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Indonesian Disaster Governance: Public Policy and Social Economic Impact

Hasbullah, Faculty of Social Science and Political Science, Universitas Tadulako,Jl. Soekarno Hatta No.KM. 9, Tondo, Mantikulore, Palu, Central Sulawesi 94148, Indonesia, hasbullahtadulako@gmail.com
Muhammad Ahsan Samad, Faculty of Social Science and Political Science, Universitas Tadulako,Jl. Soekarno Hatta No.KM. 9, Tondo, Mantikulore, Palu, Central Sulawesi 94148, Indonesia
Muhammad Nur Ali, Faculty of Social Science and Political Science, Universitas Tadulako,Jl. Soekarno Hatta No.KM. 9, Tondo, Mantikulore, Palu, Central Sulawesi 94148, Indonesia
Maddukelleng, Faculty of Social Science and Political Science, Universitas Tadulako,Jl. Soekarno Hatta No.KM. 9, Tondo, Mantikulore, Palu, Central Sulawesi 94148, Indonesia
Muhammad Khairil, Faculty of Social Science and Political Science, Universitas Tadulako,Jl. Soekarno Hatta No.KM. 9, Tondo, Mantikulore, Palu, Central Sulawesi 94148, Indonesia

Abstract- This study discussed disaster governance-related public policies and described the socio-economic effects of the post-28 September 2018 disaster in Palu, Central Sulawesi, Indonesia. This study also examines the involvement of NGOs in the post-disaster recovery process.This study was based on a qualitative method with case studies approach which also examines literature studies and latest data that sourced from various explorative social elements. Primary data were obtained through interviews and Focus Group Discussions (FGD). Secondary data were obtained from various studies such as scientific journals and online news media sources, both local and national. Primary data and secondary data were processed using the triangulation method. The obtained data were grouped and reduced to obtain more accurate results. Data validation is carried out by free interviews with key informants.The results showed that the main tasks and functions overlap between government agencies in disaster management were found. Post-disaster reconstruction process showed the program time-frame, infrastructure improvements, social, economic conditions, and national and regional government policies. Socio-economic recovery was carried out two to four months after the disaster. However, the process of reconstruction and physical or infrastructure rehabilitation resulted in an economic and psychological conflict. The infrastructure recovery programs planning and realization process did not involve the survivors, thus social disparities arise. The national government has prepared several economic instruments to restore the impacted area.This study can be utilized by regional governments of disaster-prone areas in Indonesia to provide initial policies before disasters occur. This study can also be used by social science academics who are interested in disaster governance studies.From our research and examinations, there are very few studies related to disaster government in disaster-prone areas in Indonesia. Dominant research is still related to post-disaster geological conditions. This research is to fill that gap.

Keywords: Disaster governance, Hazard, Indonesian disaster, Risk Governance

I. INTRODUCTION

Studies regarding disasters have been widely researched by researchers and academics. However, the number of disaster studies that focus on governance is few in numbers (Tierney, 2012). Most research is focused more on management, legislative processes and risk reduction programs (Ashu & Van Niekerk, 2019).

This study begins by describing state institutions of Indonesia which specifically handle with disaster issues. Furthermore, this study will also discuss government rules and regulations related to disaster management. Then it will continue to discuss post-disaster community conditions. The condition of post-disaster settlements is one of the highlights of this research which also include the economic condition of the residents as well as problems that occurred one year after the disaster occurred.

This study raises a problem that occurred after the natural disasters which struck at 28th September 2018 in Palu, Central Sulawesi, Indonesia. The construction of temporary and permanent settlements is one of the main priorities of the post-disaster reconstruction process, after which the improvement of supporting infrastructure is also the target for further development. Suitable and nonsuitable area zoning for settlement is also regulated in regional government regulations. One of the obstacles in the post-disaster recovery process for the government is the reluctancy of people within the community to follow government regulations. The community has started to build their settlements on the rubble of their houses which affected by natural disasters, whereas the regional government has not finalized zoning rules and regulations regarding residential and nonresidential areas.

The term disaster governance is not yet commonly used in literature and research on disasters. Research generally focuses on the concepts of disaster management and disaster risk reduction (Kapucu, 2011). Governance is a concept that is more relevant to use in terms of disaster risk reduction and management activities. While disaster management is a more inclusive concept in terms of disaster management as well as risk reduction activities, whether they take place in context and are implemented or fail due to specific social and disaster governance frameworks (Melo Zurita, Cook, Harms, & March, 2015). The concept of disaster governance arises as a result of the recognition and functions previously carried out by various institutions. This means that government agencies are expected to collaborate with the private sector and the community if they want this governance to optimally run (Cooper, Bryer, & Meek, 2006).

In many cases, the capacity for disaster management can be assessed in several ways. Governance-related actions can be assessed from indicators that focus on vulnerability assessments. Globally, several indicators can be used as a measuring tool. Human development index, world development indicator, progress indicator, environmental sustainability index and environmental vulnerability index contain variables related to disaster vulnerability issues and governance capacity (Tierney, 2012). Departing from such indicators, the international paradigm for disaster management has begun to shift from post-disaster assistance to pre-disaster risk assessment and early warning systems as indicated in various international efforts such as the Hyogo Framework for Action 2005. At the same time, empowering local knowledge in addressing disasters has been emphasized by highlighting local knowledge of communities and direct access to affected sites (Paton & Johnston, 2001).

Adopted from McGinnis (1999), Lassa (2010a) describes disaster risk governance (DRG) as the way society as a whole manages its full array of disaster risks that can be caused by natural hazards such as earthquakes; climate change and hydrometeorological hazards (such as floods and cyclones); conflict and war to preserve development, human well-being and integrity. It promotes the notion of there being many overlapping arenas (or centres) of decision-making authority and disaster risk reduction responsibility (Lassa, 2016). Disaster governance still not a common one word used in disaster literature which does it seem to concentrate more on topics like catastrophe control and elimination of catastrophe risks (Marks & Lebel, 2016).

The Government of Indonesia has ratified the Disaster Management Act 24/2007, which addresses attempts to develop an 'early warning system' to reduce the number of casualties (Bainus, Yulianti, & Husin, 2020). Indonesia is making rapid development with a growing political and science community concerned with disaster management (Carley, Malik, Landwehr, Pfeffer, & Kowalchuck, 2016)

On 28th September 2018, an earthquake measuring 7.4 on the Richter Scale was followed by a tsunami that struck the west coast of Sulawesi Island, Indonesia. The epicentre was 26 km north of Donggala Regency and 80 km northwest of Palu City with a depth of 10 km. Earthquake shocks were felt in Donggala Regency, Palu City, Parigi Moutong Regency, Sigi Regency, Poso Regency, Tolitoli Regency, Mamuju Regency and even Samarinda City, Balikpapan City, and Makassar City (Sukino, Samad, Mangngasing, & Rivai, 2019b). This study aims to discussdisastergovernance-relatedpublicpoliciesanddescribedthesocio-economiceffectsofthe post-28 September 2018 disaster in Palu, Central Sulawesi, Indonesia.

II. LITERATURE REVIEW

Disaster governance is a coordinated activity between stakeholders involved in various risk reduction and disaster management efforts. Therefore, often unpredictable policy changes will only hinder the process of creating more disaster-resilient communities. It is hoped that the government will take more into account the bureaucratic transformation in these important institutions (Syahputra & Nivada, 2020). The modes of governance refer to the different forms by which governance can be realized (Pahl-Wostl, 2019).

Affecting Factors

Globally, disaster governance is influenced by numerous things (Bodin & Nohrstedt, 2016). The state is a unitary region, community and entity that has a legal basis, institution and network capacity that is considered capable of handling disaster governance issues. Although it is agreed that the patterns of handling and disaster governance from various countries will differ. Poor and developing countries suffer more casualties from natural disasters than developed countries. Economically, poor countries experience the greatest losses every time a disaster occurs (Kahn, 2005; Amalu et al., 2020;Anani et al., 2020). Poor countries which face many other pressing problems daily often cannot develop and sustain disaster governance capabilities (Douglass, 2015). Such countries rely on international agencies even for the most basic post-disaster assistance.

Inequality in income, welfare, access to services and political empowerment globally make disaster governance crucial among other elements. Disaster preparedness and management plans are important

components of adaptation strategies (De Sherbinin, Schiller, & Pulsipher, 2007). These inequalities, including gender disparities, significantly contribute to the vulnerability of the population and the threat of disasters faced by the population and society in broader terms (Tickamyer & Kusujiarti, 2020). Although sometimes vulnerable populations have considerable resilience when a disaster occurs in their area. It is very difficult for them to survive normally without disaster, let alone faced with catastrophic conditions.

Global sociodemographic trends also present challenges for disaster governance. Rapid urbanization is one such trend. Urban areas face certain risks of vulnerability. Technological disasters are very common in cities as industrial and infrastructure centres which are also focal points of political and social conflict. Potential damage such as a pandemic or a terrorist attack is very high (Tickamyer & Kusujiarti, 2020). The rapid growth of urbanization and global economic development is making population, construction, and community resources to be increasingly concentrated which not only increases exposure to disasters but also increases the complexity of disasters as well as the scope of their impact and extent of damage (Peng, Lin, Liu, & Xu, 2017). Rapid growth is a major source of disaster vulnerability in poor countries, especially as many fast-developing cities are located in physically and naturally vulnerable geographic areas (Nishi, Pelling, Yamamuro, Solecki, & Kraines, 2016). Disasters can worsen the conditions of people living on the outskirts of cities. The most effective approach for all city residents to get a sense of justice is to integrate for all residents by giving recognition and attention to inseminate disaster preparedness within the community (Meriläinen, Fougère, & Piotrowicz, 2020).

Cities in general are formidable entities in the sense that the city's existence has survived for years (Hein & Schubert, 2020). Centralized population growth in big cities in developing and developed countries makes cities very vulnerable to disasters. There will be more casualties if a disaster occurs in the city centre (Firman, 2017). Uncontrolled population growth will correlate with the use of uncontrollable residential land. The lack of strict rules from the government regarding settlement arrangement has led people to build houses and social groups in disaster-prone areas.

The potential for disaster will be exacerbated in the social structure if there is no optimization in the overall governance system. This usually occurs in developing countries (Kita, 2017). Also, weak law enforcement against rule-breakers usually occurs due to the lack of officials supervision, corruption, apathetic authorities toward environmental aspects and lack of public participation which is one of the causes of unstoppable population growth which makes urban areas very vulnerable to disasters.

Disaster Governance Characteristics

The concept of disaster governance is a governance system that includes the complexity of various lines and scales of activity (Rumbach, 2015). As the disaster cycle will continue as the population grows, diversity in scientific studies and the participation of all sectors are needed to formulate public policies. The approach to disaster governance is strongly influenced by cooperation between numerous sectors (Huck, Monstadt, & Driessen, 2020). Community organizations or NGOs play an important role in disaster governance activities as well as the character of the social and economic system of society (Huck et al., 2020). Also, disaster governance arrangements are influenced by the transition to political leadership. For a democratic country, a change of regime in power, in general, will also change the active regulations.

Similar to environmental management, disaster governance is also polycentric and multiscale in nature (Htein, Lim, & Zaw, 2018). The significant difference between disaster governance in each country can be seen from the extent to which the government provides space for NGOs to be involved. Both national and global scale collaboration between actors, government and NGOs of various elements and scales such as insurance companies and companies engaged in the community needs sector or infrastructure companies at the private sector, is very much needed (Adem, Childerhouse, Egbelakin, & Wang, 2018). This collaboration can be carried out in such a way through various mechanisms by strengthening the agreement and based on legal aspects of law or central and regional government policies (Hermansson M.L., 2016).

Government policies, law enforcement and institutional aspects require different treatment for each disaster cycle faced (Hermansson M.L., 2016). The most important thing to pay attention to, concerning policy implementers, is the programs or policies issued before a disaster occurs. Thus each element can prepare themselves not only when a disaster has occurred (Birkland, 2004). It is hoped that this policy can reduce the impact of disasters in the future. For example, if there is an NGO that designs an earthquake-resistant building structure, the central or regional government is responsible for providing necessary facilities and providing full support for the development process as well as making regulations to support these activities (Joseph, 2013). Also, at the regional policy level, this concept was socialized to regions with the same disaster characteristics (for example earthquake). The community must also be involved, starting from the planning process, implementation and evaluation of the results. Collaboration between NGOs as initiators and concept owners, the government as policymakers and determinants, the

private sector as resource providers and the community as targets as well as being involved in the implementation process, is the main concept of disaster governance (Maldonado, Maitland, & Tapia, 2010).

Different institutional policy adjustments are required during the post-disaster emergency response period due to two reasons: (1) some parties only focus on post-disaster management and do not play a role before a disaster occurs on the preparation of disaster management policies; and (2) while the second group is organizations (government, private sector and NGOs) that are already involved in the pre-disaster process. Thus, coordination is needed to provide different treatment for these two groups (Counc, 2006). Organizations and institutions are mobilized to be able to work according to protocols, work plans, and policies that have been previously made (Nishi et al., 2016). In the initial phase of disaster response, organizations or institutions will work and focus on saving lives and providing basic needs especially food and temporary shelter. After initial response plan was fulfilled secondary disaster management such as providing moral support to victims then became the focus (Sukino, Samad, Mangngasing, & Rivai, 2019a), in hope that the victims can quickly reorganize their lives. In the social context, involved actors including but not limited to public safety organizations, health organizations, volunteers, religious and military institutions. Meanwhile, on a large scale disaster, national and international organizations take over the plan patterns and strategies in disaster management. The effort to mobilize national resources in large-scale disasters depends on the extent of the pre-disaster planning process (Paton & Johnston, 2001). Thus, disaster governance studies emerge as a concept in national and international scale disaster preparedness.

A large scale disaster will trigger the formation of volunteer groups network from various circles of society (Lodree & Davis, 2016). Various laws and policy products came into effect and various institutions could be involved in providing long-term assistance to victims in affected areas on the post-disaster scenario, as well as in planning and implementing recovery activities. Based on the social context of the community, the scale of the disaster and institutional capacity, recovery efforts can be guided by national or international institutions (Holguín-Veras, Jaller, Van Wassenhove, Pérez, & Wachtendorf, 2012).

Disaster governance faces challenges at the implementation level. The habits of the community, humanitarian organizations, NGOs and other communities only place more emphasis on the process of immediate post-disaster emergency response activities (Col, 2007). Meanwhile, disaster mitigation stage is less implemented, including the post-disaster preparedness process and long-term infrastructure recovery efforts. This often occurs in poor countries that lack the resources to finance comprehensive disaster risk reduction programs. However, even developed countries have not been fully able to implement this program. As an example, the United States has created a cycle to reduce the impact of disasters. However, there are still some shortcomings in various fields (Crow & Albright, 2019). These shortcomings include land use and development control and pre-disaster planning for post-disaster recovery. The laws and regulations comprehensively provide instructions. Thus, when the initial impact of disaster occurs, local governments are given the freedom to make local regulations and policies for initial management.

III. METHODOLOGY

This research was conducted in Palu, Central Sulawesi, Indonesia which had the worst conditions due to the earthquake and tsunami on 28th September 2018. The focus of this research is to find out how the post-disaster public policies were implemented and what the post-recovery socio-economic effects will be for the community. Corresponding to the Sendai Framework on disaster risk reduction, the people-centred approach is one of the solutions in strengthening and successful post-disaster recovery efforts.

This study was based on a qualitative method with case studies approach which also examines literature studies and latest data that sourced from various explorative social elements to explore more people-centred approaches in the policy-making process by the government. Primary data were obtained through interviews and Focus Group Discussions (FGD) with government officials who understand how government regulations are implemented. Focus Group Discussion (FGD) was conducted to get a clearer picture of the post-disaster condition of the community. The post-disaster settlement and economic conditions of the community were the main highlights of the FGD process with local community leaders. Secondary data were obtained from various studies related to disaster and government governance such as both local and national scientific journals and online news media sources. Also, secondary data is obtained through observations and document study on government reports, the progress of post-disaster recovery programs and other document sources.

This article describes the government agencies their rules and regulations in responding to disasters occurrence in Indonesia. This study also discusses the condition of community settlements, starting from

temporary settlements built by the government and private sector, to permanent settlements for affected residents. Information was obtained from government authorities, the National Disaster Management Agency (BNPB) and Regional Disaster Management Agency (BPBD), and various elements of local and national NGOs.

Also, this article provides an overview of how to formulate a good disaster mitigation policy. This article presents preliminary findings from a homogeneous source data. The alternative approach chosen is following the characteristics of each area. The tsunami mitigation action plan is one of the management arrangements. This article aims to serve as literature material on which to form the National Action Plan for Disaster Risk Mitigation for 10 years period. In general, the framework used to formulate the action plan is to take the typology of the coast and the settlement approach in Indonesian territory.

Primary data and secondary data were processed using the triangulation method. The obtained data were grouped and reduced to obtain more accurate results. Data validation is carried out by free interviews with key informants. The results of the triangulation process will obtain a more accurate data source so that it is feasible to present the results of this study.

IV. RESULTS

The Indonesian government has a special agency called the National Disaster Management Agency (BNPB) and Regional Disaster Management Agency (BPBD) (Chatfield & Brajawidagda, 2013). At the regional level, the Regional Disaster Management Agency of Palu was formed in 2009. Under the description of its duties and functions, the BPBD Palu implemented policies in the field of disaster management, policy formulation and determination and quickly, precisely, effectively and efficiently refugees handling. Also, BPBD Palu plays a role in coordinating the implementation of disaster management activities in a planned, coordinated and integrated manner (Kusumasari & Alam, 2011).

In general, BPBD also plays a role in establishing guidelines and directions for disaster management efforts which include disaster prevention; emergency response; rehabilitation and reconstruction activities; preparing, determining and informing the mapped disaster-prone area; identifying existing community requirements to provide relief effectively; classify the worst affected focusing places for our activities and; ensuring mental wellbeing aid despite the high prevalence of depression, work, anxiety and other serious co-morbidities that emerged following the incident (Cordero-Reyes et al., 2017). BPBD also must compile and stipulate disaster management routine; reporting the implementation of disaster management to the regional head regularly both in safe and disaster emergency conditions; be responsible for facilities and infrastructure, finances and personnel in carrying out disaster management tasks (Cox, Scannell, Heykoop, Tobin-Gurley, & Peek, 2017); and to provide guidance to assist units in the implementation of disaster management tasks.

The presence of BPBD as an Indonesian's special agency in disaster management confirmed that the authority of disaster management has been fully mandated to BPBD (Zulqa, Herawati, & Sri Hardjanto, 2017). This centralized effort is better considerably better compared to the cross-ministries and other government agencies disaster management implemented in the past. At the 2016 National Work Meeting, the president specifically emphasized that every disaster event is the full responsibility of the Regent or Mayor, while on the other hand, the Governor can assist for example in the form of logistics. The strategic mobilization of services to provide relief to victims of disasters and the required. Planning of these events is important in mitigating the misery caused (Rodríguez-Espíndola, Albores, & Brewster, 2018). The national army and police force can be involved during the initial emergency response. This indicates that BPBD has authority, delegation and mandate in disaster management in their respective regions which have quite big authority relatively as an institution.

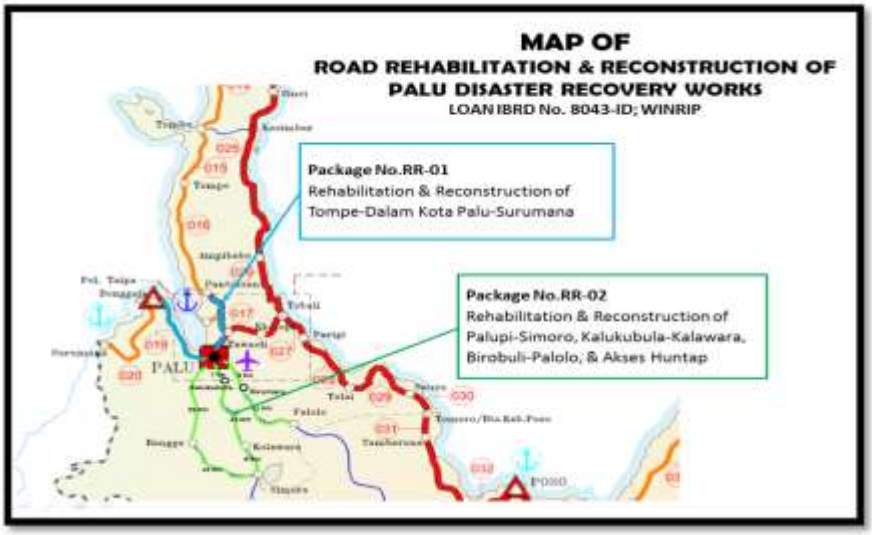
The Indonesian government regulation on Disaster Management states that institutions in disaster management are a demand for regional autonomy which characterizes the governmental system in Indonesia. The authority of government administration is relatively substantial in the process of formulating and implementing policies. If regional autonomy is to give authority to local governments to carry out their obligations and responsibilities, then disaster management in the regions will involve the implementation and responsibility of all elements of society to realize good governance. Akobeng noted a strong and responsive administration, consistency and sound bureaucracy Policies became key ingredients in maintaining development (Davis, 2017). There is a change in the disaster paradigm which focuses on pre-disaster or risk reduction. The government's position in this new paradigm is no longer dominant but prioritizes community participation by placing the community as the subject and no longer as the object of disaster management. The disaster management domain is no longer the absolute right of the national government but has been decentralized to each region. In regional autonomy context,

disaster management has also become the responsibility of each region, both in the financial and policy aspects (Faturahman, 2018).

Based on the Environmental and Social Management Framework (ESMF) Work Plan document for Post-Disaster Road Rehabilitation & Reconstruction, Palu - Central Sulawesi in collaboration with Western Indonesia National Road Improvement Project (090990) – WINRIP, data were obtained on the process of identifying potential activities that could be Funded through CERC.

The Ministry of Public Works and Public Housing has surveyed disaster affected areas on 4th – 7th December 2018. This survey aims to see and assess the technical aspects of the post-disaster proposed rehabilitation and reconstruction package (RR) of damaged roads. Figure 1 shows the detailed sections of the two proposed packages. The overall length for the RR-01 is 91.29 km and the RR-02 is 100.50 km. But the rehabilitation and reconstruction process that will be realized is 48.43 km for RR-01 (Table 1) and 37.74 km for RR-02.

Figure 1. Proposed packages: National Road RR-01 and Provincial Road RR-02



(source: Ministry of Public Works and Public Housing, 2020)

Table 1. RR-01: Rehabilitation and Reconstruction of Tompe – Palu – Surumana

No	Link Number	Link Name	Scope of Works	Length (km)
1	018.18	Jl. Abd. Rahman Saleh	Minor Rehabilitation	1,26
2	018.17	Jl. Basuki Rahmat	Minor Rehabilitation	1,74
3	018.12	Jl. Yos Sudarso	Minor Rehabilitation	1,49
4	018.11	Kebon Sari - Tanah Runtuh	Minor Rehabilitation	6,66
5	018	Kebon Sari - Tawaeli	Minor Rehabilitation	9,08
6	017	Pantoloan - Tawaeli	Minor Rehabilitation	1,77
7	019	Jl. Diponegoro	Reconstruction	2,68
8	019.15	Malonda - Ampera	Major Rehabilitation	23,50
9	020	Ampera - Surumana	Reconstruction	0,26
Total Length (km)				48,43

(source: Ministry of Public Works and Public Housing, 2020)

Figure 2. Proposed Package of Rehabilitation and Reconstruction (RR-01)

(source: Ministry of Public Works and Public Housing, 2020)

In Figure 2, the RR-01 project work is divided into four roads starting from Pantoloan-Tawaeli, then entering the Palu city road and ending at the Surumana Bridge. The work for this stage includes:

1. Rehabilitation work is located within the existing road space without an increase in asphalt width.
2. Asphalting work of approximately 48.43 km is the main work item on RR-01. Apart from asphalting, reconstruction is required for the two points that were swept away by the tsunami about 200 m long each.
3. Construction of side channels, drainage channels, slope stabilization, retaining walls and small bridges spread along RR-01.

Table 2. RR-02: Rehabilitation and Reconstruction of Palupi – Simoro, Kalukubula – Kalawara, Biromaru – Palolo and Permanent Relocated Settlement Access

No	Link Number	Link Name	Scope of Works	Length (km)
1	050	Palupi - Bangga	Major Rehabilitation	19,50
2	051	Bangga - Simoro	Major Rehabilitation	2,81
3	012	Kalukubula - Kalawara	Reconstruction	0,98
4	007	Biromaru - Palolo	Reconstruction	5,40
5	-	Jalan Akses Huntap	Reconstruction	3,98
6	-	Jembatan Akses Huntap	Construction	0,07
Total Length (km)				**32,74**

(source: Ministry of Public Works and Public Housing, 2020)

Livelihoods Housing

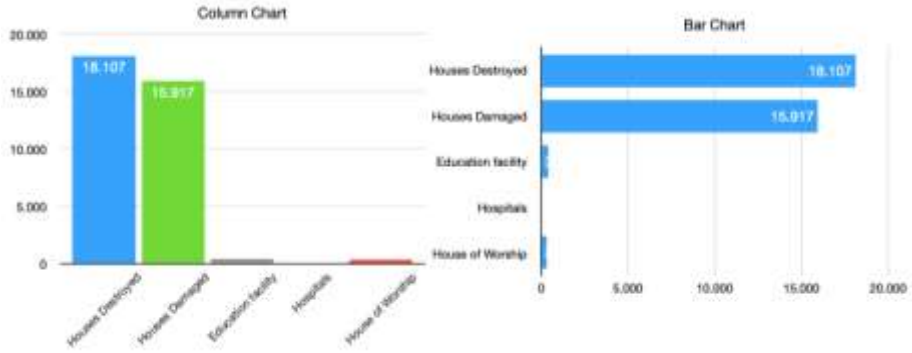
Many buildings and infrastructure were destroyed by the disaster. Most of the earthquake and tsunami disasters in the 2018 Sulawesi earthquake stemmed from liquefaction (Sassa&Takagawa, 2019). The data in Table 3 shows the amount of infrastructure damage caused by the earthquake, tsunami and liquefaction (BNPB, 2018)

Table 3. Disaster Impacted Buildings and Infrastructures

Infrastructure	Units
Houses Destroyed	18.107
Houses Damaged	15.917
Education facility	386
Hospitals	43
House of Worship	327
Office Building	78
Business Building	362

(source: National Disaster Management Agency, 2020)

Figure 3: Disaster Impacted Buildings and Infrastructures Chart



(source: National Disaster Management Agency, 2020)

Finding temporary shelter is the main solution for survivors (Faure Walker & Anna Crawford, 2017). In-depth policy studies are required for the process of rebuilding community settlements because it must consider the geological elements of the disaster-affected area. Post-disaster settlement locations, namely Balaroa and Petobo area, are two places where the liquefaction occurred. These two locations have been designated by the Palu city government as red zones and are prohibited areas for residential housings.

Two months after the disaster occurred, the government and domestic and foreign NGOs have carried out massive construction of temporary shelters. One of the temporary shelter locations for the survivors is in the Petobo area of Palu city. The Ministry of Public Works and Public Housing built 1200 residential units in three locations, namely Sigi Regency, Donggala Regency and Palu City (Arshandi, 2019).

There are five criteria for residents who are entitled to temporary housing: (1) there are small children present in the family; (2) sustained serious houses damage; (3) sustained minor housing damage; (4) there are pregnant women present in the family; and (5) there are elderlies present in the family. The purpose of establishing temporary shelters, in addition to providing material assistance to residents, is to revive and restore the psychological condition of disaster victims (Sukino et al., 2019b).

Temporary shelters were also built by one of the Indonesian National NGOs, AksiCepatTanggap (ACT). AksiCepatTanggap is a non-profit humanitarian nongovernmental organization based in Indonesia. ACT programs include emergency response, post-disaster rehabilitation, social empowerment and social development. ACT extends its network via offices abroad and representative persons (volunteer representatives). The ACT network has covered 30 provinces and 100 regenerations and towns on a local basis, in the form of branch offices and volunteer network (Indonesian Volunteer Society/MRI)(Mahmudi & Syauqillah, 2019).

Five thousands units of Integrated Community Shelter were built by ACT and spread across three disaster-affected regencies: Palu, Sigi and Donggala. Shelters are built on land owned by residents and government land with a contract system for two years. This temporary refugee area has public facilities such as bathrooms, schools, religious facilities and community activity centres. Each shelter is tailored to

the needs of the community (Darwati, samad, & Wekke, 2019). The 4x5 meter shelter building uses semi-permanent light steel construction. Workers are called from outside Sulawesi such as Java. In the early stages of development, this shelter was prioritized for injured refugees, pregnant women and toddlers, elderlies, and survivors with badly damaged houses.

There are two types of survivors' needs in refugee camps, basic needs for survival and medical needs to restore both physical and psychological conditions. Due to limited financial allocation, the shelters can be divided into two types depending on the needs: (1) Only providing necessities and temporary shelter; and (2) apart from providing basic needs, it also provides medical assistance, supporting facilities such as education, places of worship and logistical storage (Geng, Hou, & Zhang, 2020). ACT has built the second type of shelter in Lolu Village, Sigi Regency. This shelter also functions as logistics storage to supply other shelters. The second type of shelter is optimized to ensure the supply of material, logistical aid and other needs of the survivors for approximately two years after initial disaster impact while waiting for the government policy regarding the permanent housing for residents who lost their homes in the disaster.

One year after the disaster, the survivors still occupy refugee camps spread across Sigi Regency, Donggala Regency and Palu City. Public engagement and civic participation in long-term recovery were key to fulfilling the local people's expectations (Biswas, 2019). The area is a residential area for middle and lower income-group within the communities. The most impacted victims when the disaster occurred within a city are the low-income groups within the community (Hirayama, 2000).

Post-Disaster Economic Condition

The losses due to the occurred disaster in Palu is estimated at 13.82 trillion IDR. The impact of losses and damage due to this disaster covers 5 development sectors: (1) losses and damage to the housing sector (7.95 trillion IDR); (2) infrastructure sector (701.8 billion IDR): (3) productive economic sector (1.66 trillion IDR); (4) social sector (3.13 trillion IDR); and (5) cross-sector (378 billion IDR).

The housing sector suffered the most losses because of the extent and size of the impact of the disaster (Wu et al., 2017). Almost along the coast in Palu Bay, the buildings were wrecked and heavily damaged. The 2.2 to 11.3 meters tsunami with the nearly 0.5 km farthest reach has destroyed coastal settlements. Likewise, the subsidence of settlements in Balaroa, the liquefaction that submerged settlements in Petobo, Jono Oge and Sibalaya has also completely pulverized residential areas.

Based on the area, the loss and damage reached 7.63 trillion IDR in Palu City, 4.29 trillion IDR in Sigi Regency, 1.61 trillion IDR in Donggala Regency and 393 billion IDR in Parigi Moutong Regency. There was no calculation of the need for post-disaster rehabilitation and reconstruction (Adamy & Abu Bakar, 2018). It is estimated that rebuilding the affected areas during the rehabilitation and reconstruction period will require a budget of more than 10 trillion IDR ("BNPB," 2018). Post-disaster economic growth is also predicted to continue improving. Although the condition will certainly be different from the pre-disaster era. Most studies found detrimental at short notice Impact from which markets are improving and rebounding Trend "trajectory: the tragedy leads to a significant future one Contraction in production which remains below counterfactual non-disaster Maybe for a couple of years, but inevitably recovers and converges to the Trend for pre-disaster(Heger & Neumayer, 2019). Economic practitioners at Tadulako University predict that Palu's economic growth in the following year can is up to 6.4 per cent which is lower compared to 2017 (7.1 per cent). This is considered normal for a disaster-impacted region.

The natural disaster also destroyed four economic sectors in Palu, Sigi and Donggala: (1) agriculture; (2) trade; (3) hotel business; (4) restaurants and other service businesses. One month after the disaster occurred the sector was still ground to a halt with no economic activity. The government and volunteers are still focused on the process of evacuating victims and providing post-disaster life necessities.

To revive the post-disaster economy, the national government through the Minister of Finance has prepared instruments to revive economic conditions. One way is to remove public credit. Governmental funding must be able to be accessed evenly by the affected community to achieve an effective recovery process (Rouhanizadeh, Kermanshachi, & Nipa, 2020). The Financial Services Authority (Indonesia: *Otoritas Jasa Keuangan,* abbreviated as OJK) provides policies for Banks in disaster-impacted areas to provide rescheduling and adjustments to disaster-impacted customers. Restructuring for disaster victims was given for two to three years to provide opportunities for the community to recover the post-disaster economic sector. OJK noted that the amount of credit disbursed from banks to the three previous disaster areas reached 16.2 trillion IDR in September 2018 or the equivalent of 0.3 per cent of total national banking credit. A total of 14.3 trillion IDR of credit in Palu, 2 trillion IDR in Parigi Regency and 233 billion IDR in Donggala Regency has been distributed.

Other instruments have also been prepared by the ministry of finance, such as providing ultra-micro credit for the people who have lost their source of income. The Indonesian government is confident that the economic condition in Palu, Sigi and Donggala will soon be able to bounce back with these

instruments, especially since Indonesia has had experience in dealing with previous natural disasters, for example at Banda Aceh, Jogja and Lombok.

V. DISCUSSION

The reality shows that although National and Regional Disaster Management Agency has been formed, the sub-affairs of disaster management have not fully become the authority of this institution. This is indicated by the following phenomena. Human-made disasters will cause a natural catastrophe, and multiply human threats from interlinked stages (Maskuriy et al., 2020). In handling man-made disasters or social disasters, part of the authority is still handled by each sector. This example can be seen in the Sub-Affairs of Fire and Conflict which became a part of the Ministry of Home Affairs. In its implementation at the Regency and city levels, the affairs are handled by the Fire and Rescue Department. Another example is the Sub-Affairs of Community Protection which is handled by the National Unity and Community Protection Agency. For other social disasters such as the epidemic are handled by the Ministry of Health which at the city level is handled by the Health Office of Palu. Natural disasters such as Forest and Land Fires are handled by the Environmental Agency of Palu.

Another interesting phenomenon to note in the pre-disaster phase is the overlapping programs in Baru and North Lolu of Palu in 2015 and 2017 which is the Disaster Resilient Village Program (Indonesia: Desa Tangguh Bencana, abbreviated as DESTANA) from BNPB and Disaster Prepared Village (Indonesia: Kampung/KelurahanSiagaBencana, abbreviated as KSB) from the Ministry of Social Affairs. Disaster Prepared Village is a program to inseminate independent ability to adapt and face the threat of disaster within a village and to recover immediately from the adverse effects of a disaster if such disaster occurred (Pevitanada, Hariani, Profesor, & Soedarto, 2018). In the emergency response phase, the overlapping phenomenon was seen in terms of handling refugees. Aside from being handled by the BPBD, it was also handled by the Social and Manpower Agency of Palu and the Health Office of Palu, as well as the TarunaSiagaBencana (TAGANA) which is still under the guidance of the Social and Manpower Agency of Palu.

Regional regulations regarding spatial planning have not been finalized by the Central Sulawesi provincial government. However, the community has started to rebuild infrastructure after the disaster. Spatial use and management in Central Sulawesi should be implemented after the government has finalized regional spatial planning regulations. There will be many problems if post-disaster spatial use is not guided by regional spatial planning. Central Sulawesi itself has the history and topography of one of the most disaster-prone zones in Indonesia (Carvajal, Araya-Cornejo, Sepúlveda, Melnick, & Haase, 2019), which include earthquakes and tsunamis in the past. Thus, infrastructure rebuilding efforts must be following the disaster-based urban spatial planning and area planning instruments. Rebuilding Community-based housing is the cornerstone of urban growth. Through this strategy, citizens are hoped to understand the value of a house through earthquake-resistant building systems (Boy, Imani, Chari, Purba, & Melasari, 2019). The government is expected to pay attention to these issues because the city spatial plan will become the basis for any regional development program preparation. Another issue related to urban spatial planning concerns budget preparation, determining the development location for each sector, and settlement regulation and control. Geological, topographic and environmental sustainability aspects must also be considered by the government in drafting government regulations regarding spatial planning in Central Sulawesi. The preparation of urban and territorial spatial plans should be carried out in stages and through scientific studies related to the environment and disaster risk assessments.

Nationally, disaster management in Indonesia is considered to be not optimal where handling and decision making still seems to utilize a top-down pattern (Inan, Beydoun, & Pradhan, 2018). Partial, unintegrated and sectoral based disaster management becomes the obstacles. Education and public awareness of disaster mitigation are also still lacking. The general public still considers disaster mitigation to be limited to providing physical assistance during the emergency response period. To mitigate disasters, we must all be prepared with enabling laws, raised awareness, and stout infrastructure before the disaster happens (Yamanaka, 2019). Government regulations are expected to become a formal legal basis that regulates the functions and roles of various related parties in disaster management to encourage coordination between government agencies to produce more effective policies. This government regulation is expected to be able to become a way out to overcome various problems such as sectoral based and fragmented coordination and ineffective handling of disasters.

Post-Disaster Socio-Economic and Livelihood Recovery

On post-disaster recovery efforts, the government should work as a facilitator to build partnerships with local communities managing natural resources, sustaining livelihoods, and maintaining health ecosystem (Lin, 2019). Community involvement in the post-disaster economic recovery process is a challenge in

itself for the Central Sulawesi provincial government. The Ministry of Public Works and Public Housing did not consider the aspirations and input of disaster-affected communities regarding the construction of temporary shelters. The construction of temporary shelters carried out by the national government used a top-down pattern and is less participatory. The consequence is that the residential development process is not following the wishes of the community and is less efficient. This is the reason why the target of temporary shelter construction for disaster victims was not achieved. In the process of building temporary shelters, the central government should involve the community in a participatory manner, starting from the concept and form of housing by adjusting the local culture and climate. Likewise in the physical development process, it should involve and empower the local community.

The company appointed by the government to work on a temporary housing and shelter development project turned out to bring in workers from outside Sulawesi. *Skilled labour in the field of light steel construction* became one of the main reasons. In contrast, by providing short training and utilize local workers can provide an economic contribution to impacted local communities. However, the government did not consider this matter. The contractors still bring in workers from outside Sulawesi even though this is considered inefficient because it takes a long time to place these workers to the temporary shelter's construction site. On the other hand, the transportation costs for these *imported workers* are also substantial which resulted in the delayed process of completion from the predetermined time.

Post-disaster restoration involves a brand new phase of economic growth for the people, for the cities and the country concerned (Hayashi, 2012). Involving local communities is important for the process of the economic recovery of Palu and its surroundings that were affected by the disaster. Due to the involvement of local communities in the infrastructure construction process from the government, the disaster victims got jobs and income from their wages for the reconstruction project. Thus, this can be a solution for the post-disaster regional economic recovery process.

Ten months after the disaster occurred, many survivors still occupy refugee camps made from emergency tents from the government and volunteers. However, some survivors have also started building temporary shelters using the remaining debris that they can find around the evacuation site. Disaster victims with moderately damaged houses also began to carry out minor reconstruction of their homes using simple building materials such as wood, corrugated tin roofs, doors and other house interiors without expecting a temporary shelter made by the government and NGOs.

It is hoped that post-disaster economic recovery can be in line with the process of building temporary shelters. The synergy of the construction of the temporary shelters with economic conditions needs to be carried out immediately after the physical conditions and supporting infrastructure has been repaired. As a form of program efficiency, integration is required in data collection for all post-disaster aspects. The data collection process was carried out by each interest group (Rajindra et al., 2019). They collect data based on the goals, interests and needs of the group. Thus, post-disaster social and economic conditions data of the community is not uniform.

The main principle of post-disaster economic rehabilitation and reconstruction is to ensure that people can return to their original jobs before the disaster occurred. The principle also includes economic centre location and permanent residence. This is a challenge in itself for the government because restoring the physical and social environment and sources of livelihood as close as the pre-disaster condition is a major task which takes a long time and a mature concept (Samad & Aisyah, 2019). In addition, the government's task is to ensure that the reconstruction team can restore the conditions of community settlements according to the physical and social needs of the community.

Striving for numerous rehabilitation policies which at the same time to reduce existing inequalities is a must for the government. For example, impacted farmers and daily labours can return and obtain fields for farming and are given stimulants in the form of seeds, fertilizers and other necessary materials either individually or collectively as a part of economic rebuilding efforts. Local labours should be involved in the process of reconstruction of government physical projects. Thus, they can rebuild their lives after the disaster occurred. In this instance, a stimulant in the form of temporary credit suspension is also an alternative. Providing loans to restart a business is one option to help restore the economy of disaster-affected areas.

The government's seriousness is required in the post-disaster economic recovery process. For the agricultural sector, it is necessary to determine the status of land and agricultural areas lost due to liquefaction and earthquakes. Compensation for lost or damaged land is also an instrument in economic recovery. Thus, the impacted survivors can return to work on new land for the survival of their lives and families. In addition, the government also needs to develop mechanisms and systems to clarify the agricultural land ownership status to avoid conflicts regarding interest and land tenure between communities. This should be discussed with the leader of each community groups in the impacted area.

Donggala, Sigi and parts of Palu are mostly agricultural and plantation areas which were damaged by earthquake and liquefaction. Thus, the government is expected to provide solutions to farmers whose land is lost or damaged. Budget allocation is necessary for farmers to lease better condition lands around their village. This temporary lease of land must meet the elements of suitable agricultural land, one of which is the availability of water sources and transportation access for agricultural and plantation products that have been prepared by the government. The location of the leased land should not be far from the location of temporary or permanent housing for disaster victims. On the other hand, seeds and fertilizers aid is also expected from the government.

Another livelihood such as traders also needs to be provided with business capital assistance and business place provision tailored to the needs of the type and scale of their business. There is a need for business guidance to improve skills and use of appropriate technology through training and socialization. To accelerate recovery, it is also necessary to provide and improve access to information, capital, skills, technology and wider market access for survivors. The government can also provide job opportunities for disaster survivors in the construction of temporary and permanent shelters, especially for shelters which are located close to refugee camps and optimize existing labour-intensive programs and develop them on a wider scale.

VI. CONCLUSION

The first part of this study describes the special institution within the Indonesian government called the National Disaster Management Agency (BNPB) and the Regional Disaster Management Agency (BPBD). In general, the duties and functions of this institution are to establish guidelines and directions for disaster management efforts which include disaster prevention; emergency response; rehabilitation and reconstruction activities; and preparing, determining and informing the mapped disaster-prone area. Although the BNPB and BPBD have been formed, the sub-affairs of disaster management have not fully become the authority of this institution. This can be seen in the Sub-Affairs of Fire and Conflict which became a part of the Ministry of Home Affairs. In its implementation at the Regency and city levels, the affairs are handled by the Fire and Rescue Department. Another example is the Sub-Affairs of Community Protection which is handled by the National Unity and Community Protection Agency. For other social disasters such as the epidemic are handled by the Ministry of Health. In the emergency response phase, the overlapping phenomenon was seen in terms of handling refugees. Aside from being handled by the BPBD, it was also handled by the Social and Manpower Agency of Palu and the Health Office of Palu, as well as the TarunaSiagaBencana (TAGANA) which is still under the guidance of the Social and Manpower Agency of Palu.

The second part of this study shows that two months after the disaster, the government and domestic and foreign NGOs have carried out massive construction of temporary shelters. Shelters are built on land owned by residents and government land with a contract system for two years. This temporary refugee area has public facilities such as bathrooms, schools, religious facilities and community activity centres. Each shelter is tailored to the needs of the community. The 4x5 meter shelter building uses semi-permanent light steel construction. Workers are called from outside Sulawesi such as Java. In the early stages of development, this shelter was prioritized for injured refugees, pregnant women and toddlers, elderlies, and survivors with badly damaged houses. One year after the disaster, the survivors still occupy refugee camps spread across Sigi Regency, Donggala Regency and Palu City. Nationally, disaster management in Indonesia is considered to be not optimal where handling and decision making still seems to utilize a top-down pattern. Partial, unintegrated and sectoral based disaster management becomes the obstacles. Education and public awareness of disaster mitigation are also still lacking. The general public still considers disaster mitigation to be limited to providing physical assistance during the emergency response period.

The third part describes the economic impact of the disaster. The losses due to the occurred disaster in Palu is estimated at 13.82 trillion IDR. The impact of losses and damage due to this disaster covers 5 development sectors: (1) losses and damage to the housing sector (7.95 trillion IDR); (2) infrastructure sector (701.8 billion IDR): (3) productive economic sector (1.66 trillion IDR); (4) social sector (3.13 trillion IDR); and (5) cross-sector (378 billion IDR). Post-disaster economic growth is also predicted to continue improving. Although the condition will certainly be different from the pre-disaster era. Economic practitioners at Tadulako University predict that Palu's economic growth in the following year can is up to 6.4 per cent which is lower compared to 2017 (7.1 per cent). The national government through the Minister of Finance has prepared instruments to revive economic conditions. One way is to remove public credit. The Financial Services Authority (OJK) provides policies for Banks in disaster-impacted areas to provide rescheduling and adjustments to disaster-impacted customers. Restructuring for disaster victims

was given for two to three years to provide opportunities for the community to recover the post-disaster economic sector. OJK noted that the amount of credit disbursed from banks to the three previous disaster areas reached 16.2 trillion IDR in September 2018 or the equivalent of 0.3 per cent of total national banking kredit.

VII. Limitation And Future Study

No study covers all aspects of the research problem. The author must discuss the limitations or gaps of this study and also the scope or future research plans.

This study has limitations such as; (1) Government agencies that become the focus of research are only National and Local Disaster Management Agencies (BNPB and BPBD) in disaster-affected city and regencies; (2) the objects of research are only those with the most affected economic conditions in certain areas; (3) social and economic conditions are not ideal image condition of Indonesian society in general based on the difference on how disaster conditions in each region. Future research is expected to dig deeper into pre-disaster government policy issues.

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