

*Research Article*

# Community Efforts in Fire Disaster Mitigation in Jelutung District, Jambi Province

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**Abstract**

One of the efforts to prevent or minimize the potential impact of fire disasters in the future is mitigation and preparedness for fire disasters. Fire incidents in Jambi City in 2019 occurred in Jelutung District as many as 14 cases. The purpose of the study was to determine the role of the community in mitigating fire disasters. This research design is cross sectional. The research was conducted in Jelutung District. The research sample is the community in Jelutung District as many as 94 people taken by purposive sampling technique. Data collection techniques by interview using a questionnaire. Data were analyzed using chi square test. As many as 35.1% of respondents have poor fire disaster mitigation efforts, 43.9% of respondents have poor knowledge, 40.4% of respondents have poor attitudes, 42.6% of respondents have poor disaster warning systems. Bivariate results show that there is a relationship between knowledge (p-value = 0.000), attitudes (p-value = 0.000), disaster warning systems (p-value = 0.000) and fire disaster mitigation efforts. Fire disaster mitigation efforts in Jelutung Regency are related to knowledge, attitudes, and warning systems. It is hoped that the Jambi City Fire Service will always provide education about fire disaster mitigation.

**Keywords:** Disaster; fire; mitigation

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**1. Introduction**

Disaster according to the Law of the Republic of Indonesia No. 24 of 2007 concerning disaster management which states that a disaster is an event or series of events that threatens and disrupts people's lives and livelihoods caused, both by natural and/or non-natural factors as well as human factors, resulting in human casualties, environmental damage, property losses, objects and psychological impacts (Undang Undang Nomor 24, 2007).

Fire disaster management is a process, method, the act or effort made in dealing with fire disasters, where fire hazard is a general indications that cause fires and factors that cause fires and overcome the level of difficulty fire control, especially if there is a large fire that can paralyze community activities and suffer huge losses (Hendayana, 2019).

One of the most important efforts in preventing and overcoming fires is to minimize the impact of the fire with the knowledge that exists in the community, how to prevent it, as well as the countermeasures are. In the process of forming an action (overt behavior) knowledge is very decisive domain. Main and key factors preparedness is knowledge. Knowledge affects attitude and concern for preparedness. Knowledge of disasters, symptoms, causes and what to do to do in case of fire is a basic indicator of a knowledge in preparing fire preparedness. The frequency with which a person gets knowledge or information about preparedness can be a factor preparedness behavior. (Wenta Chris Omega Manik & Bina Kuniawan, 2020).

Research conducted in the district of Tasikmalaya shows that there are 17 districts that are prone to fire disasters, namely 117 cases. Depok City BPBD data in 2022 shows that the number of fires in Depok City for the period from January to June there were 71 fire cases, the majority of which were caused by electric short circuits, while in Bandung City there were 116 fire cases caused by electrical shorts.

This study is in line with (Laila Fitriana & Suroto, 2017) research which shows that there is a relationship between knowledge and preparedness efforts of production department employees in the face of fire hazards (p-value = 0.009). The results of the study (Manik, W.C.O., Kurniawan, B. & Wahyuni, 2020) showed that there was a relationship between knowledge and the preparedness of traders in fire prevention efforts (p-value = 0.025). The results of the study (Suzana Indragiri, 2016) show that there is a relationship between attitude and fire prevention efforts (p-value = 0.035).

According to (Pusponegoro, A. D., & Sujudi 2016) disaster mitigation is an action or effort through various means, to prevent a disaster from occurring or at least reduce its effects. Mitigation efforts include Knowledge possessed by a person can influence attitudes and concerns to be ready to anticipate disasters. The importance of preparedness is one of the important elements of proactive disaster risk reduction prevention activities before a disaster occurs (Pusponegoro, A. D., & Sujudi, 2016). Based on the results of research conducted by (La Asiri 2020) , it shows that public knowledge in the disaster mitigation process has been going well, it's just that the supporting facilities and infrastructure are limited, the community already has awareness with a good attitude to participate in disaster mitigation and disaster response activities, emergency response the disaster carried out by the Fire Department has not been maximized, the post-disaster rehabilitation and reconstruction stage is the authority of other agencies, in this case the Social Service and Regional Disaster Management Agency (La Asiri, 2020). Based on data obtained from the Jambi City Fire Department, this study aims to knowing the level of knowledge, attitudes, and disaster warning systems in the community in mitigating fire disasters in Indonesia Jelutung District.

## 2. Methods

The amount of each material that has been composted can be determined based on the C/N ratio of each material. The C/N ratio is one of the factors that affect the composting process (Mortier et al, 2016). The levels of C and N and the ratio of C/N have been presented in **Table 1**.

**Table 1.** Characteristics of Each Compost Material

No.	Compost material	C-organic (%)	Nitrogen (%)	C/N ratio	Moisture content (%)
1.	Fish mackerel waste (FMW)	21.38	4.16	5.14	48.91
2.	Angsana Leaves (AL)	18.21	0.55	33.11	66.2

### 2.2. Determination of the Compost Composition

This research is a quantitative research using a cross sectional research design. Researchers use this method because it only looks at the relationship between knowledge, attitudes and disaster warning systems. In addition, data collection is only done once and at the same time. The cross sectional method is the easiest to do when compared to other methods The independent variables are attitudes, knowledge and early warning systems, while the dependent variable is disaster mitigation in the face of fire disasters.

The attitude in this study is the respondent's response to disaster mitigation measured by a questionnaire and categorized into less good and good, the knowledge variable is everything that is known by the respondent about fire disaster mitigation in the poor and good category, the disaster warning system variable is a warning against hazards. fire disasters are categorized into less good and good. The population in this study was the entire community in Jelutung District as many as 3,449

families and sampling was carried out by purposive sampling technique as many as 94 respondents. The sample inclusion criteria included the head of the family in Jelutung village, willing to be a respondent, able to communicate well, over 17 years old. The instrument used in this research is the distribution of questionnaires and interviews. The distribution of the questionnaires was carried out at the time of data collection by conducting interviews. The results of the study was analyzed univariately and bivariately using the Chi-Square statistical test.

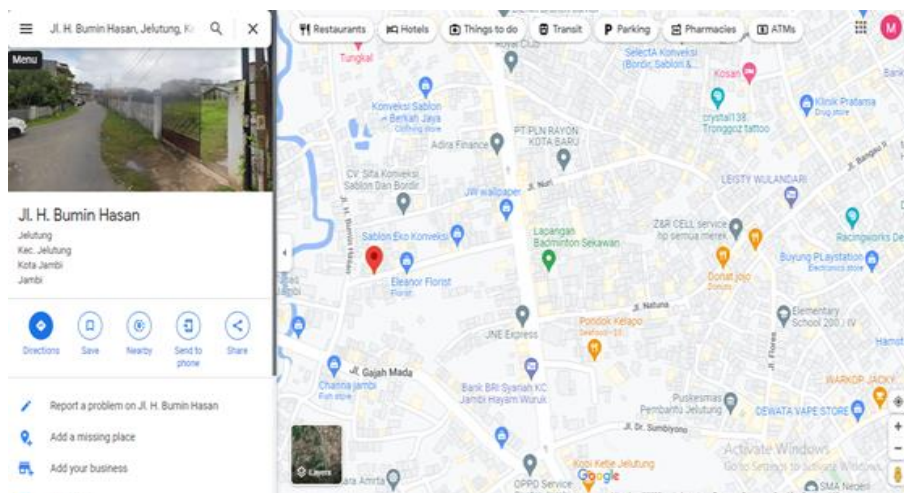


Figure 1. Research location

The incidence of fires in Jambi province based on data obtained from the Jambi City Fire Department shows that the number of fire cases from 2015 to 2019 was 523 cases of which 188 cases were fires that occurred in public housing. The biggest cause of fires was an electric short circuit, gas cylinders ranked second, followed by candles and cigarettes. Data on fire cases in the city of Jambi for the last four years recorded that in 2015 there were 181 cases of fire, and in 2016 there was a decrease of 69 cases, in 2017 there was a further decline of 58 cases, but in 2018 there was an increase again by 85 cases, there was an increase again in 2019 with quite a number high of 130 cases. (Jambi City Fire Department).

Based on data from the Jambi City Fire Service, in 2015 there were 62 new fires in urban villages, in 2016 in Telaipura sub-district there were 11 cases, and in 2017 10 cases, while in 2018 there were only 15 fire cases in Jelutung sub-district. 2019 there were 14 fire cases

The number of fire cases most often occurred in Kota Baru and Telanai Pura sub-districts and lastly in Jelutung sub-district. Causes of fires can come from gasoline, electricity. Based on fire data and recapitulation from the Jambi City Fire Department, Jelutung Regency, there has been an increase in the incidence of fire disasters since the last 4 years with losses reaching Rp. 165,000,000.

From the results of statistical data reports from the Jelutung sub-district obtained from the Jelutung Sub-district Office, Jambi city, Jelutung District has a total of 60 RTs and a total of 3,449 KKs

Housing ranks highest in terms of fire incidence in Indonesia. Apart from the high fire load, it is also caused by the high density of buildings. This type of fire generally causes significant losses to the occupants, and it often results in fatalities. This statement supports the importance of disaster mitigation education by the community (Mantra 2005)

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Based on a preliminary study of 10 communities in Jelutung Village, Jambi City, it was found that 6 people knew about mitigation and 4 people did not know about mitigation. Based on the results of observations of the conditions of settlements in RT. 25 Jelutung District, has a high density of buildings. Types of characteristics of residential building materials are divided into two groups, the first is the type of permanent house, namely the house that has fire-resistant materials (type of wall house) and the second is the semi-permanent house, namely the house that uses a lot of wood material, which for this type of house is a vulnerable house against fire.

### 3. Results

**Table 2.** Description of knowledge, attitudes, disaster warning systems and fire disaster mitigation efforts

Variable	frequency	Percentage
Disaster Mitigation Efforts		
Not good	33	35.1
Well	61	64.9
Knowledge		
Not good	41	43.9
Well	53	56.4
Attitude		
Not good	38	40.4
Well	56	59.6
Disaster Warning System		
Not good	40	42.6
Well	54	57.4

The table 1 shows that from 94 respondents there are 33 (73.7%) respondents have poor fire disaster mitigation efforts and 61 (64.9%) respondents have good fire disaster mitigation efforts. of 94 respondents there are 41 (43.9%) respondents have poor knowledge and 53 (56.4%) respondents have good knowledge. out of 94 respondents there are 38 (40.4%) respondents have a bad attitude and 56 (59.6%) respondents have a good attitude. out of 94 respondents, 40 (42.6%) respondents stated that the disaster warning system was not good and 54 (57.4%) respondents said the disaster warning system was good.

**Table 3.** Relationship of knowledge, attitude, disaster warning system with fire disaster mitigation efforts

Variable	Disaster Mitigation Efforts		Total	p
	Low %	Currently %		
Knowledge				
Not good	32	78.0	41	0.000
Well	1.9	52	53	100
Attitude				
Not good	32	84.2	38	0.000
Well	1	1.8	56	100
Disaster Warning System				
Not good	26	65.0	40	0.000
Well	13.0	47	54	100

The results of knowledge analysis with fire disaster mitigation efforts in Jelutung District showed that of the 41 respondents who had poor knowledge there were 32 (78.0%) respondents who had poor fire disaster mitigation efforts and 9 (22.0%) respondents have good fire disaster mitigation efforts (See Table 2). Of the 53 respondents who have good knowledge, 1 (1.9%) respondent have poor fire disaster mitigation efforts and 52 (98.1%) respondents have good fire disaster mitigation efforts. The

results of statistical analysis obtained  $p\text{-value} = 0.000$ , so it can be concluded that there is a relationship between knowledge and efforts to mitigate fire disasters in Jelutung District, Jambi City in 2021.

The results of attitude analysis with fire disaster mitigation efforts in Jelutung District showed that of the 38 respondents who had a bad attitude, there were 32 (84.2%) respondents who had poor fire disaster mitigation efforts and 6 (15.8%) respondents had disaster mitigation efforts. good fire. Of the 56 respondents who have good attitudes, there are 1 (1.8%) respondents who have poor fire disaster mitigation efforts and 55 (98.2%) respondents have good fire disaster mitigation efforts. The results of statistical analysis obtained  $p\text{-value} = 0.000$ , so it can be concluded that there is a relationship between attitudes and efforts to mitigate fire disasters in Jelutung District, Jambi City in 2021.

The results of the analysis of the disaster warning system with fire disaster mitigation efforts in Jelutung District showed that of the 40 respondents who had an unfavorable disaster warning system, 26 (65.0%) respondents had poor fire disaster mitigation efforts and 14 (35.0%) respondents have good fire disaster mitigation efforts. Of the 54 respondents who have a good disaster warning system, there are 7 (13.0%) respondents who have poor fire disaster mitigation efforts, and 47 (87.0%) respondents have good fire disaster mitigation efforts. The results of statistical analysis obtained  $p\text{-value} = 0.000$ , so it can be concluded that there is a relationship between the disaster warning system and fire disaster mitigation efforts in Jelutung City District Jambi in 2021.

#### 4. Discussion

Based on the results of the study, it showed that most of the respondents had poor fire disaster mitigation efforts, poor efforts were due to the respondents' lack of participation in disaster mitigation efforts and the lack of awareness from the public that disaster mitigation could reduce the risk of fire.

Based on the results of the study, it was found that  $p\text{-value} = 0.000$ , indicating that there is a relationship between knowledge and efforts to mitigate fire disasters in Jelutung District. Knowledge affects the community in disaster mitigation efforts. The better the knowledge, the better the fire disaster mitigation efforts and the lower the community knowledge, the lower the community's efforts in mitigating fire disasters. (Beni Hari Susanto, 2021).

This research is in line with the results of research conducted by Cahyani (2020) which states that the level of preparedness of the Kampung Pelangi community is in the less prepared category. The lack of community preparedness in dealing with fire disasters is caused by inhibiting factors, namely internal factors such as the lack of community knowledge about physical vulnerability and economic vulnerability, lack of community initiative to save emergency telephone numbers, the community does not provide a first aid kit, does not have preparedness materials, and does not have special savings. disaster and the external factor is the lack of training and simulation of disaster preparedness. (Yulia Fegy Cahyani, 2020).

One of the efforts to prevent or minimize the potential impact of fire disasters in the future is mitigation and preparedness for fire disasters. Mitigation is a form of a series of efforts to reduce disaster risk in both structural and non-structural forms in dealing with disaster threat (Fauzi, Miladan, and Utomo, 2021). Main focus of mitigation activities is to reduce the risks/impacts caused by disasters, especially for population, such as fatalities (deaths), economic loss and resource damage natural resources and improve community knowledge in confront and reduce impact/risk of disaster, so that people can live and work with safe (La Asiri, 2020).

The form of fire disaster mitigation by the community is not using branched electrical devices to minimize electrical shorts and always checking electrical devices regularly, knowing the standards for using liquefied petroleum gas and maintaining the condition of gas and stoves, avoiding flammable equipment from the reach of children such as candles, matches. fire. Apart from that, there is training on how to put out a fire, how to connect hose from car firefighter. Method using traditional equipment like using a burlap sack moistened. on the fire lit in the drum. Training attended by representatives from each resident in harmony male-dominated neighbors man. Training is one of the means for improve



knowledge, skills and so that when doing blackout activities can keep himself well and avoid injury. (Oktaviansyah E, 2012).

Based on the results of the study,  $p$ -value = 0.000, it shows that there is a relationship between knowledge and efforts to mitigate fire disasters in Jelutung District. The results also show that there are respondents who have good knowledge, but fire disaster mitigation efforts are not good, this is because respondents have poor awareness, respondents think that so far there has been no fire disaster, so they feel no need to make mitigation efforts.

If the public's knowledge of preparedness fire disasters both in terms of hazard, vulnerability, risk and risk reduction activities are adequate it will be able to create effective community action (either individually or in collaboration with other other stakeholders) in dealing with disaster. Disaster-ready families can help improve community resources by prepare an independent family. (Baker, L. R., & Cormier, 2012).

Respondents who have good knowledge tend to have good fire disaster mitigation efforts. Respondents received knowledge or information about fires and fire prevention methods from the Jambi City Fire Department. The Fire Department has carried out socialization of fire disaster mitigation so that it can increase the knowledge of respondents. Respondents also get fire prevention information from the mass media so that respondents have good knowledge. Good knowledge about fire disaster mitigation affects the behavior of respondents to better fire disaster mitigation. Respondents who have poor knowledge are more likely to have poor fire disaster mitigation efforts. Respondents who do not know the causes of fires, how to prevent and control fires, will have poor efforts in mitigating fire disasters. Knowledge is one of the factors that exist in community preparedness in dealing with disasters, knowledge becomes the basic aspect of preparedness must be owned by every society, in order to provide information to family members when a when a disaster occurs. Knowledge of the community can usually affect attitudes and concerns family to be ready and alert in anticipating occurrence of disasters, especially for those who live in live in an area prone to natural disasters. (Dantzler, 2013).

Knowledge of disasters, their symptoms, causes and what to do in the event of a fire is a basic indicator of knowledge in preparing fire preparedness (BNPB, 2012). The results of the research on attitudes towards fire disaster mitigation efforts in Jelutung District obtained  $p$ -value = 0.000 so that it shows that there is a relationship between attitudes and fire disaster mitigation efforts in Jelutung District. Community preparedness for fires grouped into several parameters, one of which is is attitude. Parameters of people's attitudes of each individual/household is a necessary anticipatory picture carried out in the event of a fire. Attitude in the family too become one of the factors that influence society in preparing themselves in preparedness activities disaster. There are two components of the attitude factor in family, first involves the perception of risk, second involve previous disaster experiences. (Baker, L. R., & Cormier, 2012).

People who have better knowledge associated with disasters that occur tend to have better preparedness than people who minimal knowledge. Communities who have good knowledge of fire fighting in the attitude of preparedness will have preventive measures good firefighting. (Pahriannoor et al., 2020). Through this disaster warning, the community can take appropriate action to reduce casualties' lives, property and environmental damage. People in the Banjarmasin Pekauman area has available sources information for fire disaster warning, determine evacuation route or assembly point in the event of a fire. Point Gathering is one of the important elements in disaster management, determination of gathering points for evaluation should be established as a preparedness measure. So far the Pekauman community has made it very easy get fire information whether it is obtained from government and social media. (Gowing et al., 2017).

This study is in line with research (Ayu et al., 2021) which shows that there is a relationship between attitude and preparedness in dealing with fire disasters in Islamic boarding schools ( $p$ -value = 0.000). The results of the study (Manik et al., 2020) showed that there was a relationship between the attitude and preparedness of traders in fire prevention efforts ( $p$ -value = 0.028). The results of the study

(Hilmi 2020) show that there is a relationship between attitudes and disaster management efforts in Tempuran District (p-value = 0.000).

This study is in line with the research of Friska Ayu and Ratna Ayu Ratriwardhani (2021) showing that there is a relationship between attitude and preparedness in dealing with fire disasters in Islamic boarding schools (p-value = 0.000) (Ayu et al., 2021). The results of Manik, et al (2020) research show that there is a relationship between attitudes and traders' preparedness in fire prevention efforts (p-value = 0.028)(Manik et al., 2020). The results of Sefi Aqif Hilmi's research (2020) show that there is a relationship between attitudes and disaster management efforts in Tempuran sub-district (p-value = 0.000) .(Hilmi, 2020).

Research conducted by Magdalene Goemane and Patricia Ballamingle shows that disaster experiences affect people's knowledge, resulting in greater willingness to engage in fire mitigation strategies .(Magdalene Goemans, 2012). Gehan Mohammed Diab research results and Sohair M. Mabrouk showed that there was a relationship between knowledge and attitude towards disaster management (p-value < 0.01) (Diab and Mabrouk, 2015).

Preparedness attitudes are actions that taken to reduce disaster risk. Attitudes determine how individuals and households make response or react to a disaster situation. Attitude that are both shaped and influenced by knowledge. The purpose of the importance of disaster education is to: instilling a responsive and responsive attitude towards disasters so that fatal risks can be avoided and expected people not only know and understand the concept of disaster, but the most important and foremost is how do they deal with disaster risks in a prepared manner so that they are able to minimize more impact worse than fire disaster (Trifianingsih et al., 2022).

The community has a positive attitude towards disaster preparedness and the attitude assessment is higher than the community's knowledge of disaster preparedness.(Cahyadi Adiwijaya, 2017). The results showed that there was a relationship between attitudes and efforts to mitigate fire disasters in Jelutung District. Knowledge and good attitudes from the community affect community behavior efforts in responding to fire prevention efforts and increase community anticipation in the event of a fire. Respondents assume that every family must have rescue equipment and evacuation routes, have knowledge of fires, always maintain household equipment that can cause fire sources, every member of the community is involved in preparation and planning for disaster risk reduction in the environment.

The results also show that respondents who have a good attitude, but fire disaster mitigation efforts are not good, this is due to the lack of available fire extinguishing facilities such as the absence of Extinguisher Light Fire or water storage device. In accordance with Green's opinion in (Notoatmodjo 2012) for the realization of attitudes into real actions, supporting factors or conditions of supporting facilities are needed (Notoatmodjo 2012). For this reason, the Jelutung Village should make a planning for the procurement of hydrant facilities so that they can be used by the community in the event of a fire disaster.

Based on research on the disaster warning system in Jelutung Village, it was obtained p-value = 0.000 which indicates that there is a relationship between the disaster warning system and disaster mitigation efforts. The better the disaster warning system, the better the fire disaster mitigation efforts and the worse the disaster warning system, the less good the fire disaster mitigation efforts carried out by the respondents. One of the fire warning systems in Jelutung District is using loudspeakers in mosques, kentongan, in the event of a fire residents give warnings to the surrounding community to be ready to face disasters, each location in Jelutung District coordinates with related parties in the event of a fire.

The results also show that there are respondents who have a good disaster warning system, but fire disaster mitigation efforts are not good as many as 7 (13%) respondents, this is because respondents have less self-confidence, respondents are not sure they are able to mitigate because they do not have the expertise and experience in dealing with fire disasters. Respondents who have a poor disaster

warning system but have good fire mitigation efforts, this is due to the support from their families to always make fire prevention efforts.

The disaster warning system is a very important element in disaster risk reduction efforts. With a disaster warning, the community can make an appropriate response to save and avoid casualties and reduce the impact of the disaster. Volunteer Row Fire is one of the efforts formed by the community to overcome when a fire occurs, but the volunteer ranks are often inactive due to the management the number of members formed is too small and it is hoped that community participation in participating in prevention and fire fighting organized by department firefighter and rescue (Rogo Sukmo, Suroto, 2016)

Research in Kapas Madya Baru on fire disaster risk reduction in residential areas shows that the risk of fire disasters can be prevented with a good organizational system. The system implemented starts from resources (both human and infrastructure) and methods of disseminating information. Local officials use WhatsApp media to disseminate information and use loudspeakers in the event of a fire (Argarin and Yusuf, 2020). Based on research conducted by Rogo Sukmo, 2016 on the implementation of rapid emergency response, if there is a fire, the community will use Smart Alarm in the form of the means used to contact the fire service quickly because it has a path own communication.(Rogo Sukmo, Suroto, 2016). Based on the results interview that there is no fixed procedure when it happens fires, residents tend to save things in his house, especially important letters. People still can't do a lot of things when they happen fire due to fire ever happened.

## 5. Conclusion

The results of fire mitigation research in Jelutung Village can be concluded that most of the respondents have good knowledge, good attitudes, and a good disaster warning system. disaster mitigation in jelutung village is related to knowledge, attitude, and disaster warning system (p - value < 0.01). From these conclusions, it is suggested that the Jambi Provincial Government empowers the community about disaster mitigation so that the community's knowledge and skills regarding fire disaster mitigation increase and can apply it in daily life. for the community to always make efforts to mitigate fire disasters so that fire disasters do not occur such as storing flammable liquids (gasoline, diesel, kerosene) in a safe place, tidying up electrical installations, not throwing cigarette butts carelessly, when cooking do not leave the stove or fire in the oven. the on and off state when traveling or when no one is home.

## Acknowledgements

The researcher would like to thank Jelutung Sub-district which has given permission to the researcher to conduct research in Jelutung District and the researcher would like to thank the community who have become respondents in this study.

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