

# Identification of Factors Causing Forest and Land Fires in Tiwingan Lama Village Sub Watershed Riam Kanan, South Kalimantan

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## ABSTRACT

The decrease in forest function has occurred in the forest, especially in the sub-watershed area of South Kalimantan Riam Kanandue to fires that occur every year in the dry season. The existence of high technology in the fire management often neglect the perception of the villagers, as a result of which fires continue to occur and the management innovation practice has not obtained maximum results. In fact, it is known that fires always start from small land fires caused by human actions. To obtain answers in reducing the frequency of fire occurrence, the study of causal activity and fire prevention in Tiwingan Lama Village. The results showed that fire prevention activities so far have not resulted in a decrease in fire events. It is well known that the main sources of land fires in villages around the forest are livestock farming, fields and fishing, while other sources of fire are incidental. The community is open to receiving innovations in fire prevention education and training from the Management and Government. This study aims to analyze the factors that cause forest and land fires in Tiwingan Lama Village

*Key words* : Sub sub-Watershed Riam Kanan, Forest and land fires, The source of fire

## Introduction

The biggest and most detrimental cause of forest destruction is forest fires. Forest and land fires in Indonesia often occur during the dry season, namely in August, September and October, or during transitional times. Forest are as in Indonesia that have the potential to burn include on the island of Sumatra (Riau, Jambi, North Sumatra, and South Sumatra) and on the island of Kalimantan (West Kalimantan, East Kalimantan, and South Kalimantan). The causes of forest and land fires in Indonesia are generally due to two (2) factors. First, because of the human negligence factor that is carrying out its activities in the forest. Second, because of

the deliberate factor, namely the deliberateness of humans to open land and plantations by burning. The impact of forest fires in the form of smoke, the impact of smoke caused by forest fires can result in enormous losses both in terms of ecology, economy and social (Bahri, 2002). Data on forest and land fires from Manggala Agni Daops (Operation Area) Banjar, forest and land fires that occurred in Banjar Regency in 2015 is an area of 917.6 ha and in 2016 an area of 68ha, so that the total area of forest and land fires is 985.60 ha. Based on the data, Manggala Agni categorizes several locations into forest and land fire prone areas. One of the areas categorized as fire-prone areas is Tiwingan Lama Village, Karang Intan district, Banjar Regency. Tiwingan Lama village has

the potential for forest and land fires during the dry season. If forest and land fires occur continuously, and the efforts made by the community to reduce the risk of forest and land fire disasters are carried out only responsively to firefighting activities, then it can be used as a benchmark that forest and land fire control efforts from the community have been low.

## Materials and Methodology

This research was conducted in Tiwingan Lama Village, Karang Intan District, Banjar Regency, South Kalimantan Province, with a period of ±3 (two) months which includes stages ranging from preparation, observation in the field, data collection, data processing and analysis to the preparation of research reports. This research was conducted by collecting observation data directly on the field to the communities around forest and land fire prone areas in Tiwingan Lama Village and related agencies. The data required in this study are grouped into two primary and secondary data. Informants are determined based on purposive sampling techniques and snow ball sampling. The initial step of the informant is chosen based on a specific purpose (purposive) based on knowledge, experience, position related to **dalkarhutla** policy. Then based on information obtained from previous informants, researchers determined other informants who are expected to provide more complete data.

Data collection method used is descriptive method with a combination of primary data collection techniques through questionnaires (semi structural), interviews and participatory direct observation in the field to know the culture of society. The number of respondents is determined based on the Slovin formula.

$$n = \frac{N}{1 + Ne^2}$$

Description :

- n = sample number
- N = population number
- e = margin error

The data collected was recapitulated, partly on a *qualitative* scale and using content analysis, for strong data that is to measure the causative factors of forest and land fires *used chi square test*.

$$\chi^2_{hit} = \sum_{i=1}^k \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

Description:

$\chi^2$  : Chi Square

$O_{ij}$  (*Observed*) : Frequency obtained from the results of experiments (observation value) for the category to ij

$E_{ij}$  (*Expected*) : Frequency obtained from the results of the experiment (value harapan) for the category to ij

To find out the similarities of differences in factors causing forest and land fires and efforts to prevent forest and land fires carried out by the surrounding community, it was tested with chi square (Sudjana, 1992).

$$E_i = \frac{\sum O_i}{P(n)}$$

Description:

$E_i$  : Expected observations

$P(n)$  : opportunities from observation = 5

$\sum O_i$  : number of observations obtained

## Results and Discussion

Based on the results of the research that has been conducted, respondents with as many as 82 people gave different answers / responses related to the factors that cause forest and land fires in Tiwingan Lama Village. Recapitulation and percentage of interview results on the factors causing forest and land fires are presented in the following table.

Forest and land fires occur due to factors from human activities. Human activities that cause forest and land fires such as grazing, grazing, camp and hunting activities, fires from other areas (jumping fires), and other causative factors. Grazing activities in Tiwingan Lama Village have been carried out for a long time. Herded animals are buffaloes and cows. The farm animals are released in the forest or on the mountain. The number reaches hundreds of tails. According to respondents' information, this grazing involves several groups of local breeders. Grazing is the 1st contributing factor to forest and land fires with a percentage of answers (28.10%). Grazing activities, as shown in the image below:

Treatment of burning activities in grazing areas is due to get young and fresh grass. Burning is carried out when the grass and weeds in the area of grazing is not feasible to be consumed (old and dry) by the livestock, so in order to get the grass and young weeds back then the burning is carried out. Usually ±15 days after burning, grass and weeds will begin



Fig. 1. Cattle and buffalo grazing activities

to grow. According to Kasumbogo (2001) that the burning of grass and weeds in the dry season by farmers aims to stimulate the growth of grass and young weeds so that feed supplies for farm animals remain available. In addition, Tiwingan Lama Village has a tourist charm that is not a little to be visited by nature tourism. Beautiful tourist attractions such as matang Kaladan, Alimpung Park, Tiwingan Cliff, Rusa Island, Mandin Atawang will invite camping lovers to stay there. Camping activities are synonymous with bonfires. Fires, can occur when the bonfire is large enough and left until the morning. These bonfires can cause fires to jump when supported by strong winds and overly dry fuel in the dry season. Putung cigarettes that are thrown carelessly without extinguishing embers can cause a large fire if supported by weather hot enough that the surrounding fuel becomes dry. This is in line with Sarah Damayanti’s research, et all 2018. Fishing and hunting activities are one of the factors causing forest and land fires. According to respondents of fires caused by fishing, hunting is caused by the use of fire when fishing.

The use of fire in plantations is to accelerate the process of land preparation for planting activities. Land clearing carried out by farmers, as shown below

Land clearing is done by burning because of the easy and fast way to prepare the land. The stages carried out in the preparation of land are starting from the clearing until the land is ready to be used as planting media. Farmers do the slashing first and then the slash is left for ±2 weeks which aims to dry the slash and facilitate the combustion process. Farmers also know about the prohibition and sanctions of land burning activities, but if farmers do land clearing in a way without burning and only release it will take a very long time, because the land cannot be planted because of the many slashes that



Fig. 2. Land Clearing

Table 1. Percentage Fire Causative Factors on Forest and Land in the village

No.	Fire Causative Factors Forests and Land	Amount	Percentage (%)
1	Plantation	27	22.31
2	Grazing	34	28.10
3	Camp, hunting, fishing	30	24.79
4	Fire from other areas	16	13.22
5	Other causal factors	14	11.57
	<b>Total</b>	<b>121</b>	<b>100</b>

still accumulate

Fires from other regions are the fourth contributing factor to forest and land fires with a percentage of respondents' answers (13.22%). According to respondents, the spread of fire from other regions is very detrimental if it gets to spread to people's agricultural land. If the fire spread to agricultural land, it will burn the farmers' crops so that the crops are damaged and die. The cause of the spread of fire from other areas can be caused by negligent farm use of fire, illegal fire spread from burning activities in grazing areas, cigarette butts and or from camp activities that use fire. Unknown factors in this study can be intentional factors and is a factor of a person's disrespect for the circumstances or policies that occur in the sub-watershed area of Riam Kanan which is dominated by the Area of Tahura Sultan Adam. According to some respondents the fire could suddenly become a large fire without knowing the cause. Some respondents have found traces of burning mosquito repellent around the fire site. This is a marker that forest fires can also be caused by a "D" factor rather than a "T".

Local workers involved with Das's rehab activities want payment in the field without constraints, if the r Adam (respondents)

In order to keep reality is not as expected, then it can be a factor of one's disrespect of activities in Tahura Sultan Das's rehab activities going, one way is to extend watershed rehab activities in a village. (respondents)

Other contributing factors in Tiwingan Lama Village came in last place. This is possible due to the involvement of local communities in watershed rehab activities. Community involvement in an activity in a region can slightly dampen the friction that is most likely to occur. In Tiwingan Lama Village, watershed rehab is also carried out by IPPKH PT. TIA (Tunas Inti Abadi) with an area of 1336 ha since 2015 and PT Adaro covering an area of 278 ha. In the

implementation of Das Rehab in Tiwingan Lama Village, PT TIA involves many local residents as its workforce. The community is fostered with several activities including nursery activities for the provision of seeds in watershed rehab activities, Kelulut honey farms, goat farms, agro tourism.

Based on the results obtained, then the *Chi Square* test ( $X^2$ ) to find out the causative factors of forest and land fires is presented in Table 4.8.

Based on the results of Chi Square test calculation in Table 9, then obtained  $X^2$  Calculated value of 12,760 and when compared to  $X^2$  Table ( $dk= 4, \alpha= 5\%$ ) 9.48. It turns out that  $X^2$  calculates greater than the  $X^2$  Table, then  $H_0$  is rejected and  $H_1$  is accepted. That means there is a difference from each respondent's answer about the factors causing forest and land fires. This means that of the 5 parameters tested about the causative factors of forest and land fires have an influence on forest fires and different land. The biggest influence that causes forest and land fires from the 5 parameters is grazing.

## Conclusion

The cause of forest fires in Tiwingan Lama village is caused by factors (1) camp, hunting, fishing (24.79%); (2) Other Causative Factors (11.57%); (3) Grazing (28.10%), (4) Farm (22.31%) and (5) Fires from other regions (11.32%). Technology innovations that can be adopted by the people of Tiwingan Lama Village so that people can change the tradition of burning with the application of land clearing technology without burning with economic pattern.

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**Table 2.** Test *Chi Square* Factors of Forest and Land Fire Cause

No.	Fire Causative Factors Forests and Land	O <sub>i</sub>	E <sub>i</sub>	O <sub>i</sub> -E <sub>i</sub>	(O <sub>i</sub> -E <sub>i</sub> ) <sup>2</sup>	(O <sub>i</sub> -E <sub>i</sub> ) <sup>2</sup> /E <sub>i</sub>
1	Plantation	27	24.2	2.8	7.84	0.324
2	Grazing	34	24.2	9.8	96.04	3.969
3	Camp, hunting, fishing	30	24.2	5.8	33.64	1.390
4	Fire from other areas	16	24.2	-8.2	67.24	2.779
5	Other causal factors	14	24.2	-10.2	104.04	4.299
	Total	121	121			12,760



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