Implications of the COVID-19 pandemic on fire hazards forest and land in Barru District, South Sulawesi

A M Rafii¹ and S Millang²

¹ Doctoral Program Forestry Science, Hasanuddin University, Makassar
² Faculty of Forestry, Hasanuddin University, Makassar

Email: smillang78@gmail.com

Abstract. The Covid-19 pandemic poses a threat of forest destruction, especially forest fires, along with the increase of intensity of humans entering and exploring the forest. It is suspected that many people who live in urban areas have lost their jobs due to layoffs and moved to villages, and then opened new lands because their supporting facilities were no longer relevant to the current conditions, the COVID-19 pandemic. These people who abruptly start their activities in the forest and do not understand the rules of preventing forest fires are making the forests vulnerable to fires. The purpose of this study was to determine the effect of the COVID-19 pandemic on the dangers of forest and land fires in South Sulawesi. It used a descriptive method, and data was collected through in-depth interviews with communities that are affected by the COVID-19 pandemic and live around the fire-prone forest areas. The results of the observation were processed by descriptive analysis to get the conclusion. The results showed that about 72% of the affected people are carried out activities in forest areas which 78% of them did not understand the rules of forest and land fire hazards. The results of this study will be recommended to the government, particularly to the policymakers in controlling forest and land fires, especially during the Covid-19 pandemic.

1. Introduction
Forest and land fires are recurring almost every year in Indonesia and fluctuating from year to year. In the dry season, especially the extreme dry season (El Nino) that happened currently, forest/land and plantation fires occur in many places. The fires have scorched forests and land and have had impacts on various fields. Data from the Directorate of Forest and Land Fire Control of the Ministry of Environment and Forestry showed that the area of forest and land fires in Indonesia in the last three years is fluctuating. It is recorded that there was 529,266.64 ha of burned forest and land in 2018, 1,649,258 ha in 2019, and 64,600 ha until August 2020. In general, forest fires are caused deliberately by individuals and corporations because land clearing costs are quite expensive when it is done without burning.

The cases of intentional forest and land fires in South Sulawesi are generally performed by individuals with different motivations, from the high cost of zero burning land clearing, the volition to possess the forest land, and sabotage. It is in line with data from the Directorate of Specific Crimes of the National Police-Criminal Investigation Agency, which stated that as many as 121 people were suspected of forest and land fires crimes, which consist of 119 individuals and only two corporations. Specifically, in South
Sulawesi, the perpetrators of forest and land fires who have sufficient evidence are all becoming suspects, and those who have lack evidence will be released.

Forest and land fires are currently a major problem and must be managed carefully because the menace of forest and land fires occurs in the midst of the Covid-19 Pandemic, and both of them are targeting the respiratory tract. As the outbreak of Covid-19, the government has to switch most of the government's budget to fund the activities that prevent the transmission of Covid-19 to anticipate the spread of the virus. The government agency's activity budget is more focused on overcoming COVID-19, including the budget for forest and land fires management activities [1]. Therefore, it is required some particular strategies to control forest and land fires that adjust to current conditions. According to Bambang Hero Soharjo, a Professor of the Faculty of Forestry, IPB, the impact of Covid-19 can encourage people who do not have alternative incomes to increase the risk of land clearing by burning.

Barru Regency has an area that stretches from the sea to the mountains, and have some trees endemic [2]. The people's sources of income vary from construction workers, fishermen, farmers, civil servants to various skilled professions. Dryland farmers, outside and inside the forest area, are the majority profession of the people who live in the areas which are adjacent to the forest. Some of them tried their fortunes outside Barru Regency, and some even arrived in other countries known as Sompe. In 2019, during the outbreak of the coronavirus (covid-19), they came back to their hometown in Barru with various problems overseas, ranging from layoffs, drastically decreased salaries/wages, jobs that were irrelevant to current conditions, too many other reasons. Their arrival is the beginning of a disaster for the safety of the forest area because it is certain that most of them are looking for alternative livelihoods in the forest.

The question in this research is how far the Covid-19 pandemic affected the danger of forest and land fires in Barru Regency, South Sulawesi. The purpose of this study was to determine the effect of the covid pandemic on the dangers of forest and land fires in Barru Regency, South Sulawesi.

2. Literature review

2.1. Forest fires

Forest and land fires have become an annual recurring disaster, which the most common trigger is the community activities in cleaning their lands since burning is still considered as a low-cost method of land clearing. Forest and land fires also hit the region of Southeast Sulawesi, and according to Ahmad Akbar Fua (2019) [3], the causes were new land clearing, neglect, and cattle grazing. The performers of land clearing by burning generally argue that it has been done for generations, and the cost is relatively cheaper than the other methods. It is in line with the results of research that was conducted by Rahmad Dani, Defri Yozza, and Rudiana Sulaeman (2015) [4], which concluded that the socio-economic conditions that influenced the occurrence of forest and land fires in Rokan Hilir Regency were the levels of education and the culture of land clearing. People who have low levels of education, which are only elementary schools or uneducated, mostly stated that burning is the best method of land clearing, while the culture of land clearing by burning was mostly mentioned by people with low incomes. Aditiea Loren et al. (2015) [5] that the causes of forest and land fires in Kapuas Regency, Central Kalimantan are dominated by five factors, namely land clearing by burning, throwing cigarette butts, flammable dry fuel, fire jumps that come from other areas, and natural factors.

2.2. The relationship of covid-19 and forest fires

Deforestation leads humans to be very close to wildlife, and as a result, it is easier for wildlife to be caught for consumption or commercialization. The Centers for Disease Control and Prevention (CDC) is the Centers for Disease Control and Prevention, working to keep Americans and everyone elsewhere healthy. The CDC, in the Estelle Higonnet article [6], stated that some of the diseases that spread the virus were
originated from wild animals (zoonotic transmission), such as Zika in Brazil. The pathogen of the Zika virus that previously infected Chimpanzees, Gorillas, Orang Utans, and Baboons was then transmitted to humans through mosquito bites. The Ebola outbreak in Africa was transmitted to humans through direct contact with Chimpanzees, Gorilla, Orang Utans, Bats, Monkeys, and Hedgehogs, and HIV from Cameroonian Gorilla, Mers with the Corona Virus pathogen Mers-Cov transmitted to humans via Camels. Sars and Corona in China are transmitted by bats and ferrets. The H1N1 influenza virus known as Swine Flu is transmitted by Pigs, and the H5N1 influenza virus known as Bird Flu is transmitted by Poultry.

3. Research method
The research is located in Barru Regency with 70 respondents who are affected by COVID-19 and living in the villages around the forest areas. The determination of initial respondents was based on the information from local village officials, and the next respondent will be appointed by the previous respondent (Snowball method). Primary data will be obtained by conducting in-depth interviews with communities around forest areas in several areas in Barru Regency, while secondary data will be gained from reports on forest and land fires from the Office of the Technical Implementation Unit of the Makassar Climate Change and Forest Fire Monitoring Center as well as the Village Annual Report which serves as the target respondents. In addition, field observations will be carried out to obtain the actual picture in the field.

The proceeds of primary, secondary, and field observation data will be processed descriptively to summarize the results of the study. After data has been processed, it will be concluded whether the current pandemic influences the current forest fires or not.

The results of this study will become a recommendation to the government, in this case, policymakers who have control in forest and land fires management.

4. Result
Preliminary data:
A total of 70 respondents were interviewed, and all of them were residents who were affected by COVID-19. As many as 51 people (72%) of respondents are looking for alternative livelihoods in forest areas, and the rest prefer to work as sellers in the market, helping their families with farming, fishing, and other jobs (Table 1).

| Livelihood alternative     | Amount (Person) | Percentage (%) |
|----------------------------|-----------------|----------------|
| Seller                     | 8               | 11.43          |
| Farming                    | 5               | 7.14           |
| Livelihood in the forest   | 51              | 72.86          |
| Fisherman                  | 4               | 5.71           |
| Odd job                    | 2               | 2.86           |
| **Amount**                 | **70**          | **100**        |

Respondents were given questions about elements that can cause forest fires, such as smoking in the forest, putting off cigarette butts before throwing them away, cleaning up fires from cooking activities, and how to clear the lands in terms of time and technical security. As a result, there were 40 people (78%) out of 51 respondents who did not understand the rules of the forest fires hazards (Table 2).
Table 2. Understanding of respondents who choose livelihoods in the forest on the rules of forest fire hazard.

| Forest fire hazard elements | Understand | Do not understand |
|----------------------------|------------|-------------------|
|                            | Amount (Person) | Percentage (%)   | Amount (Person) | Percentage (%)   | Amount total |
| Smoking in the forest       | 9          | 17.65             | 42             | 82.35             | 51           |
| Putting out cigarette butts| 12         | 23.53             | 39             | 76.47             | 51           |
| Cleaning up the cooking fire| 14         | 27.45             | 37             | 72.55             | 51           |
| Land clearing technique     | 9          | 17.65             | 42             | 82.35             | 51           |
| Average                    | 11         | 21.57             | 40             | 78.43             | 51           |

5. Discussion

The Barru Regency consists of a 1,174.72 km² (117,472 Ha) area with various topography from sea areas, lowlands to highlands with an altitude of 1,500 meters above sea level. The population of Barru Regency is 169,302 people, with an average population density of 144 people/km². The majority population of Barru Regency is the Bugis tribe, which is famous for its nomad spirits. Therefore, some residents left Barru Regency to migrate to other areas and even abroad.

Some residents who migrated have returned to their hometowns due to being affected by COVID-19, and they prefer to find alternative livelihoods in the forest areas for some reasons like it is close to their settlements, lack of another job in the village since it has been filled by the old residents, and they must earn income before they run out of financial provisions.

The number of respondents who do not understand the rules of the forest fires hazards due to the lack of information, particularly since they were still overseas when the information was spread, will increase the risk of forest fires in Barru Regency. In this case, the forestry Extention conducted by forestry officers is expected to overcome this condition. However, currently, the officer's activities are limited by the COVID-19 pandemic regulations.

The high number of respondents who chose alternative jobs in forest areas, namely 72.86% (Table 1), was because they only arrived at a time when jobs that were relevant to current conditions in the village became a bone of contention for the local community. People who have just come from wandering only get jobs in the forest, so to make a living, they are forced to do this even though they may not be experts in that field.

The second-largest respondent is a seller (11.43%) because the job only requires money, but because there are too many people doing the selling job and each of them already has a subscription, making it difficult for respondents to complete.

Four activities endanger forest fires which were asked of the respondents, and their answers would endanger forest fires above 72% of all activities. This means that respondents have a large enough opportunity to threaten forest fires in Barru Regency.

6. Conclusion

In this study, it was found that the Covid-19 pandemic affected the danger of forest fires in Barru Regency because the impact of this pandemic resulted in Barru Regency people who migrated back to their hometowns. Most of the people who return home are looking for alternative livelihoods in the forest. Most
of those who are active in the forest do not understand the rules of the danger of forest fires, thus threatening forest fires in the Barru district.

Reference

[1] Rume T and Islam S M D-U 2020 Environmental effects of COVID-19 pandemic and potential strategies of sustainability *Heliyon* **6**

[2] Restu M and Larekeng S H 2016 Pollen Dispersal Patterns Eboni Lasitae Provenance Based On Simple Sequence Repeats *07* **3–7**

[3] Fua A A 2019 Ketika Puntung Rokok Jadi “Kambing Hitam” Kebakaran Hutan di Sulawesi Tenggara - Regional Liputan6.com

[4] Dani R, Yoza D and Sulaeman R 2015 Strategi Pemberdayaan Masyarakat Dalam Penanggulangan Kebakaran Hutan Dan Lahan Di Kabupaten Rokan Hilir

[5] Loren A, Ruslan M, Yusran F H and Rianawati F 2015 Analisis Faktor Penyebab Kebakaran Hutan dan lahan serta Upaya Pencegahan yang Dilakukan Masyarakat di Kecamatan Basarang Kabupaten Kapuas Kalimantan *J. EnviroScientiae* **11** **1–9**

[6] Higonnet E Pandemi Corona, Waktunya Aksi Nyata Setop Deforestasi dan Perdagangan Satwa - Mongabay.co.id : Mongabay.co.id