

Social Economic Analysis of Disaster Recovery Index Sigi District CT

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ABSTRACT

The natural disaster that occurred in Sigi Regency, Central Sulawesi Province on September 28, 2018 has resulted in the disruption of people's lives as well as damage to educational, health and economic facilities. This requires an attempt to restore to normal. Recovery is a series of activities to restore the condition of the community affected by the disaster by re-functioning the infrastructure and facilities in the fields of education, health and the economy by carrying out rehabilitation. To measure the level of recovery after rehabilitation and reconstruction, a general measure in the form of an index number is needed, namely Ina-PDRI. The results showed that until now the post-disaster recovery index in Sigi Regency is 74.87 percent. This shows that the socio-economic conditions in Sigi Regency are still better before the natural disaster by 25.13 percent compared to the current situation. This value is the weighted average of the disaster recovery index in the Education sector which only reached 63.17 percent, the disaster recovery index in the Health sector only reached 66.81 percent. Meanwhile, the disaster recovery index in the economic

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1. INTRODUCTION

Indonesia is an archipelagic country located in the Pacific Ring of Fire. Under Indonesian waters, three large tectonic plates collide; namely the Eurasian Plate, Indo-Australian Plate and the Pacific Plate which have and can cause some of the deadliest volcanic explosions and earthquakes in human history. This geographical condition makes Indonesia very vulnerable to natural disasters [1]. One of the major natural disasters that have ever occurred in Indonesia was the earthquake, tsunami and liquefaction in Palu City, Sigi Regency, Donggala Regency and Parigi-Moutong in 2018. The natural disaster has claimed the lives of more than four thousand people and the loss of property is very large. The biggest loss from the natural disaster occurred in Sigi Regency [2] and [3].

The natural disaster that occurred in Sigi Regency, Central Sulawesi Province resulted in the disruption of people's lives in the fields of Education, Health and the economy. This requires a recovery effort towards a normal state, namely a series of activities to restore the socio-economic conditions of the community affected by the disaster by re-functioning institutions, infrastructure and facilities by carrying out rehabilitation [4]. The greater the impact caused by a disaster, the longer the time and cost required for the recovery process.

The disaster recovery process in Sigi Regency has been carried out in the form of rehabilitation and reconstruction activities [5]. To see the level of

recovery after rehabilitation and reconstruction, a general measure is needed in the form of an index number. This index will be called the Indonesia Post-Disaster Recovery Index (Ina-PDRI). These results are very important to see the achievement of post-disaster recovery rates for the rehabilitation and reconstruction that have been carried out by various parties in Sigi Regency, both from the social aspect, especially in the fields of Education and Health as well as the economic aspect.

2. LITERATURE REVIEW

2.1 Post-Disaster Recovery and Rehabilitation

Reconstruction In the literature on disasters, recovery is defined as the process of restoring the condition of the community affected by the disaster, by re-functioning facilities and infrastructure in their original state by making efforts to improve basic infrastructure and services [6] dan [7].

Recovery is closely related to rehabilitation and reconstruction activities. Based on Law No. 24/2007 article 57 [8] and Regulation of the Head of the National Disaster Management Agency (BNPb) No. 17 of 2010 [9] it is stated that post-disaster recovery activities consist of two main activities, namely rehabilitation and reconstruction. Furthermore, the substantial targets of rehabilitation and reconstruction include six targets, namely the humanitarian aspect, the housing and settlement aspect, the development infrastructure aspect, the economic aspect, the social aspect, and the cross-sectoral aspect [10] and [11].

2.2 Post-Disaster Recovery Indicators

The publication of articles in several journals specializing in disaster, shows that recovery indicators can be categorized into social, economic, environmental, and infrastructure categories. Of these categories, infrastructure; such as restoration of public and life support facilities (eg school facilities, health facilities) and improvement of economic facilities are categories that are often studied [12]. One reason is that social infrastructure indicators are generally measured at the output level, making it easier to measure than social indicators which are generally at the outcome level.

Recovery in the education sector, health sector and the economic sector are the most widely used indicators to measure the recovery process, this is due to the ease of obtaining data and measuring it [13].

This relates to the aspects included in post-disaster recovery contained in the Regulation of the Head of the National Disaster Management Agency Number 17 of 2010 [14], namely the humanitarian, social, and economic aspects at the outcome level. Thus, the post-disaster recovery aspect is related to the components in human development, with emphasis on indicators of the functioning of Education, Health facilities and the revival of the economy through business actors.

3. RESEARCH METHODS

Ina-PDRI is a composite index consisting of three indices to monitor recovery in health, education and economic aspects, using a formula for each index. The formula for calculating Ina-PDRI is in the equation [14].

$$(1) \quad [Ina-PDRI]_{it} = \sqrt[3]{(A_{Pit} \times A_{Sit} \times A_{Eit})}; n_i \neq 0$$

- Information :
Ina-PDRI_{it} :Indonesia Post Disaster Recovery Index from area i at time t
- AP_{it} :Recovery Index from the educational aspect of area i at time t
- AS_{it} :Recovery index from the health aspect of area i at time t
- AE_{it} :Recovery Index from the economic aspect of area i at time t

Calculation for recovery in education, health and economy is calculated based on the results of each indicator in accordance with National Board for Disaster Management (BNPB) guidelines

4. RESEARCH RESULTS AND DISCUSSION

The survey was carried out from July to August 2021 in Sigi Regency, Central Sulawesi Province. Based on the results of interviews with the Sigi Regency government, there are 5 sub-districts that are heavily affected by the disaster. Therefore, the survey was directed to the five sub-districts. The five sub-districts are Dolo District, South Dolo District, West Dolo District, Marawola District and Sigi Kota District. The survey was carried out to all villages and sub-districts in the five sub-districts.

Based on the calculation results, the value of the Post-Disaster Recovery Index (Ina-PDRI) in Sigi Regency is still at 74.87 percent. The results of these calculations indicate that the level of post-disaster life recovery at the time the survey was carried out was not running as well as before the disaster. Socio-economic conditions are considered to be running normally if the value of the Post-Disaster Recovery Index has reached 100 percent. This shows that the socio-economic conditions in Sigi Regency are still better before the natural disaster by 25.13 percent compared to the current situation. The Ina-PDRI value is a balanced average of the Post-Disaster Recovery Index scores in the education, health and economic sectors.

4.1 Education

Of the 38 schools that were the object of research in five sub-districts, as many as 35 schools were damaged and only 3 schools were not damaged by natural disasters. Of the 35 schools damaged by natural disasters, 16 were heavily damaged, 11 moderately damaged and 8 lightly damaged. As of the time of the survey, there are 24 schools that have been renovated and 11 schools that have not been renovated.

Of the 24 schools that were renovated, there is 1 school building whose renovation completion rate is 0-20 percent, there are 6 school buildings whose renovation completion rate is 21-40 percent, there are 3 school buildings whose renovation completion rate is 41-60 percent, there are 6 school buildings whose renovation completion rate is 61-80 percent and there are 10 school buildings whose renovation completion rate is 80-100 percent.

Meanwhile, the level of re-use/utilization is 10 school buildings that have just returned to function 0-20 percent, 6 school buildings that have just returned to function 21-40 percent, 3 school buildings that have just returned to function 41-60 percent, 6 schools that have just returned to function 61 -80 percent and 10 schools that have been functioning again 80-100 percent.

The calculation results show that the value of the Post-Disaster Recovery Index in the Education sector (AP_{it}) is still at 63.17 percent. The results are the weighted average value of the Post-Disaster Recovery

Index in the Education sector at the elementary school level of 71.17 percent, the Education Post-Disaster Recovery Index value at the junior high school level of 66.11 percent and the Education Post-Disaster Recovery Index value at the high school level of 53.57 percent. This condition makes it clear that the education sector in Sigi Regency is currently still behind by 26.83 percent (100-63.17) percent compared to the time before the natural disaster. This means that up to the time this survey was conducted, the condition of education in Sigi Regency had not been running normally. The low value of the Post-Disaster Recovery Index in the Education sector in Sigi Regency is caused by the number of schools damaged by the earthquake. Some of the damaged school buildings have not yet been renovated so that the school building cannot be used/re-used for student learning.

4.2 Health

There are 9 health facilities included in the sample area. Of the 9 health facilities, only 1 health facility was not damaged during the disaster, namely Poskesdes Langaleso. While 8 others were damaged. There were 3 health facilities which were slightly damaged, 3 health facilities were moderately damaged, and 2 health facilities were heavily damaged. Of the 8 health facilities that were damaged, there are 5 health facilities that have been renovated and 3 health facilities that have not been renovated.

A total of 1 health facility whose renovation completion rate reaches 0-20 percent, no health facility whose renovation completion rate reaches 21-40 percent, no Health facility whose renovation completion rate reaches 41-60 percent, and as many as 1 Health facility whose renovation completion rate is reaching 61-80 percent and 3 health facilities whose renovation completion rate has reached 80-100 percent. A total of 1 health facility whose renovation completion rate reaches 0-20 percent, no health facility whose renovation completion rate reaches 21-40 percent, no Health facility whose renovation completion rate reaches 41-60 percent, 1 Health facility whose renovation completion rate reaches 61 - 80 percent and 3 health facilities whose renovation completion rate has reached 80-100 percent.

From the calculation results, the value of the Post-Disaster Recovery Index in the health sector only reached (ASit) 66.81 percent. This indicates that the impact of the disaster on the health sector in Sigi Regency is still being felt. The current condition of the Health sector in Sigi Regency is still behind 33.19 percent (100-66.81) percent compared to the time before the natural disaster. This means that until this survey was conducted, the condition of the Health sector in Sigi Regency had not been running normally. The low index of disaster recovery in the health sector in Sigi Regency is caused by the number of damaged health facility buildings. Part of the damaged health

building has not been renovated so that the building cannot be used again for public health services.

4.3 Economy

There are 44 business actors in three sub-districts that are sampled in this study. In general, there has been an increase in turnover from business actors in Sigi Regency after the 2018 natural disaster. The total turnover of micro, small, medium and large business actors before the disaster was Rp. 395,200,000, while their current turnover is Rp. 419,190,000. Based on these results, it is illustrated that from the business actor's perspective in general, economic conditions have returned to normal. Economic activities in the form of production, consumption and distribution are already running as before the earthquake. Of the 44 respondents interviewed, there are 6 business actors whose current turnover is higher than before the natural disaster. There are 12 respondents whose current turnover is the same as before the disaster and there are 26 business actors whose current turnover is lower than before the disaster occurred. The turnover development process for micro and small business actors after the disaster was quite slow compared to the turnover development for medium and large business actors. This indicates that extra attention is needed from various parties to business actors, especially micro and small business actors in Sigi Regency.

The value of the Post-Disaster Recovery Index in the economic sector (AEit) has reached 99.46 percent. This indicates that the impact of the disaster on the economy in Sigi Regency has almost recovered. This makes it clear that the economic condition in Sigi Regency after the natural disaster has almost recovered. This means that the current economic situation is only 0.54 percent adrift (100-99.46 percent) compared to conditions before the natural disaster. The high value of the Post-Disaster Recovery Index in the economic sector in Sigi Regency is because the turnover of business actors has increased from the previous condition. The total turnover of business actors in the survey location has increased from Rp. 395,200,000 (before the disaster) to Rp. 419,190,000 (conditions during the survey). Only the number of workers in the business sector is still not running normally. The number of workers in the micro, small, medium and large enterprises sector before the disaster was 70 people, while until now the number of workers in these businesses is only 65 people.

5. CONCLUSION

The value of the Post-Disaster Recovery Index in Sigi Regency has only reached 74.87 percent, which is the average value of the Post-Disaster Recovery Index in the Education sector, the Post-Disaster Recovery Index in the Health sector and the Post-Disaster Recovery Index in the economy. This means that the socio-economic conditions at the time before the disaster occurred were still 25.13 percent better than

the conditions when the survey was conducted. This condition was caused by the low achievement of the Education recovery index value which only reached 63.17 percent, the Health recovery index value which only reached 66.81 percent. Meanwhile, the recovery index value in the economic sector has reached 99.46 percent.

In order to improve the socio-economic conditions after the disaster, it is deemed necessary to accelerate the rehabilitation and reconstruction of infrastructure in the Education and Health sector, whose Post-Disaster Recovery Index scores are still low. The rehabilitation and reconstruction is very important so that the Education and Health facilities can be used for the benefit of the people in Sigi Regency.

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