Social Economic Resilience in Facing Land and Forest Fire Disaster
(Case Study in South Sumatra Province)

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Abstract

Forest and land fires in South Sumatra Province tend to be a routine disaster in the dry season. The handling of forest and land fires needs to be linked to socio-economic resilience in order to be completely resolved. This study measures socio-economic resilience and links it with forest and land fires. The method used is qualitative analysis using the resilience concept of UNISDR. The result shows that all socio-economic resilience indicators in facing the disaster have been done by South Sumatera Provincial Government but not yet maximal. Some indicators that need to be improved are the diversification of local economic activities, the implementation of contingency plans in the event of a disaster, the establishment of incentives and clear penalties, and the increase of multi-stakeholder participation.

Keywords: socio economic resilience, land and forest fire disaster, disaster mitigation, disaster risk reduction, emergency respons, *karhutla.*

Introduction

Disasters, both natural and social, are challenges and risks that will continue to be faced and need to be anticipated by the Indonesian nation (White Paper of Defense, 2014). The smoke disaster triggered by forest and land fires (karhutla) is one of the most interesting disasters to be studied. As a form of transnational environmental pollution, in addition impacting the health and feasibility of air ecosystems at the local and national levels, smoke haze generated from forest fires in Indonesia has also affected the survival and economic activities of some other countries within the ASEAN regional (Bram, 2012).

Karhutla is actually not new for Indonesia. Indonesia had experienced considerable karhutla in 1997/1998. When it happened, El Nino Southern Oscillation (ENSO) caused Indonesia to experience the greatest forest fire disaster in the world (Tacconi, 2003). Table 1 shows some of the large scale karhutla that have occurred in Indonesia.

Table 1 Large Scale Land and Forest Fires in Indonesia

No.	Year	Area	Burned Area (ha)
1	1982	East Kalimantan	3.600.000
2	1987	Kalimantan, Sulawesi, Sumatera, Bali, Nusa Tenggara, and Timor	66.000
3	1991	Sumatera, Jawa, Bali, Nusa Tenggara, Kalimantan and Sulawesi	500.000
4	1994	Sumatera and Kalimantan	5.400.000
5	1997/1998	Sumatera, Jawa, Kalimantan, Sulawesi and Papua	9.750.000
6	2006	Sumatera, Jawa, Bali, Nusa Tenggara, Kalimantan, Sulawesi and Maluku	32.198

Source: National Disaster Management Plan (*Renas PB*) 2010-2014

Sumatra and Kalimantan always experience karhutla every year (Wardani, 2004). Both islands have large forests and many flammable peatlands. One of the provinces which always experience karhutla every year is South Sumatera Province. All districts/municipalities in South Sumatra Province are included in the high risk of karhutla disaster (BNPB, 2014). Forest and land fires occurring in South Sumatera in 2015 mostly occur in Ogan Komering Ilir, Musi Banyuasin, and Banyuasin. All three districts are suffering severe karhutla because the peatlands in the region are burnt so it is difficult to extinguish. The peat lands in these three districts are the largest peat land in South Sumatera Province. In addition, the karhutla that occurred in 2015 is more common in forested areas.

The condition of all districts/municipalities which is classified as high risk of exposure to karhutla in South Sumatera Province is actually very harmful. This is because the agricultural sector, including forestry, is one of the three largest contributors to regional GDP over the last 5 years (BPS South Sumatra Province). In addition, the province of South Sumatra also holds enormous potential because of its natural wealth not only from the agricultural sector but also from the mining sector. The mining and quarrying sector is the largest sector of GDP .

Karhutla in South Sumatra Province needs to be completely resolved because this province is one of the richest provinces in Indonesia. In addition, South Sumatra is also planned as one of the locations of Asian Summer Games (Asian Games) in 2018.

The direct impact of karhutla is the occurrence of a smoke disaster. The smoke disaster has disrupted various aspects of people's lives. Although the smoke disaster did not cause direct casualties, the smoke disaster caused many residents with respiratory problems. In South Sumatera, the number of people with Acute Respiratory Infection at the peak of karhutla reaches 83,484 people (Bappeda Provinsi Sumatera Selatan, 2015).

The smoke disaster in South Sumatera Province has also resulted in a decrease in visibility that affects the disruption of flight schedules. Visibility in the Province of South Sumatra as of October 9, 2015 is only 600 m. In addition, the number of Air Pollution Standard Index in South Sumatera Province also shows the air quality is at a dangerous level (497).The impacts of karhutla can affect the social and economic resilience of the people. UNISDR in 2012 has developed models of disaster resilience and sustainable development implemented in four areas: political-institutional, social, environmental and economic (United Nation Internasional Strategi for Disaster Reduction, 2012). This study will measure the socio-economic resilience of South Sumatra Province using a model of resiliency from UNISDR and link it to forest and land fires.

Researh Method

Data collection techniques in this study were conducted by collecting primary data. Primary data collection is done by purposive sampling technique, which is choosing a resource for a particular reason. The reason is the knowledge of resource persons on karhutla problem in South Sumatera Province.

Data analysis was done using Miles and Huberman model. Miles and Huberman in Sugiyono (Sugiyono, 2014) suggested that activities in qualitative data analysis consist of data

reduction, data presentation, and conclusion/verification. Data reduction is to summarize, choose the main things, focus on the things that are important, sought the theme and pattern. After data is reduced, the next step is data presentation. In qualitative research, the presentation of data can be done in the form of brief descriptions, charts, relationships between categories, flowcharts, and the like. Conclusions in qualitative research are new findings that have not previously existed.

Result and Discussion

Table 2 shows the implementation of socio-economic resilience indicator in South Sumatera Province. The three indicators of economic resilience used are the depiction of the impact of disasters on macroeconomics in the long run. From Table 2 it is seen that the indicators of economic resilience have been done although not yet maximal. Less than optimal indicators are actually caused more by the commitment of all stakeholders disaster. For example, incentive and penalty incentive indicators to improve resilience and encourage compliance with security standards, these indicators can be realized if fairness in law enforcement is well implemented. Violators of laws and regulations should be subject to sanctions in accordance with applicable and indiscriminate regulations.

Table 2 Economic Resilence Using 2012 UNISDR Model

No.	Interviewees (Representatives)	Diversify local economic activities and implementation of poverty reduction	Provide contingency planning to avoid losses in the event of a disaster	Establish incentives and penalties to increase resilience and encourage compliance with safety standards
1.	Regional Disaster Management Board of South Sulawesi Province		Has been done	Has been done
2.	Center for Operation Control of Regional Disaster Management Board		Has been done	Has been done
3.	South Sumatra Forestry Service		Has been done	Has been done
4.	Regional Revenue Service of South Sumatera Province			Has been done but not optimal
5.	South Sumatra Regional Planning Body	Has been done but not optimal		Has been done

Source: Author

The most important indicators need to be intensified are the efforts to diversify local economic activities and the implementation of poverty reduction. Of the five interviewees related to economic resilience, only 1 resource person can describe this indicator; that so far no effort has been made to diversify local economic activity. Efforts to diversify local economic activity is actually important as anticipation and steps to prevent the amount of loss that must be borne if karhutla occurs. Steps to diversify local economic activities can be applied for example by holding private parties (companies/corporations) to require them to hire local people to create a large business field. In addition, companies can also be required to set aside some of their profits in the form of Corporate Social Responsibility (CSR) to improve the skills of citizens so that little by little people around the area prone to karhutla have other skills than farming.

The indicator of poverty alleviation programs has been implemented in regional development policies. In the book of Regional Government Work Plan (RKPD) of South Sumatera Province in 2015 explained that poverty alleviation is one of the regional development priorities of South Sumatera Province in 2015. The poverty reduction effort

includes 7 affairs, namely education, health, youth and sports affairs, public works, agriculture, and marine and fisheries.

The second economic resilience indicator in the 2012 model of UNISDR is to make contingency plans to avoid disaster losses. BPBD of South Sumatera Province stated that karhutla contingency plan has actually been made, but in its implementation, it has encountered many obstacles, including weather factor causing prolonged dry season. The key to the successful implementation of contingency plan is good cooperation and coordination among all related agencies. Each side must understand its duties properly and commit to carrying out the task as best as possible.

The third indicator of economic resilience is to establish incentives and penalties to increase resilience and encourage compliance with security standards. All informants mentioned that this indicator has been done, especially in relation to law enforcement aspects on the prevention of karhutla. This law enforcement becomes an important aspect in the handling of karhutla as a preventive measure. Nevertheless, there are indications about the lack of firmness of this aspect of law enforcement because it is proven that karhutla always repeats every year. Implementation of strict and just law enforcement is key in the handling of karhutla and must be improved continuously.

The analysis of social resiliency based on the 2012 UNISDR resilience model is presented in Table 3. Almost all the interviewees mentioned that all indicators have been done. Some sources mentioned that the three indicators are not yet optimal.

Table 3 Social Resilence Using 2012 UNISDR Model

No.	Interviewees (Representatives)	Provide access to basic services and post-disaster security needs for all parties	Allocate safe locations for housing and all strategic activities	Enhance multi-stakeholder participation and strengthen networks and social ties
1.	Regional Disaster Management Board of South Sulawesi Province	Has been done but not optimal	Has been done	Has been done
2.	Center for Operation Control of Regional Disaster Management Board	Has been done	Has been done	Has been done but not optimal
3.	South Sumatra Forestry Service		Has been done	Has been done
4.	Regional Revenue Service of South Sumatera Province			Has been done
5.	Social Service of South Sumatra Province	Has been done but not optimal	Has been done	Has been done
6.	South Sumatra Regional Planning Body			Has been done
7.	Health Service of South Sumatra Province	Has been done	Has not been done	Has been done

Source: Author

Indicators of provision of basic service access and post-disaster security needs have been done but tend not to be maximal because social activities in the form of teaching and learning activities were disrupted because many schools were closed when karhutla occurred. However, health services actually increased because the government not only conduct health activities such as medication, but also do anticipatory activities such as providing oxygen cylinders in shelters and distributing masks to the community.

The second indicator is that the allocation of safe locations for housing and strategic activities has been largely done. Almost all sources said that the location of the karhutla was

not near the settlement or the house of the residents. In addition, strategic activities such as governance are also not disturbed. Nevertheless, one of the speakers, namely the Head of Health Problems Control Section of South Sumatra Provincial Health Office stated that the actual location of residential areas is not safe from karhutla, which is seen from the exposure of vast smoke and reaches to the settlement of the people.

The third indicator is increased multi-stakeholder participation and strengthening networks and social ties. All informants argue that this has been done, especially with the existence of cross-sectoral cooperation in handling karhutla. One of the speakers, Head of Center for Operation Control of Regional Disaster Management Board stated that this indicator is not maximized because of the lack of participation and initiative of the community at the time of handling karhutla in 2015. However, he mentioned there are also a handful of people who are members of the Fire Concern Society.

Relationship between Karhutla with Socio-Economic Resiliency

According to the sources, there is a close relationship between karhutla with economic resiliency. This is explained as the economic motive behind the slash and burn activity to open the land. How to clear land, both farm, and plantation, most easily and cheaply done by burning the previous planting. In South Sumatra, it is known that sonor (the rice cultivation system in the swamp area), is only done during the long dry season. Fire is used to prepare the land and then the rice is grown in a way spread. Furthermore, the land is abandoned and only harvested 6 months later. This method is the easiest and cheapest way because it requires less manpower and funds. Another economic advantage of this sonor system is that people can get the remaining fish in the swamp.

Karhutla belonging to the slow-onset disasters category will likely have a wider and longer-term impact. This long-term impact will also affect macroeconomic variables such as the level of community savings, investment, domestic demand in aggregate, and lower productive capacity.

The close relationship between karhutla with economic resilience provides a clear perspective on how to handle karhutla so as not to be a protracted problem. Steps that must be done is to help provide the resources needed by the community to open the land. These resources should not be money because they are vulnerable to misuse. The resources in question can be in the form of equipment and man power. Provision of equipment can be done by cooperating with companies located close to the prone areas of burning. A binding and decisive agreement is required, i.e. the company should not open the land by burning and should help the surrounding community to open the land in a conventional manner (without burning). The agreement must be associated with the company's permission to be properly implemented. If necessary, the government can also mobilize military forces to help people clear land. This is included in the effort to prevent the karhutla disaster so that the involvement of military force can be covered by the concept of military operation other than war.

Most of the speakers mentioned that the social life of the people is not too affected by the karhutla. The education sector was disrupted due to karhutla, with the absence of several schools. However, the social condition of the community is relatively little changed with the occurrence of karhutla. People working in the office keep working as usual. Government activities and community services continue to run regularly. Local governments also not collapse, but only need assistance from the central government.

Social toughness tends to be unaffected by the existence of karhutla because community behavior in the form of burning land to open agricultural land and plantation has become a habit. This makes people as familiar with karhutla happenings that occur every

year so they tend to adapt because they have no other choice. How to adapt them is by using a mask when traveling out of the house. One resource person, the Head of Health Problems Control Section, South Sumatra Provincial Health Officer, stated that the impact of karhutla, especially in the health sector, will only be visible in the long term so it is difficult to measure and the community relatively ignore it because the impact cannot be not seen instantly. He also mentioned that the best thing that should be done by the community when its environment is affected by the smoke disaster is to evacuate to a safe place and free from smoke. But in reality, this is almost impossible to do by most people because of the limitations in terms of economy and resources.

Conclusion and Suggestions

Conclusion

Based on the descriptions described in the preceding sections, it can be concluded as follows:

a. There are some indicators that need to be improved to achieve better socio-economic resilience in facing *karhutla* disaster in South Sumatra. These indicators include the diversification of local economic activities, the implementation of contingency plans in the event of a disaster, the establishment of incentives and clear penalties, and the increase of multi-stakeholder participation.

b. There is a close relationship between *karhutla* and economic resiliency. This is explained by all sources as the economic motive behind the slash and burn activity. The *karhutla* relationship with social resiliency tends to be weak, that is, most of the speakers mentioned that social life at the district/city level is not significantly affected by *karhutla*.

Suggestions

Suggestions from the results of research are as follows:

a. Practical suggestions:

1) The core problem of karhutla is the limited resources owned by the community to open the land. Therefore, the government should help provide the necessary resources such as equipment to clear the land. The provision of this equipment can be done by cooperating with companies located close to the prone areas. If necessary, the government can also mobilize military forces to help people clear land. This military engagement is done in the context of karhutla disaster prevention so that it can use the approach of Military Operational Concept Other Than War.

2) Forest and land fires can be minimized if prevented from the outset, especially by preventing peat lands from burning. Commitment from all parties, whether government, private, or community, is needed so that the handling of forest and land fire disaster can be effective. This commitment can be realized for example through a memorandum of understanding and cooperation agreement, and also strengthened with binding reward and penalty.

3) Law enforcement related to karhutla needs to be firmly implemented. Local governments should act fairly to implement existing regulations, both to individuals and companies. This is important to provide a deterrent effect.

b. Theoretical suggestions:

1) For more intensive results, research that measures socioeconomic toughness on a smaller, community-level, family, and individual level is necessary.

2) Further research can add inferential statistical analysis to obtain more comprehensive results.

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