Flood Disaster in Sutojayan Sub-district, Blitar Regency, 2004

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Abstract. This study aims to answer the question of what factors are caused the flood disaster in Sutojayan District in 2004, how the process of the flood occurred and how the government responded to the incident. The used of the historical method of descriptive writing with analytical models. The Data used the study are documents and other sources related to the subject matter. The results of study indicate the flood occurred in Sutojayan 2004 was the biggest flood Compared to previous floods. This flood was caused by prolonged rain, Topographic forms and the river which was unable to accommodate flood water and mud from the mountains, due to the destruction of the Kepek forest. This flood of the give impacts on economic, social problems, and psychologicals. This condition invites responses from various parties, especially the government who then takes action in order to recover repairing the damage to both infrastructure due to floods and anticipation so that no similar events will occur in the future. The conclusion of this study is that flood can be caused by both natural and human factors. Natural factors including prolonged rain, soil topography, etc., and human factors roomates are illegal logging results in damage to the forest, thereby reducing the water infiltration and Unable to withstand water and mud from the mountains.

1. Introduction
A disaster is an event that can be caused by nature, man-made or a blend of both that occurs suddenly, causing a tremendous negative impact for the survival of life. In the incident, the elements related directly or affected must respond by doing extraordinary measures in order to adjust at the same time restoring the original condition or better [1]. The fact is, everyone does not want to experience it. However, disasters are often inevitable [2]. The one of them is flooding, this flood often occurs in areas that have landforms with a slope of flat to gentle slopes. The land in the class has this version is alluvial soil. Usually uses consist of settlements, fields, irrigation, and rainfed [3]

Blitar Regency is one of the regions in the Southwest Capital of East Java. Geographically at 112 ° 9'55 " - 112 ° 17'28" East Longitude, and 8 ° 8'32 " - 8 ° 12 '54 " South Latitude. Blitar Regency has 22 sub-districts, one of them is Sutojayan Sub-district. Sutojayan sub-district consists of Bacem Village, Jegu Village, Jingglong Village, Kalipang Village, Kaulon Village, Kedung Bunder Village, Kembang Arum Village, Pandanarum Village, Sutojayan Village, Sukorejo Village, Sumberejo Village. In 2004 the...
Sutojayan sub-district suffered a flood. Flood in Sutojayan was caused by rivers that could not afford water due to the destruction of the forest of kepek. Wildly degraded forests caused mud from mountains to rivers that increased the volume of water [4]. The occurrence of floods in Sutojayan Sub-district and the destruction of this Kepek Forest had a linkage because that sustains the ecosystem in Sutojayan Sub-district.

The main function of the forest is to maintain the ecological system of the environment, and to absorb water when it rains. If the forest is damaged then the forest does not work as a system of environmental balance. History records that Sutojayan Sub-district is often hit by annual floods. The most severe floods in Sutojayan occurred on December 04, 2004. Floods caused by overflowing were the Bogel River flowed through the village of Sutojayan, which immersed of Sutojayan Sub-district five villages up to two meters high. The five villages are Sutojayan, Pandanarum, Bacem, Kalipang and Kedung Bunder. That caused dozens of houses damaged, and there were seven people killed. The incident is still a bad memory and not annihilated to citizens, so they are still traumatized by the devastating event. The purpose of this study is to explain how the flood disaster process in Sutojayan occurred.

![Annual Flood Affected Area Maps, Sutojayan](image)

**Figure 1.** Annual Flood Affected Area Maps, Sutojayan

2. **Method**

This article is based on historical research method by following the steps that Heuristics, Criticism, Interpretation, and Historiography. Heuristics is done by tracking the various sources of relevant history, then these sources are classified into primary and secondary sources. Source criticism is done in two steps, namely external criticism and internal criticism. Interpretation is done by identifying any sources obtained through the analysis and synthesis stages. Historiography by drafting systematically by the rules, and weave the chronological history sources.

The collection of resources is done by interviewing the residents in the Sutojayan Sub-district. In addition to the collection of source also interviews conducted with library of Jember University, and found several sources of books and theses that have relevance to the topic of discussion. The books are: the work of Primus Supriono, Seri Pendidikan Pengurangan Resiko: Bencana Banjir, who bit discuss the process of flooding. S Ari Priambodo works, Panduan Praktis Menghadapi Bencana, which deals with disasters, etc. While some other sources, obtained from the E-book, news and internet articles. The study
was conducted so that the author can obtain more detailed information regarding the process of flooding in Sutojayan Sub-district area and cause flooding and, the impact of the floods.

3. Results and Discussion

3.1 Flooding

Flooding is not independent of the water cycle. Change in land use, from forestry to agriculture or even settlements, will consequently change the ecosystem of the environment and cause damage to the elements of the environment. Environmental conversion triggers erosion and a degradation of water flow and quality, while any modification in land use cause change in social, economic, and cultural aspects [5]. Floods have dynamic properties and static properties. The dynamic, extreme climatic conditions, such as high rainfall intensity, soil degradation and siltation of rivers. The static, such as geography, topography, and river conditions that include slope flow, sedimentation, and the shape of the flow [6]. Flooding also depends on human action in the utilization of natural resources is not prudent, for example, illegal logging, the construction industry in the upstream region, and the expansion of settlements in the area of water catchment areas, affect the water cycle so that there was flooding [7].

The floods have repeatedly occurred in the Sutojayan Sub-district. However, in 2004 the biggest flood occurred in this sub-district [8]. Flooding caused by heavy rain for three days, from Wednesday, December 01, 2004 until Saturday, December 4, 2004 occurred due to overflow of the Bogel River. Bogel River is one of the river that flows in Blitar Regency which is a Brantas tributary which empties into the upstream bending of Lodoyo. The existence of this river is highly expected by the community around the river to irrigate because, most of the residents of Sutojayan are farmers. Flooding that occurred was never imagined by the inhabitants Sutojayan, although this region often become flooded but the flood in 2004 was larger than the previous year.

Temperature and rainfall have an important influence on a region, especially in equatorial regions such as Indonesia. In a watershed (DAS), the existence of temperature and rainfall can be used as a parameter of extensive land use changes, in addition to factors of human activity [9]. Sub-district first Sutojayan flood affected areas in 1999 due to damage Kepek Forest. Kepek Forest is jati forests are in Sutojayan that serves as a water catchment. Kepek Forest is located at an altitude of about 250 m above sea level. Jati trees in the Kepek Forest the source of life for the residents Sutojayan. Forests are a very important environmental component so that changes in forests also have a major impact [10].

Forests have three functions, namely economic, ecological, conservation and socio-cultural functions. The economic function of forests is a source of state and community income through timber and non-timber extraction activities in the concession area, both by business entities and local communities. Ecological and conservation functions are forests that become the backbone of the stability of life-supporting ecosystems, and sources of biodiversity.

The socio-cultural function is that the forest becomes a balancing arena between the world of reality and the cosmic culture of society in a large system of fair, sustainable and sustainable management of forest resources [11]. However, the neglect of the three functions of the forest has resulted in the emergence of natural disasters. Awareness of the importance of the function of forests is still unknown to the surrounding community but rather, they are destructive rather than guarding for future generations [12]. This Kepek Forest is located at an altitude of around 250-300 m above sea level while the Sutojayan Sub-district is at an altitude of 100 m above sea level.

Jati has a high value so that a group of people who are in Region Wonotirto Montain illegal logging and the results of logging, jati wood is sold illegally to meet their economic needs. The population in the Wonotirto Mountain region is indeed mostly unemployed. So, with them having no jobs, they destroy the forest [13]. Kepek deforestation caused catastrophic flooding because forests are not working anymore for water absorption rain forest especially Kepek have higher topology of the Sutojayan Sub-district, so that if the heavy rains the mud of the Kepek Forest go down to Sutojayan. The main cause of the damage
in Kepek Forest is annual flooding in Sutojayan. Most severely affected areas are Sutojayan Village and Kedung Bunder Village. The water level in the village reached (2-3 meters) [14].

The coming flood is a 5-year cycle. Flooding in 2004 was reminiscent of flooding in the Sutojayan Sub-district in 1999. The difference of the two lies in the magnitude of the volume of disaster and the victims of the disaster. These events can be viewed from the flow of water flow in the rainy season and the number of grooves that facilitate bend overflowing stream. Geomorphological analysis of the Sutojayan area is a flood plain that has a concave morphology [15]. Sutojayan is under the Wonotirto Mountains in the south and the area Panggungrejo in the eastern region. As a result, when the torrential rain water coming from the south and east clump together into one Sutojayan [16].

Heavy rainfall is actually not the main cause calamities that befall Sutojayan. Flooding in the area is also due to the destruction of water catchment areas. Damage caused by water infiltration in the soil structure Sutojayan region itself is less able to hold water or water-resistant. When the heavy rains, the river is not able to catch water and mud from the mountains. In addition, the flooding associated with the lack of control on water catchment areas, is not fixed channel. People are less concerned and low awareness about protecting the environment [17].

3.2 Flooding Impact on Citizens Sutojayan

3.2.1 Economic impact

Floods occurred in Sutojayan on 04 December 2004, caused various damages. Flood events always come at the height of the rainy season. In general, Indonesia is known as a tropical region with high rainfall. However, there are variations or differences in the occurrence of the rainy season, namely in October to March with rainfall from 200 to 400 mm / month [18]. While in these months is the time of the rice planting season, even sometimes it's time to harvest. Floods in 2004 resulted in the paddy fields which are in Sutojayan about 163 ha under water, at that moment farmer planted rice aged 40 days. This means that the potential loss of harvests up to 10 million rupiahs per hectare or $ 1.6 billion rupiahs [14].

Damage to rice was also triggered by the quality of the water that soaked the rice plant is very bad because it is contaminated by waste water disposal. It is the people's welfare has decreased because most of the people who have profession as farmers, their income fell between 33.5% to 40%. Also the difficulty of finding jobs for farm workers who do not work the land owner who was no longer able to pay the workers [19]. The impact of floods in Sutojayan apart from losses in livelihood also suffered losses to property damage to homes Sutojayan is approximately 95% of homes, which are 213 of homes was damaged because of fallen down and 31 of homes was floated and carried away by water.

The damage caused by flooding into the house with a height of 2 m while the majority of homes have the height of 3.5 m and therefore, the property that was in the house were damaged as broken fence, and chairs scattered everywhere and some things are missing. Flooding in Sutojayan was remarkable. In an instant surge of water can sweep possessions. Residents in Sutojayan feel uneasy because farm animals are also many who died that cows, chickens, goats, buffalo [20]
3.2.2 Social impact

Flooding do not only cause economy loss, but also socially broad impact. Social impact can easily be seen is the emergence of the refugee camps that house the flood-hit people because they have no choice but to evacuate to places that are considered safe. In the refugee camps established several service units such as, common kitchen provides food to refugees, health and food aid or clothing. As in the Sutojayan Village and Kedung Bunder Village clean the house and property can be saved. In addition residents flocked to drying clothes, mattresses, chairs and stuff lain freshly cleaned of mud. Floods came so quickly causing panic among residents hit by flooding, because the enormity of the flood that occurred in Sutojayan 2004 resulted in a lot of possessions washed away.

Seven people have died in the area Sutojayan Sutirah (60), Sutinah (62), Naris, Paidi. While the three other victims have not been identified. The average victim was found rescuers around his residence [4]. Socially flood disasters has also become the cause of a stress disorder among the victims. Stress disorder arising from emotional and physical experiences were terrible in the life. This is because, the flood victims directly witnessed the disaster that hit them and swept away their belongings.

3.3 Response To Flooding

The risk of flooding depends on the combination of components consisting of hazards and vulnerabilities. Flood risk can’t be avoided completely and should be managed. As a result, flood disaster management does not attempt to eliminate the danger of flooding, but to mitigate them. Successful management of flood risk is obtained if the measures of structural and non-structural implemented [21].

3.3.1 Government response

The flood disaster in Sutojayan Sub-district in 2004 was a major disaster affecting life in various aspects, as outlined in the previous section. Government responses to the disaster appears in the process of disaster management from initial emergency evacuation, to the stage of post-disaster rehabilitation. Disaster management was done in SDN Kedung Bunder I, SDN Kalipang and Sutojayan Village Multipurpose Building. The response given by the government in order to reduce the misery felt by the public. Forms other response is to provide assistance to the community needs such as noodles, rice and
bottled mineral water. The government is also building a temporary refugee sites and constructing facilities and infrastructure damaged.

Help also came from the medical team. The medical team urged that people living in flooded areas, to be vigilant about diarrhea, flu and skin diseases. The former location of the flood is still very moist, very weak condition of the victims because of lack of sleep and fatigue. Endurance will decline so susceptible to disease. The location was dirty range with diarrhea and skin diseases are also emerging as the floodwaters contained drifting garbage along the water [22]. In addition, the government also fix waterways such as Bogel Rivers that have been damaged by the brunt of the floods. Although still much under construction, government efforts to improve the water line project.

3.3.2 Community response

Society is a unity of human life that occupies a real area and conducts continuous interactions that are applied with certain customary systems and is bound by a sense of community identity [23]. Society is a unity of human life that occupies a real area and conducts continuous interactions that are applied with certain customary systems and is bound by a sense of community identity. The statement states that the community cannot be separated from the name interacting. The results of these interactions will lead to action. As is the case, the floods that occurred in Sutojayan Sub-district mobilized much public sympathy. This states that life in the community is mutually helpful. People around the Sutojayan area pay attention to the victims of the floods. Post-disaster volunteers and donors also sprung up to help the flood victims. Solidarity with the flood victims came from different parties, both corporate (company), social organizations, educational institutions as well as a number of individuals. Providing assistance in the form of decent clothes to wear, basic food commodities (oil, sugar, rice, noodles, coffee, etc.) [4].

Among educational institutions elementary school, junior high school, high school in Blitar almost all of them do support such a donation in the form of noodles, rice, and wearable clothes. Donations received by the people Sutojayan. Other donations came from the personal and social organization [14]. In addition the role of women is very important to ease the burden of the victims. One of them, cook a meal to eat together in the evacuation area. With it, then the volunteers usually asked to wrap the rice to ration the victims. The day they get a food ration as much as 3 times for breakfast, sing, and night [24].

4. Conclusion

The flood disaster occurred in Sutojayan Sub-district, which is a flood-subscribed area each year because the shape of the topography with low land and in its natural Sutojayan is no longer balanced. This imbalance is caused by illegal logging of Kepek Forests by irresponsible communities. From logging the Kepek Forest, the problem is prolonged, namely annual flooding from November to December. The biggest flood in Sutojayan occurred in 2004. Floods occurred due to heavy rain for three days so that the river could not hold water.

This is due to the release of the river due to the increased volume of water due to the rain. The river cannot hold water because the Kepek Forest is deforested which results in mud from the mountains coming into the river which adds to the volume of water. These events have an impact that is the economic impact and social impact. Economic impacts, such as losses suffered by farmers, namely the inundation of rice fields by water which results in crop failure, losses also experienced by farmers, namely many dead animals such as cows, goats, chickens, and other livestock. The next impact is the social occurrence of flooding, with many residents experiencing panic when hit by the flood. Floods also killed seven people. With this, the government swiftly built refugee camps.

The impact caused by flooding in Sutojayan Sub-district has encouraged the government and surrounding communities to provide assistance to ease the burden on the victims. The assistance provided is in the form of food and clothing that is suitable for use. The government also brought medical teams to prevent diseases caused by the floods. The government is also repairing water channels such as the Bogel River which has been damaged by the brunt of the flood. The community response is the arrival of volunteers and donors to help flood victims.
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