

Rehabilitation and Reconstruction Post-Earthquake, Tsunami and Liquefaction Disaster in Central Sulawesi Province

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Abstract

Post-disaster recovery in Central Sulawesi Province covering Sigi District, Donggala District, Parigi Moutong District and Palu City which occurred in 2018 is a national priority program, because the impact is so great. The incident caused damage and losses to various important sectors in people's lives, such as housing, infrastructure, economy, social and cross-sector sectors. Rehabilitation and reconstruction efforts carried out by both central and regional governments and various related parties are certainly needed and have been running for the last 5 years. This study aims to evaluate the efforts that have been made in restoring all affected sectors. The methodology of this study is based on a literature study with the scope of a literature search study through secondary data obtained from where the researcher works, namely BNPB and other sources. The results show that there are 2 areas that have not fully recovered, namely Palu City and Parigi Moutong District. In both areas, there are still sectors that require further attention and action, namely the economic sector in Parigi Moutong District and all sectors in Palu City because they are below the pre-disaster baseline value. Therefore, a sustainable program involving all stakeholders is needed to improve the condition of these sectors.

Keywords: *Rehabilitation and Reconstruction, Post-disaster, Central Sulawesi*

INTRODUCTION

Based on Indonesian Disaster Information Data, over the last 10 years Indonesia has experienced a significant increase in disaster events. Each disaster event results in the loss of assets, including human, infrastructure, economic, social and environmental assets. One of the disasters that had a huge impact and provided a new history of disaster was the earthquake, tsunami and liquefaction that hit Central Sulawesi Province in 2018, covering Sigi District, Donggala District, Parigi Moutong District and Palu City. Liquefaction became quite a concern, because many had never heard of the disaster and it turned out to have a huge impact, especially on casualties.

The disaster that occurred in 4 (four) districts/cities affected all sectors of the community's livelihood. The 7.4-magnitude earthquake caused a 5-meter tsunami and land phenomena that claimed many homes and lives. The disaster claimed the lives of 4,845 people, displaced 172,999 people and destroyed 110,214 houses. The impact of this disaster not only claimed lives and homes, but also paralyzed the infrastructure, economy and social life of the people in Central Sulawesi. BNPB calculations released on October 26, 2018 showed that four regencies/cities in Central Sulawesi Province (Palu City, Donggala District, Sigi District, and Parigi Moutong District) suffered damage and losses of Rp18.48 trillion. Due to the scale and magnitude of the impact of the disaster, the residential sector suffered the greatest loss and damage. Buildings on almost the entire coast of Palu Bay were flattened and severely damaged. Settlements were destroyed by the tsunami, which reached heights of 2.2 to 11.3 meters. There

was also subsidence and uplift in Balaroa. Settlements in Petobo, Jono Oge and Sibalaya were submerged by liquefaction, causing thousands of homes to be lost.

To restore all sectors affected by disasters, the Central Government, Local Governments, Business Institutions, communities and all related parties jointly carry out recovery efforts in the form of post-disaster rehabilitation and reconstruction. This study aims to evaluate the recovery efforts carried out by looking at the post-disaster rehabilitation and reconstruction index carried out by BNPB, whether the affected sectors have fully recovered or there are still obstacles and still need assistance after 5 years have passed. By looking at the progress of recovery efforts, the results of this study are expected to help the Government or other parties carrying out rehabilitation and reconstruction efforts to see the extent to which the efforts made remain sustainable and have an impact on society, as well as to determine other assistance policies if they are still needed in sectors that have not yet recovered.

RESEARCH METHODS

The methodology of this study is based on a literature study with the scope of the literature search. The literature search was conducted through secondary data obtained from the researcher's workplace, BNPB, and other sources. The search used inclusion criteria using the keywords post-disaster recovery efforts. Some related articles were screened based on the exclusion criteria. Selected articles were screened based on the inclusion and exclusion criteria, then reviewed and written to answer research questions related to rehabilitation and reconstruction after the earthquake, tsunami and liquefaction in Central Sulawesi Province.

RESULT AND DISCUSSION

Post-Disaster Rehabilitation and Reconstruction Policy

In the post-disaster stage, post-disaster rehabilitation and reconstruction activities are a series of activities in seeking to restore the lives and livelihoods of disaster-affected communities. Post-disaster rehabilitation and reconstruction means managing the recovery of infrastructure after a disaster and restoring the condition of the community and the environment. According to Government Regulation No. 21/2008 on the Implementation of Disaster Management, post-disaster recovery is carried out by prioritizing rehabilitation activities based on an analysis of damage and losses caused by the disaster. This regulation also states that the government has the responsibility to carry out rehabilitation and reconstruction in the form of repair and recovery from various affected aspects. Recovery efforts are carried out on key sectors of society, such as housing, social, economic, infrastructure, and cross-sectors. Recovery efforts carried out in each sector support sustainable development programs.

The principle of rehabilitation and reconstruction is to build better and safer or often known as Build Back Better, Safer and Sustainability. Efforts made include: building disaster-safe construction, restoring and strengthening community socio-economic construction, building community capacity and preparedness in the face of disasters, and supporting sustainable development processes. To determine the planning of post-disaster rehabilitation and reconstruction efforts, it is necessary to conduct a post-disaster needs assessment, commonly referred to as Jitupasna. The Jitupasna concept consists of 3 components, namely disaster assessment, disaster impact analysis, and needs estimation. The results of Jitupasna are used as the basis for the preparation of the Post-Disaster Rehabilitation and Reconstruction Plan (R3P).

The R3P document is used as the basis for the implementation of rehabilitation and reconstruction for all parties, especially the Government.

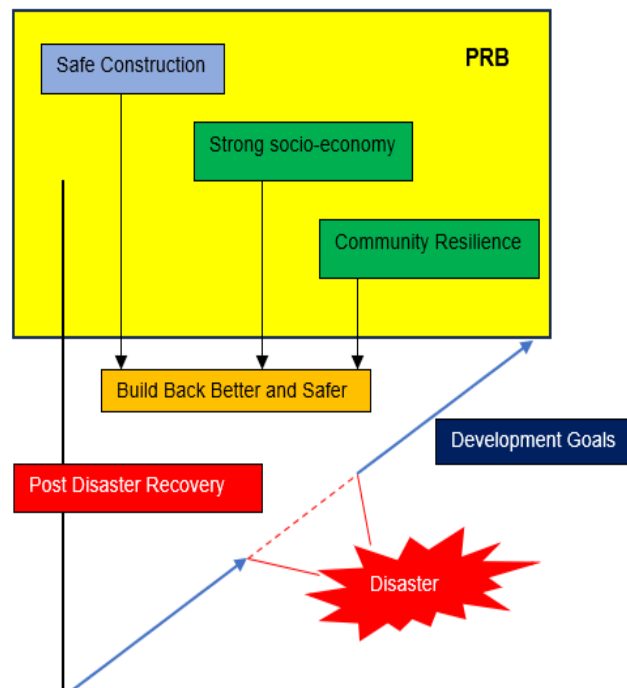


Figure 1. The Build Back Better and Safer Concept (Source: Ministry of PUPR)

To ensure that post-disaster reconstruction and rehabilitation efforts have been managed and have an impact on increasing the level of recovery in the community, BNPB compiled the Post-Disaster Rehabilitation and Reconstruction Index (IRRP). The IRRP also serves to evaluate the level of recovery by comparing the existing conditions with the initial conditions before the disaster occurred. This effort also contributes as a form of capacity building in an effort to 'build back better, safer, and sustainable' which contributes to reducing the level of risk in the Indonesian Disaster Risk Index (IRBI). The calculation of the rehabilitation and reconstruction index will be carried out in 5 post-disaster recovery sectors, namely the housing, infrastructure, social, economic and cross-sector sectors.

Post-Disaster Rehabilitation and Reconstruction in Central Sulawesi Province

Post-disaster recovery in Central Sulawesi Province covering Sigi District, Donggala District, Parigi Moutong District and Palu City which occurred in 2018 is a national priority program, because the impact is so great. The disaster had an impact on all sectors of community livelihoods, which in turn calculated damage and losses due to disasters in all sectors, namely the housing, infrastructure, social, economic and cross-sector sectors.

The government has stipulated Presidential Instruction Number 8/2022 concerning the Completion of Post-Earthquake, Tsunami and Liquefaction Rehabilitation and Reconstruction on September 14, 2022. The policy was made as an effort to accelerate the completion of post-disaster recovery in Central Sulawesi Province, which contains various division of tasks to 22 Ministries / Institutions, Provincial and District/City Governments affected in accordance with the Post-Disaster Rehabilitation and Reconstruction Plan (R3P) document and is valid until December 31, 2024.

A. Post-disaster Rehabilitation and Reconstruction Index of Sigi District

The Sigi District Government reported that 289 people died and 93,187 people were displaced. Many buildings were damaged, whether light, medium or heavy. There were various economic facilities, such as markets, shops, and other residences, and public facilities were also

disrupted. The number of public facilities and government offices that suffered heavy damage consisted of 1 (one) unit of regional general hospital, 9 units of community health centers, and 25 units of auxiliary health centers, Polindes, and Poskesdes located in 15 sub-districts. Based on the assessment of post-disaster damage and losses in the housing, infrastructure, economic, social and cross-sector sectors, the value of damage and losses due to the earthquake and liquefaction disaster in Sigi District reached Rp11.063.000.000.000, with details of damage amounting to Rp9.046.000.000.000 and losses reaching Rp2.017.000.000.000.

Based on the assessment of the Indonesian Post-Disaster Rehabilitation and Reconstruction Index conducted by BNPB in Sigi District in the 5th year (T+5), namely 2023, the average value of the post-disaster rehabilitation and reconstruction index reached 102.64%, up 6.69% from the average value of the index in 2018 and exceeded the baseline value or index in the year before the disaster (T-1) so that it was declared to have recovered.

Table 1. Index of Post Disaster Rehabilitation and Reconstruction of Sigi District

Sector	IRRP (%)							Increase 2018-2023 (%)
	2017	2018	2019	2020	2021	2022	2023	
Residential	100	94,03	94,59	97,11	100,25	102,15	102,21	8,18
Infrastructure	100	98,22	98,98	99,46	100,11	100,48	101,45	3,23
Social	100	98,59	99,26	100,04	100,67	100,74	100,39	1,80
Economy	100	97,99	95,32	103	106,4	108	108	10,01
Cross Sector	100	99,81	100,57	101,05	101,05	101,33	101,14	1,33
Average								4,91

(Source : BNPB)

From the description of the IRRP value in Sigi District in 2023, it is concluded that the average increase in IRRP across all sectors reached 4.91%. With a recovered status based on the average IRRP value of Sigi District in 2023, with all sectors having exceeded 100% (baseline).

B. Post-Disaster Rehabilitation and Reconstruction Index of Donggala District

Based on data from the Donggala District Government, there were casualties with details of deaths reaching 212 people, 175 seriously injured, buried / missing 21 people, and 36.346 people (11.478 families) displaced spread across 52 evacuation points. The report of the Donggala Regional Disaster Management Agency stated that the number of damaged houses reached 21.378 units consisting of 7.290 severely damaged units, 6.099 moderately damaged units, and 7.989 lightly damaged units. The results of the assessment of damage and losses in the social, economic and cross-sector sectors in Donggala District reached Rp704.582.000.000 with details of the value of damage worth Rp662.054.000.000 and the value of losses amounting to Rp42.528.000.000.

Based on the assessment of the Indonesian Post-Disaster Rehabilitation and Reconstruction Index conducted by BNPB in Donggala District in the 5th year (T + 5), the average value of the post-disaster rehabilitation and reconstruction index reached 104,52%, up 4,94% from the average value of the index in 2018 and exceeded the baseline value or index in the year before the disaster (T-1) and was declared recovered.

Table 2. Index of Post Disaster Rehabilitation and Reconstruction of Donggala District

Sector	IRRP (%)							Increase 2018-2023 (%)
	2017	2018	2019	2020	2021	2022	2023	
Residential	100	97,62	96,68	99,85	106,09	106,6	106,67	9,05
Infrastructure	100	99,63	100,95	102,88	105,87	106,31	106,97	7,34
Social	100	99,96	100,04	100,38	100,83	101,1	101,32	1,36
Economy	100	99,76	100,7	102,2	102,9	103,4	103,4	3,64
Cross Sector	100	100,92	102,11	103,08	104,05	103,94	104,26	3,34
Average								4,95

(Source : BNPB)

From the description of the IRRP value in Donggala District in 2023, it was concluded that the average increase in IRRP in all sectors reached 4,95%. With a status that has recovered based on the average IRRP value of Donggala District in 2023. The IRRP value of Donggala District in 2023 for each sector has exceeded the baseline (100%), with the sector with the highest value being the infrastructure sector, and the lowest value sector is the social sector.

C. Post-Disaster Rehabilitation and Reconstruction Index of Parigi Moutong District

Based on data from BPPB Parigi Moutong District, as many as 15 people were victims of the earthquake, and 2728 people were displaced. Damage to the housing sector occurred in 12 sub-districts, namely Parigi, Central Parigi, North Parigi, West Parigi, South Parigi, Siniu, Ampibabo, Toribulu, Kasimbar, Balinggi, Torue and Sausu. The total damage to houses reached 5.550 units with details of 533 units of houses severely damaged, 826 units of houses moderately damaged and 4.191 units of houses lightly damaged.

Damage to the infrastructure sector was the destruction of two bridges connecting district roads in Bambalemo Village, Parigi Sub-district. In the water resources sub-sector there was damage to irrigation networks in Olonjongi, South Parigi Sub-district, Toribulu, Ampibabo, Olaya, Tindiki, Torue and Parigi Kanan Sub-districts. The earthquake disaster also had an impact on the Health subsector, there was damage to the buildings of Anuntaloko Parigi Regional Hospital, Puskesmas, Poskesdes and Puskesmas Pembantu in a number of sub-districts in Parigi Moutong District. Meanwhile, the subsector also experienced massive impacts, including damage to 21 kindergarten buildings, 188 elementary schools, 101 junior high schools, 7 MTS, 30 high schools, and 1 special school building. In the religious sector, the earthquake disaster caused damage to houses of worship, namely 46 mosques, 26 churches, 25 temples, and 3 orphanages.

Based on the assessment of the Indonesian Post-Disaster Rehabilitation and Reconstruction Index 2023 in Parigi Moutong District in the 5th year (T+5), the average value of the post-disaster rehabilitation and reconstruction index reached 98,52%, up 2,68% from the average value of the index in 2018 with a status that has not exceeded the baseline value or index in the year before the disaster (T-1) and is declared not yet recovered.

Table 3. Index of Post Disaster Rehabilitation and Reconstruction of Parigi Moutong District

Sector	IRRP (%)							Increase 2018-2023 (%)
	2017	2018	2019	2020	2021	2022	2023	
Residential	100	95.92	98.81	100.96	101.56	101.56	101.48	5.56
Infrastructure	100	99.09	100.13	100.39	100.39	100.46	100.2	1.11
Social	100	100	99.82	100.04	99.91	100.09	100.13	0.13
Economy	100	83.72	90.7	90.7	90.7	93.02	90.7	6.98
Cross Sector	100	100.46	100.09	100.18	100.37	100	100.09	-0.37
Average								2,68

(Source : BNPB)

Based on the table above, the IRRP value in Parigi Moutong District shows an average increase of 2,68%. In the 2023 IRRP, Parigi Moutong's economic sector shows a recovery that has not been fully completed. Therefore, there needs to be a special effort to improve the condition of this sector through a program to improve the economic quality of the survivor community that is sustainable and must be carried out by all stakeholders and other multi-stakeholders.

D. Post-Disaster Rehabilitation and Reconstruction Index of Palu City

The value of damage and losses after the earthquake, tsunami and liquefaction in Palu City is estimated to reach Rp6.982.073.629.477. Based on the assessment and verification of the housing sector, the condition of houses affected by the earthquake, tsunami and liquefaction in Palu City reached 42.864 damaged housing units with details of 12.854 severely damaged housing units, 12.717 moderately damaged housing units, and 17.297 lightly damaged units.

Based on the assessment of the Indonesia Post-Disaster Rehabilitation and Reconstruction Index 2023 in Palu City in the 5th year (T+5), the average value of the post-disaster rehabilitation and reconstruction index reached 96,58%, up 0,39% from the average value of the index in 2018 and has not exceeded the baseline value or index in the year before the disaster (T-1) and is declared not yet recovered.

Table 4. Index of Post Disaster Rehabilitation and Reconstruction of Palu City

Sector	IRRP (%)							Increase 2018-2023 (%)
	2017	2018	2019	2020	2021	2022	2023	
Residential	100	93.22	90.88	91.25	92.42	93.09	93.46	0.24
Infrastructure	100	97.54	95.23	95.18	95.68	96.13	96.64	-0.9
Social	100	97.23	96	95.93	97.01	97.72	98.13	0.9
Economy	100	94.74	93.83	94.01	94.01	94.37	94.74	0
Cross Sector	100	98.21	98.68	99.72	99.53	99.81	99.91	1.7
Average								0,39

(Source : BNPB)

From the description of the IRRP value in Palu City in 2023, it was found that the average increase in IRRP in all sectors reached 0,39%. Based on the table above, it can be seen that all sectors still need attention because they have values below 100%. Therefore, special efforts are needed to improve the condition of all sectors with programs for sustainable survivor communities by all stakeholders and other multi-stakeholders.

CONCLUSION

Post-disaster rehabilitation and reconstruction efforts in the Central Sulawesi region have generally recovered after 5 years have passed since the disaster occurred. However, based on the results of BNPB's post-disaster rehabilitation and reconstruction index, there are two areas that have not fully recovered, namely Palu City and Parigi Moutong District. In both areas, there are still sectors that require further attention and action, namely the economic sector in Parigi Moutong District and all sectors in Palu City because they are below the pre-disaster baseline value. Therefore, a sustainable program involving all stakeholders is needed to improve the condition of these sectors. And no less important is to build community capacity and preparedness in facing future disasters, to minimize the impact caused in the event of future disasters.

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