushiro, which were hit by heavy rains. Interview surveys of residents’
actions in the immediate aftermath of a disaster revealed a low level of awareness of infectious diseases in the early stages of public shelters when people were evacuated to temples, public halls, and elementary school gymnasiums. [12].

While many countries were impacted by various hazards and forced to take extra measures and efforts to deal with different types of hazards simultaneously, some cases like the Kumamoto flood did not cause a spike in COVID-19 cases, even after they occurred. Through massive evacuation measures. The Cabinet Office and the Fire and Disaster Management Agency (FDMA) in Japan jointly announced the general principle in evacuation that “people in dangerous places should be evacuated in the event of a disaster, and this principle applies during the ongoing COVID-19 pandemic”. The announcements and recommendations were made explicitly to prevent people from avoiding evacuation due to pandemic-related fears. At the same time, people are advised and encouraged to evacuate a place of relatives and acquaintances other than a general shelter, or choose a place that is unlikely to flood, sleep in a parked car in a safe place, and even move to a safe place, upstairs in the house. This method is referred to as “scattered evacuation” [12].

3.3 Japan’s Efforts in Improving Resilience and Sustainable Communities

The American Psychological Association (APA) [13] defines resilience as a process of good adaptation in dealing with adversity, trauma, tragedy, threats, or significant sources of stress such as family problems, relationships, serious health, or problems at work and financial stress. The resilience is the ability to return its original state from the pressures or difficult circumstances faced. Resilience is considered as the capacity to self-heal or bounce back from difficult situations. Resilience is often described as the capacity that individuals have in dealing with pressure or the impact of difficult circumstances to recover and return their original state.

The Japanese community with the challenge of the frequency of disaster occurrences that are quite frequent in their country, creates a form of community resilience to disasters. In addition to increasing capacity in the field of infrastructure and disaster knowledge of its people, Japan also increases their resilience by utilizing advanced technology and society. NIED also helps improve community resilience with the information provided. Increasing community resilience can be done if the community has knowledge about the risks of threats or disaster hazards that exist in their area.

NIED conducts comprehensive basic studies and fundamental research and development to improve science and technology for disaster risk reduction. The threat or danger of natural disasters is predictable. The importance of information held by the community is one way to increase the capacity or capacity of the community for disaster risk reduction. The important things is not to approach disaster as a separate form, but rather to take a comprehensive approach based on the concept of “resilience” to deal with disasters resiliently in society.

NIED also promotes diverse research with the basic objective of “creating a society that is resilient to natural disasters by leveraging science and technology for disaster risk reduction”. Disaster risk reduction science and technology referred to here means understanding and predicting precisely what will happen, preventing disasters early, stopping the damage that falls, and realizing disaster recovery and rehabilitation [14].

Community resilience can be seen with several indicators such as governance, risk assessment, risk knowledge and education, risk management and risk reduction, and disaster preparedness and response [15]. When viewed from the research conducted by NIED regarding the threat or danger of disaster, the information that can be accessed by public can be used as
knowledge about the disaster risks in each mapping location. If the community already has sufficient knowledge about risk, one of the indicators of community resilience can be implemented and community resilience will increase.

As progress through innovations in science and technology are very remarkable, dramatic increases in computing power. In 2016, an initiative called “Society 5.0” or “Society 5.0” was proposed by the Cabinet of Japan in its 5th Science and Technology Basic Plan, with the vision to create a “Super Intelligent Society” (MSC). MSC is positioned as the fifth stage of development in human society, after hunter/gatherer, agrarian, industrial, and information societies. MSC represents a sustainable society connected by digital technology that is present in detail with the various needs of that society. It should be underlined that digitalization is only a means, and that we humans as the main actors remain important so that a strong focus is maintained on building a society that makes us happy and gives us a sense of value. The Japanese government presented its vision of Society 5.0, along with exhibitions by supporting companies from Japan, at CeBIT 2017, the European business festival for innovation and digitization covering the digitization of business, government and society from all angles.

Society 5.0 focuses on capacity building and its relationship with technology and all aspects of life, placing the community at the core of the entire focus of development that occurs. On this concept, the Community 5.0/SDG is implementing key for stakeholders to share and overcome common challenges by fully exploiting the potential of CPS. To move towards greater human security and well-being, we need to transform through a collaborative ecosystem with a shared vision for a future, created by the participation of all stakeholders.

Resilience in disasters of Japanese society is quite well known, where this country has a very effective disaster response management, so that it is always fast in handling victims. The response from the Japanese government together with all elements of society is generally very fast in dealing with post-disaster situations, carrying out restoration of disaster-affected areas, as well as overcoming health problems and the lives of survivors [16].

In the perspective of the community 5.0, the resilience of the community is built in line with the objectives in the point of sustainable development. Japan in building the people resilience to disaster resilience, adopts various disaster and sustainable development documents, such as SFDRR, point 13 of the SDGs, namely developing and utilizing the earth observation big data system, point 11 yaksi sustainable cities and communities through contributing to disaster prevention and mitigation in coastal areas by utilizing tsunami wave monitoring, as well as various other efforts to increase disaster resilience.

3.4 Lesson-learned for Indonesia

The Prihatin study states that in densely populated areas that are classified as disaster-prone and most of them show that the majority of people are not ready to face natural disasters. In fact, the awareness that they live in areas prone to natural disasters is still low. This low awareness is influenced by the perspective of most people in assessing natural disasters. People tend to surrender and accept what nature has given them. People tend to see natural disasters as unavoidable destiny [16].

In the case of the Mentawai Tsunami, villages were located too close to the sea, so the tsunami washed away houses located near the sea, which were generally of wooden construction, with few reinforced concrete or steel buildings. Multi-layer protection systems against tsunamis are also inadequate. One form of defense that can be seen is the coastal forest, however the forest is not large enough to provide much protection to the villages behind it [17].

The different Mentawai Government with the Japanese government are continues about
various kinds of tsunami countermeasures (including elements from all levels) to anticipate the event. The action taken by the Japanese government shows that the level of tsunami awareness is high at the institutional level. Examples of mitigation efforts is offshore breakwaters and tsunami walls along the northern part of the coastline and coastal embankments. In addition, good spatial utilization, such as the location of schools and hospitals which are located on higher ground, so that they are not affected or affected [17].

Furthermore, community empowerment in helping to deal with disasters is also better when compared to Indonesia. Communities in Japan actively participate in assisting local governments in carrying out disaster management. This is of course inversely proportional to the situation in Indonesia, where people tend to be passive when a disaster occurs. It is this difference in perspective that ultimately makes development in Japan always oriented towards disaster risk reduction so that Japan is said to be a leader in disaster risk management because of its activities in:

1. Development Of Research In The Field Of Disaster; Based on data from Elsevier, Japan is the most active country in producing research in the field of disaster at the international level. This level of activity is still very far from Indonesia. In fact, Indonesia is considered more at risk if it experiences danger in terms of the number of fatalities. Furthermore, when compared to developed countries such as the United States and China, Japan still excels in producing the necessary knowledge for disaster risk management. Researchers in Japan are not only active in researching disasters in their own country but also in researching disasters in other countries. However, they ensure that all the results of this research are produced domestically to protect the interests of their country.

2. Social and Political Conditions; Second, Japan's social and political conditions are conducive so that policies related to disaster risk management can continue to be developed in accordance with the dynamics that occur. Every time Japan experiences a large-scale disaster, it is likely that the Law will also be revised based on the experience of the disaster. The development of policies related to disasters will also spur all stakeholders including business actors, academics, and the general public to implement safer development that is oriented towards disaster risk reduction. Although in Japan the decision-making process such as drafting laws is relatively slower when compared to other countries that have presidential systems, this is what makes a law in Japan when it is passed can encourage changes in all sectors. Thus, all stakeholders will focus their investment in the form of money, time and human resources to carry out the mandate of the Act. This may also distinguish it from a country that has a presidential government system where political conditions are very dynamic because it follows the policies of the head of state in power at that time and there is no guarantee that a policy will continue if the head of state changes. In Japan, regardless of who is the head of state or who has political power, disaster risk reduction is always a priority on the political and diplomatic agenda.
3. The Role of The Private Sector in Disaster Risk Reduction Technology: Third, the involvement of the private sector in Japan is very influential in disaster risk reduction. For Japanese companies in normal conditions (not during a disaster emergency), disaster can be seen as an opportunity to create profit. The companies in Japan especially those engaged in science, technology engineering and information systems can create a market in the disaster sector. In the end, the existence of this market will also increase economic income in Japan. This can be seen from the existence of an organization called the Japan Bosai Platform (JBP). JBP is an association of Japanese private companies that offers 'bosai' solutions. The term 'bosai' in Japanese can be interpreted as 'disaster risk reduction'. To that end, the mission of JBP is to increase community resilience to disasters and sustainable development through the provision of infrastructure and technology. JBP is also a gathering place for industry players, academics and government engaged in sectors related to disaster risk reduction to gather and share information. For this reason, it can be concluded that in Japan "development equals disaster risk reduction" given that all aspects of development are integrated with technology that supports disaster risk reduction.

4. Financial Ability: Fourth, the factor of financial resources for disaster risk reduction is getting more attention from the Japanese government. Japan allocates a sizeable budget for programs that can support disaster risk reduction. For example, in the early 90s, Japan focused on land conservation programs on disaster-prone lands such as riverbanks so that these areas were guarded so as not to develop human settlements. With this strategy, the community is completely kept away from the source of the disaster. After the focus of the budgeting to keep people away from disaster risk was completed, it was only in the second decade of the 2000s that the budget related to disaster reconstruction could be focused. Furthermore, strategic infrastructure development in Japan also gets a large budget allocation considering that safe infrastructure development does require quite expensive investment. For example, for the construction of the Shinkansen high-speed train, the risk is borne by the government 100% and it is also equipped with a sophisticated early warning system. In Japan, disaster insurance and early warning systems aim not only to protect public safety but also to protect economic sustainability and strategic infrastructure.
The effort to complex challenges respond in present and future, the collaboration Japanese government with the private sector has formulated a new comprehensive strategy, named Society 5.0. Society 5.0 leverages a number of diverse technological innovation solutions and achieves safer and more sustainable economic and community development. Society 5.0 aims to create a human-centered society that deeply integrates cyberspace and physical space in the domains of manufacturing, mobility, healthcare, agriculture, energy, and disaster prevention. Society 5.0 planning the leverage technology continue to predict earthquakes, tsunamis, and climate change accurately and at an earlier stage, so as to respond more efficiently when disasters occur. This new strategy is also expected to assist in developing sustainable adaptation policies that connect stakeholders and communities and ensure a better cycle of use and service of resources. The Japanese government plans create a 'super smart' country [18].

4. Conclusion

Based on research that has been conducted on lessons learned from Japan for disaster risk reduction to build disaster resilience and sustainable communities during and post-covid-19 pandemic, can be concluded that disaster risk reduction in Japan is carried out by utilizing innovative disaster mitigation technology and advanced early warning systems. In addition, public awareness of disaster risk reduction is high. For this reason, in Indonesia there must be a shift in the mindset of disasters, especially for its leaders and also the people. Disasters should be seen as opportunities that everyone including governments, scientists, civil society, and the private sector should be a part of. The government should also make policies which can encourage research and investment in technology development for disaster risk reduction and increase community resilience in the face of disasters.

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