Efficient Vol 3 (1) (2020): 719 -725 DOI: https://doi.org/10.15294/efficient.v3i1.36695

EFFICIENT

Indonesian Journal of Development Economics

https://journal.unnes.ac.id/sju/index.php/efficient

The Impact of Merapi Mountain Eruption to the Society

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Permalink/DOI: https://doi.org/10.15294/efficient.v3i1.36695

Received: July 2019 ; Accepted: October 2019 ; Published: January 2020

Abstract

The impact of Mount Merapi Eruption has positive and negative impacts on society, especially in the agricultural sector. Therefore, the purpose of this study is to analyze the impact of the Mount Merapi Eruption on the economy of the people of Sleman Regency, Magelang Regency, and Klaten Regency in terms of the potential sector in the Regencies, that is agriculture. Thus it can be used as one of the considerations to boost and develop the agricultural sector. This study uses secondary data from BPS (Central Statistics Agency) Magelang regency in the form of rice production within 3 years, 2010-2012. Based on the results of the analysis, it can be seen that regional income has decreased after the disaster in 2010. The agricultural sector which is the primary sector and the leading sector has decreased in contribution so that it shifts its role to the non-base sector. However, variations occurred in some regions in the district to meet their daily needs, eventually turning into a non-base profession. The results of this study see that the impact of the eruption of Mount Merapi on economic productivity in Sleman Regency, Magelang Regency and Klaten Regency.

Keywords: Agriculture, Productivity, Eruption.

Abstrak

Dampak Erupsi Gunung Merapi memiliki dampak positif dan negatif terhadap masyarakat, terutama di sektor pertanian. Oleh karena itu, tujuan dari penelitian ini adalah untuk menganalisis dampak Erupsi Gunung Merapi terhadap perekonomian masyarakat Kabupaten Sleman, Kabupaten Magelang, dan Kabupaten Klaten dalam hal sektor potensial di Kabupaten, yaitu pertanian. Dengan demikian dapat digunakan sebagai salah satu pertimbangan untuk mendorong dan mengembangkan sektor pertanian. Penelitian ini menggunakan data sekunder dari BPS (Badan Pusat Statistik) Kabupaten Magelang dalam bentuk produksi beras dalam waktu 3 tahun, 2010-2012. Berdasarkan hasil analisis, dapat dilihat bahwa pendapatan daerah mengalami penurunan setelah bencana pada tahun 2010. Sektor pertanian yang merupakan sektor primer dan sektor utama mengalami penurunan dalam kontribusi sehingga mengalihkan perannya ke non-basis. sektor. Namun, variasi terjadi di beberapa daerah di kabupaten untuk memenuhi kebutuhan sehari-hari mereka, yang pada akhirnya berubah menjadi profesi yang tidak berbasis. Hasil penelitian ini melihat bahwa dampak erupsi Gunung Merapi terhadap produktivitas ekonomi di Kabupaten Sleman, Kabupaten Magelang dan Kabupaten Klaten.

Kata Kunci: Pertanian, Produktivitas, Erupsi

How to Cite: Yudistira, D., Fadilah, R., & Setiawan, A. (2020). The Impact of Merapi Mountain Eruption on the Community Economy. Efficient: Indonesian Journal of Development Economics, 3(1), 719-725. https://doi.org/10.15294/efficient.v3i1.36695

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ISSN 2655-6197

INTRODUCTION

Volcano or volcanoes, in general, are terms that can be defined as a system of hot fluid channels (assistance in the form of liquid or lava) that extends from a depth of about 10 km below the surface of the earth to the surface of the earth, including sediments resulting from the accumulation of material released at when it erupts. Volcanoes are found throughout the world, but the location of the most recognizable volcano is the volcano along the arc of the Pacific Ring of Fire.

Mount Merapi is the youngest mountain in a series of volcanoes that lead south from Ungaran Mountain. This volcano was formed due to activity in the subduction zone of the Indo-Australian Plate which could move down the Eurasian Plate causing volcanic activity to occur along the middle of the island of Java.

Mount Merapi is a stratovolcano type with lava dome, the elevation is ± 2,911 m above sea level and has a width of ± 30 km (Bemmelen, 1949; Katili and Siswowidjojo, 1994). The forest area around the peak became the Mount Merapi National Park since 2004. In general, volcanoes erupt in a long period, but Mount Merapi erupted in a short time. On average, a short period ranges from 2-5 years, a medium span of 5-7 years and a long period that reaches 30 years. Mount Merapi received special attention from the government because Mount Merapi erupted in the short term ie 2-5 years and Mount Merapi was surrounded by dense settlements.

Farmer Exchange Rate is one indicator to measure the level of welfare of farmers. FER calculation is obtained from the comparison of the price index received by farmers against the price index paid by farmers. Farmer exchange rates describe the level of exchange power/purchasing power of farmers against products purchased/paid by farmers that include consumption and production inputs purchased. The higher the exchange rate of farmers, the better the purchasing power of farmers against consumption products and production inputs, and means relatively more prosperous.

METHOD

The data used in this study are primary and secondary. The primary data used is qualitative and is used to answer exploratory and narrative research questions. Such as to find out the attitudes and patterns of life of the farming community in the slopes of the Merapi volcano affected by natural disasters. Primary data collection is done by observation techniques and direct interviews with informants.

The secondary data in this study is used to determine the impact of the eruption of Mount Merapi on economic sectors. The data used is information about the Merapi eruption that occurred from 1990 to 2018. Then the data on farmer exchange rates and productivity of the agricultural sector, especially food crops.

This research was conducted on the slopes of the Merapi volcano which experienced the impact of the disaster. Consists of four districts namely Sleman, Magelang, Klaten and Boyolali. The focus of research to explore qualitative information will be centered on one area that has experienced the most severe disasters in each district.

In this study, two analytical techniques will be used namely qualitative descriptive analysis and quantitative descriptive analysis. Descriptive analysis will focus more on the use

of descriptive and exploratory statistical analysis.

RESULTS AND DISCUSSION

The territory of Indonesia as the meeting place of the Pacific Circum mountains and the Mediterranean Circum. Even in Indonesia, it is known as the "Volcano Country" because it has many active volcanoes. Indonesia has volcanoes and eruption paths along the ring of fire or the ring of fire which is an active volcano pathway that is very dangerous in the world.

Volcanoes prone to eruptions are located along the ring of fire, located in Sumatra, Java, Bali, Nusa Tenggara, Sulawesi, Banda, Maluku, and Papua. Mount Merapi is located on the border of the two provinces of D.I. Yogyakarta and Central Java. Mount Merapi is one of the most active volcanoes in Indonesia. Mount Merapi is a stratovolcano type with lava dome, the elevation is ± 2,911 m above sea level and has a width of ± 30 km (Bemmelen, 1949; Katili and Siswowidjojo, 1994).

The danger of volcanic eruptions consists of two direct and indirect hazards. Direct Danger is a danger that directly befalls the population when the eruption takes place. For example, hot clouds, hot air as a side effect of hot clouds, and throws of material the size of blocks (bombs) and gravel. While secondary hazards occur indirectly and generally take place after eruptions, such as cold lava which can cause damage to land and settlements. Land on Mount Merapi faces both primary and secondary hazards from Mount Merapi in the form of land damage due to erosion and cold lava floods. Damage also occurred in the social-economic life activities of people in the affected areas.

2006 Eruption

In April and May 2006, signs began to emerge that Merapi volcano would erupt marked by earthquake and deformation. At that time the Regional Government of Central Java and D.I. Yogyakarta had prepared an evacuation effort when the volcano erupted, at that time the government had directed instructions so that people who lived near Mount Merapi immediately evacuated to the place provided. On May 15, 2006, Mount Merapi erupted, but on June 4, 2006, Mount Merapi activity exceeded the alert status.

2010 eruption

The upgraded status from "normal active" to "alert" on September 20, 2010, was recommended by the Yogyakarta Center for Investigation and Technology Development (BPPTK). After about one month, on October 21, the status changed to "standby" since 18:00 WIB. At this level of displacement activity has to be prepared. Due to increased activity, indicated by the high frequency of multiphase earthquakes and volcanic earthquakes, since 06.00 WIB October 25, BPPTK Yogyakarta recommends an increase in the status of Mount Merapi to be "alert" and all residents of the area within a radius of 10 km from the summit must be evacuated and evacuated to the area secure.

2018 Eruption

Mount Merapi erupted again on Friday, June 1, 2018, at 08.20 West Indonesia Time with a duration of 2 minutes. According to

BPPTKG, the Merapi volcano eruption column was around 6,000 meters from the summit, or around 8,968 meters above sea level northwest and was observed from the Jrakah Observation Post. The eruption caused ash rain in the Observation Post of Mount Merapi Jrakah and Selo. Even the ash rain reaches Salatiga and Semarang Regency. People are advised to remain calm and be aware of the ash rain and to always wear personal protective equipment (PPE), such as glasses, jackets, and masks when outside the home.

Environmental Impacts of Merapi Eruption

A variety of plants and natural forest ecosystems are affected by a variety of volcanic eruptions. Some plants are not traversed by erupted smoke (wedhus gembel) so that they do not damage while the surrounding area which is passed by hot clouds is damaged. This causes damage to the natural ecosystems of threatened forests. Loss of water sources by volcanic material cover can result in changes in irrigation patterns. Damage to water sources and also waterways is caused by an eruption in the form of loss or displacement of springs, silting rivers by Merapi material.

Cold lava arises from the accumulation of volcanic material at the peak during an eruption that forms a lava dome eventually slide down at any time in the event of rain. Damage to land due to eruption varies greatly, including in terms of thickness of volcanic material covering the land. Thick volcanic material cover either from the eruption or from cold lava causes the boundaries of land ownership to be blurred and sometimes lost, especially land along the river banks.

The social impacts are temporary loss of residence or permanently because it is a disaster-prone area (including in the red zone), loss of livelihoods due to damage to agricultural land and the destruction of business premises, separation from the patriarch due to father or Many husbands choose to remain at home on the grounds of protecting their homes, property and working as farmers, gardening or breeders, meeting basic needs such as food, drinking, temporary shelter or shelter, education, health, and inadequate clean water facilities, not available or limited public facilities and social facilities, disruption of education of children who cannot go to school due to damage to school facilities and infrastructure, risk of developing minor illnesses (coughs, flu) or infectious diseases (for example diarrhea) due to environmental conditions and places less clean and not conducive shelter as well as inadequate health service facilities, and obstructed the implementation of social functions and roles in kinship and the carrying out of life tasks in society, for example, social gathering, traditional or cultural activities that cannot be carried out at refugee locations, boredom due to uncertainty how long should be displaced, feelings of helplessness, fear and even feelings of hopelessness in the face of the possibility of a disaster that cannot be avoided (cannot go against God's will). As a result arises feelings of anger, stress or frustration with situations and conditions that are completely erratic, traumatized, hopeless, feeling helpless and uncertain about their future.

Positive Impact of Merapi Eruption

Not only the negative impacts arising from the eruption of Mount Merapi, but there are also positive impacts due to the eruption of Mount Merapi. Land covered by the volcanism of Merapi volcano is very good for agriculture.

The existence of volcanism and volcanic ash created by the eruption of a crater or volcano can make the land around become more fertile. This is certainly beneficial for those who have livelihoods as farmers. Farmers get benefits after the eruption of Mount Merapi because fertile soil makes them very productive and farmers' exchange rates increase. And the abundant sand makes new livelihoods like sand miners.

Red Zone Region

The eruption of Mount Merapi also had a direct impact on the socio-economic community living around the slopes of Mount Merapi. Specifically in three districts namely Klaten Regency, Sleman Regency, and Magelang Regency.

The eruption of Mount Merapi has had a serious impact on residential land around Mount Merapi, one of which is the Klaten district. Kemalang District is one of the sub-districts in the Klaten Regency which is located on the slopes of Mount Merapi. Kemalang subdistrict area is located on the slopes of Merapi, which is at an altitude of 500 to 2500 meters above sea level. The Klaten district of Kemalang District occupies the Red Zone or the alert zone for the eruption of Mount Merapi because of its location on the slopes of Mount Merapi.

The eruption of Mount Merapi also affected Sleman regency, in Cangkringan and Turi sub-districts where the three sub-districts belong to the red zone of Mount Merapi eruption. Sleman Regency is almost the same because the majority of the population earns the livelihood of farmers and ranchers. Many people are not aware of the importance of disaster management when it happens at any time.

Not only Klaten and Sleman Regencies but the Mount Merapi Eruption had a direct impact on Magelang District, Dukun District, and Srumbung District. In the Magelang region, Central Java, one of the concerns is Kali Putih after the 2010 Merapi eruption, Kali Putih being the area most frequently hit by lava floods. The runoff of material by such intensive flooding activities with a large amount of material luggage had cut off the Yogyakarta-Central Java national road precisely in the Gempol area, Salam. Not only cut off roads, but lava floods also damage infrastructure around the area. Of the many negative effects caused by the cold lava flood of Merapi, saved a large potential that can be utilized by residents around Merapi to become a work area.

The eruption of Mount Merapi caused agricultural land which was originally a productive agricultural land to turn into a sea of sand and rocks. As a result, many farmers lose money and cause the exchange rate of farmers to decline so that the level of welfare of farmers also decreases. However, after the eruption of Mount Merapi, the soil became fertile because after being covered by volcanic ash which contains nutrients that can make the soil more fertile. Soil fertility after the eruption of Mount Merapi makes farmers experience large profits because of increased farmer exchange rates.

Seeing the losses caused by the eruption of Mount Merapi is not small, it is necessary to eradicate the eruption of Mount Merapi disaster to reduce these losses. One way that can be done to minimize the number of

casualties in the event of a disaster is with effective mitigation planning. With good mitigation planning, at least the residents who are victims of the eruption will be helped in finding a place to stay that is safe from the eruption of Merapi. According to Law No. 24 of 2007, natural disasters are disasters caused by events or a series of events caused by nature such as earthquakes, tsunamis, volcanic eruptions, floods, droughts, hurricanes, and landslides. While the disaster that recently hit Indonesia is the eruption of Mount Merapi in 2010.

Mitigation according to Law No. 24/2007 is a disaster management effort to minimize the impact of damage caused by disasters as well as to minimize the number of victims. Therefore an effort is needed to resolve these problems, especially for residents who have lost their homes. The impact of the eruption on human settlements and can determine safe evacuation routes for victims of the Mount Merapi eruption in the affected area.

The Impact of Mount Merapi Eruption on Rice Production

It can be seen from the data of the Central Statistics Agency of Sleman Regency in 2011 which shows a decline in rice production due to the impact of the eruption of Mount Merapi in 2010. The decline in rice production in 2011 reached 32,941 tons of rice. However, in 2012 there was a large increase of 80,002 tons due to the fertile soil in the region.

Magelang Regency in 2011 data shows a decrease in rice production due to the result of the eruption of Mount Merapi in 2010. The decline in rice production in 2011 reached 25,298 tons of rice. But in 2012 there was a large increase of 43,300 tons.

In the data in 2011, Klaten Regency shows a decrease in rice production in Klaten Regency. But indirectly in 2012 experienced a very significant increase in rice production, amounting to 186,266 tons in Klaten Regency. After the eruption of Mount Merapi in 2010, rice production in Klaten District increased due to arable land.

We can conclude that the eruption of Mount Merapi in 2010 had a direct impact on the decline of rice production in 2011 in Sleman, Magelang, and Klaten. However, in 2012 indirectly the result of the eruption of Mount Merapi had a positive impact, namely the impact of causing the land affected by the red zone to become more fertile and the land produced greater rice production.

Rice production in Sleman Regency, Magelang Regency, and Klaten Regency have a very significant increase due to fertile soil. Of the three regencies, Klaten Regency had the biggest increase in rice production, reaching 186,266 tons. From this, it is evident that the eruption of Mount Merapi has an impact on the agricultural sector.

CONCLUSION

Mount Merapi eruption has direct and indirect impacts and can damage the land. In general, land damage due to eruption is the loss of water catchment areas, the destruction of forests, and even the closure of water sources, and the loss of waterways, and the destruction of agricultural land. The burial of land and the inhibition of land formation due to repeated eruptions on Mount Merapi, the loss of access roads to agricultural land and the loss of land selection boundaries by the eruption and cold lava have resulted in community livelihoods being lost in the

agricultural sector. People began to switch professions to become sand sellers to fulfill their needs. The eruption of Mount Merapi harms the agricultural sector. But on the other hand, the eruption of Mount Merapi brings good luck in the agricultural sector because of its fertile soil.

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