

Community empowerment – based communication pattern to prevent forest and land fires

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Abstract. The rise of devastating impacts of climate change has reached an urgent situation that we must act immediately to combat these problems. As the 13th sustainable development goal focused on climate actions. Bengkalis Regency as one of the highest potentials for land fire has become one of the biggest contributors to air pollution and land fire in Riau province, Indonesia. The role of Masyarakat Peduli Api (MPA) (Anti Fire Community) is to prevent those problems mainly focused on the society to combat the climate impact specifically air pollution and land fire in Bengkalis regency. The purpose of this research is to design a communication pattern for the prevention of forest and land fires based on community empowerment in Desa Wisata, Bukit Batu, Kab. Bengkalis. This study uses a Participatory Rural Appraisal (PRA) by generating village mapping, season calendar, village tracing, Venn diagram, changes and trends analysis, and metrics ranking. The subject in this study were Anti Fire Community Bengkalis regency, visitors, and the public in general. The result showed that communication pattern is required to pursue effective collaboration between all parties to combat the impact of climate change. Moreover, the action that done by MPA has become one of preventive action to solve land fires.

1 Introduction

Indonesia is the largest archipelagic state in the world, with more than 17.500 islands and more than 81.000 kilometers of coastline with 270.6 million population. Indonesia was Southeast Asia largest economy until 2019 [1]. Climate change is one of crucial problem that exist in the world today. The rise of many devastating impacts of this problem such as global warming, rising sea levels, extreme weathers, etc. requires us to take actions immediately. The impacts that happened in Indonesia such as increasing temperatures throughout the country, changes in rain pattern and so on [2].

The year 2015 was the most horrendous fire season on record in Indonesia [3]. Riau Territory was one of the five areas in Indonesia that was generally impacted by fire in 2015 [4]. The all out burn region in Riau Territory showed by hotspot analysis is reported is

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accounted for to be around 90,709 km², which is around 19.02% of the absolute consumed region in Sumatra Island [5].

Perception is the essence of communication, because it deals with the interpretation of meaning or explanation of information. Stakeholder have their separate view of the reasons for Karhutla in Riau. Karhutla in Riau is brought about by many elements, all of which allude to human way of behaving both straightforwardly and in a roundabout way. The prompt reason is human's burning deliberately or inadvertently. The deliberate activity is performed to the clearance of agricultural land and plantations. The unexpected is normally executed by the fishers in the waterway or channels around the inclined region. Moreover there is the cultivator who made the pit fire, then, at that point, neglect to switch the open air fire off until it causes a fire [6].

Peatland fires add to ozone depleting substance emanations, intensify environmental change, jeopardize human wellbeing, and cause financial misfortune [7]. Bengkalis Regency in Riau Province in Indonesia is one of the areas that prone to land fires especially in their peatlands. Peatlands are normal biological systems that contain put away biomass from biomass stores beginning from past tropical bog vegetation that has not been disintegrated. Burning peatlands will consume an immense measure of biomass and flames that are hard to quench [8].

In ongoing many years, these flames likewise have turned into a wellspring of tragic haze because of the consuming area and covered with an exceptionally thick peat, which came about the fire toward the end in longer time and not handily doused [9]. It is important to go to proper field lengths of ecological circumstances to forestall and oversee woods and land fires and to limit their unfavorable effects [10]. The efforts taken to handling forest and land fires required cross – sectoral coordination and participation to support the activities. The community's unity makes managing land fires more viable. Community resilience to catastrophes upholds and empowers networks to make due in misfortune inclined areas. The capacity to adjust, government support [11].

The party involved are regional government, Corporate Social Responsibility (CSR), local community and Masyarakat Peduli Api (MPA) (Anti Fire Community). Community empowerment is an idea of monetary improvement that exemplifies social qualities. The expected improvement isn't simply the economy yet in addition eminence, respect, fearlessness, and confidence. The reasoning for community empowerment is that endeavors ought to be aimed at the foundation of the issue to work on individuals' capacity [12]. Implementation of local community-based empowerment needs to be researched, because empowerment, in general, does not emphasize the insights or habits of the empowered local people. The fire risk location map can be seen in Fig. 1.

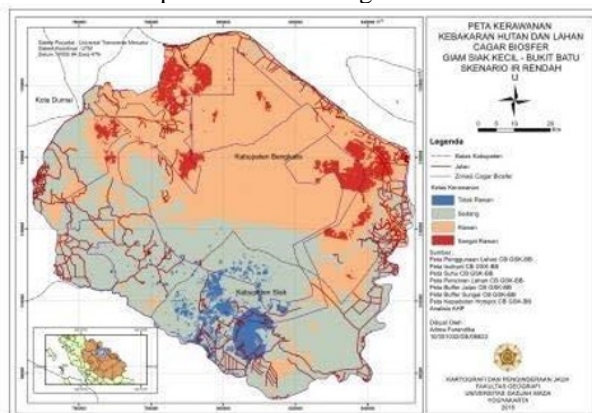


Fig. 1. Fire risk location map.

In solving the problems, multiple stakeholders collaborate to combat the impact of climate change such as through corporate social responsibility, government, and private sector contribution to deal with climate change. In this village has made a community called Masyarakat Peduli Api (MPA) (Anti – Fire Community) which took action in preventing forest fire disaster in the area.

The connection among human and the environment is the subject of interest for the majority gatherings that vibrate answerable for the state and nature of the encompassing nature [13]. Botches in communicating, could prompt vulnerability which irritated the circumstance. In this present circumstance, communication and community empowerment approach is critically required, considering the conditions and social change [14]. Forest and land fire management efforts are intended to decrease the event of flames that might influence life and vocations. Fire characteristics, recurrence of event, weather conditions factors and spread of fire signs by biophysical elements and human exercises are required as contributions for the improvement of early advance notice frameworks of backwoods and land fires in a specific district. Likewise, the reasons for backwoods and land fires connected with human exercises should be appropriately recognized so their administration techniques can be resolved fittingly and actually. In this manner, the qualities and reasons for flames should be resolved properly in every district [15].

2 Methods

This study was conducted with qualitative approach by using Participatory Rural Appraisal (PRA) by generating village mapping, season calendar, village tracing, Venn diagram, changes and trends analysis, and metrics ranking. PRA is an action research method which developed to increase community participation in development. Data were obtained with PRA technique such as:

1. **Village Mapping:** Analytics tool which facilitated the community to discover village environment and its situation. The output of village mapping in a form of map in order to understand the environment and general resources better within the village.
2. **Season Calendar:** Analytics tool which monitored repetitive activities and situation in certain amount of time (season). The purpose of this calendar is to identify community pattern and their situation. The output of this calendar is to acquire community main activity throughout the year.
3. **Village Tracing:** PRA techniques which acquire researcher to observe directly existing resources and the environment within the community by tracing the village area by following certain tracks chosen.
4. **Venn Diagram:** PRA techniques that used to identify the connection between organizations that exist in the community. Venn Diagram portrayed in a circle form which showed the reach of impact, benefits and the connection proximity between organization and community.
5. **Changes and Trends Analysis:** PRA techniques that give picturization about existing changes in different situations in the community in different time. The community able to observe tendencies of changes happens whether increasing or vice versa.
6. **Metrics Ranking:** PRA technique to identify topics within the community by giving value to each aspect depends on the weighing criteria. The purpose of this metrics is to be facilitating and encourage the community thinking determine the topics that already existed. Therefore, it would give a picturization based on rank depends on their consideration and situation together.

In this method, researcher as facilitator which accommodated the community in this research. Through high amount of participation, villagers that are involved in PRA can have the important role in this research such as involved in obtaining the data, arrange budget allocations, formulate the program, generate details in the event and implementation. As facilitator, PRA is a success if people are motivated and actively participated in this research.

Furthermore, this study obtained data from informants by using purposive sampling. Informants' category in this regard such as:

1. Key informant: Key informant is a person or community which understand deeply about the problems in this research. Therefore, in this research is Masyarakat Peduli Api (MPA) (Anti – Fire Community) at Desa Bukit Batu, Bengkalis Regency.
2. Complementary informant: Complementary informant is a person or community that are assumed to understand the research problems, although these individuals or communities are not actively involved in research problems. Thus, the complementary informant in this research are visitor and the community.

3 Literature review

3.1 Stakeholder theory

Stakeholder theory is a theory that explains business ethics and organizational management [16]. Based on the definition of stakeholder theory, the main goal of an organization is to achieve many benefits. These benefits will of course have a positive impact on stakeholders (namely groups and individuals who can influence, for example, civil society, communities, customers, employees, government, shareholders and suppliers) [17]. Stakeholder theory is not just a normative theory that explains business ethics and corporate social responsibility. On the contrary, this theory aims as a basic framework for understanding and managing the interests of various stakeholders which have effects on other areas such as corporate social responsibility, ethics and desire. In this modern era, stakeholders have become an important consideration in the decision-making process with various strategies being developed and implemented to achieve effective engagement between stakeholders [18]. The stakeholder theory can be seen in Fig. 2.

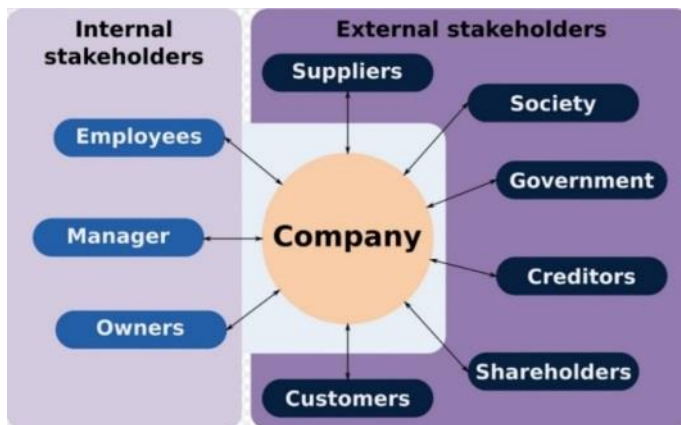


Fig. 2. Stakeholder theory.

3.2 Risk communication

Risk communication is a part of preventing environmental problems which effects the pubic. Risk communication have dynamic and interactive process which involve various field with exchanges principle between communication for every group [19]. Moreover, in performing effective risk communication, it is necessary to follow the context in activities of disaster management based on Permenlhk No. 1 2021 which stated there are 5 steps of disaster management:

- a. Prevention
- b. Mitigation
- c. Preparedness
- d. Emergency response
- e. Recovery

For any work to be viable, some planning is required. To design a risk communication effort, whether a one-time message or different directives for different crowds over a more extended timeframe, characterizing points and objectives is vital, dissect the audience, develop the message, decide the proper strategy, lay out a timetable, and assemble these parts into an arrangement that is far reaching. Having a risk communication plan can assist with centering endeavors to keep everybody in question in surveying, conveying, and overseeing risk informed so they can cooperate collectively [20].

Risk communication requires dynamic commitment from all partners, including government offices, NGOs, people group, and the media. This assists with guaranteeing that all viewpoints are thought of and that the most fitting techniques are created to address disaster risks [21].

4 Findings and discussion

4.1 Communication patterns in preventing forest and land fires in the community of fire concerned communities in Bukit Batu District, Bengkalis Regency

Strong social capital can facilitate communities to become adaptive and resilience society [22]. Anti fire community collaborates and cooperates with different stakeholders in communicating between the government and the community. First, to ensure the forest area reaches 0% fire risk, Anti fire community collaborates with the government to obtain the necessary data to solve this problem. Second, to raise community awareness about the risk of forest fires in this area, Anti fire community collaborates with existing activities in the community, for example, Farmer Groups, and Village Officials to spread better community awareness. Thirdly, Anti fire community also collaborates with Corporate Social Responsibility (CSR) such as Pertamina, police in the surrounding area, and local communities to gain information and expand their actions in fire-prone areas. This implementation has led to Anti fire community in Bukit Batu Village winning the Kalpataru award for their efforts to prevent peat land fires.

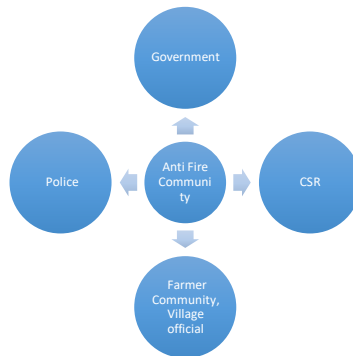


Fig. 3. Communication pattern.

Figure 3 shows coordination and collaboration with community empowerment forces in solving the problem of forest and land fires in Bukit Batu Sub-district, Bengkalis Regency. This was also stated by Mr. Sandi, as the head of the MPA community, where currently there are no more visible hotspots in Bukit Batu sub-district, especially in Suka Jadi village. So the task of the MPA is now more focused on monitoring and continuing to socialize to the community so as not to burn land or be prepared in the event of a land fire. Land fires can also be caused by dry weather factors like today, said Mr. Sandi.

Empowerment term has born since the middle 17th centuries under a definition of invest with authority or to grant authority. Generally, empowerment means to enable or to permit or to leading people to learn to lead themselves. Despite many limitations, there is one mainly focused in individual empowerment, which means a process to increase individual capabilities. The person is empowered when they can lead themselves.

Empowerment also involved cognitive aspects, psychometric, psychology, economy and politic. Furthermore, the knowledge and skill access (internal or external) to maintain environment and natural capital stock continuously. Furthermore, the access for skills training, problem solving techniques, appropriate technologies and information. Moreover, Suharto [23] stated that, empowerment tends to someone's ability to fulfill their basic needs, thus they had freedom, in a matter of freedom of hunger, pain and stupidity, not limited into their freedom of expression.

Communication is a tool that have an important role in optimizing empowerment. Community empowerment activities required to be communicated properly and correctly. In this case, the communication in preventing land and forest fires by Anti fire community in Bukit Batu sub-district, Bengkalis Regency occurs in one and two-way.

The delivery of good and correct information and messages is one of the important factors that determine the success of communication. Based on observations and interviews as well as documentation obtained, there is a line of command from the Anti fire community chairman to members through their WhatsApp group that provides instructions related to activities and necessary instructions of the time and gathering point. Since, forest and land fires are already in the control stage, Anti fire community has expand with other activities such as fish farming which located near the land forest area that must be guarded. Other forms of one-way communication that occur between the community and the village government and security forces are seen during the administration of activities because there is already a hierarchical system in place. Another form of one-way communication between the Anti fire community and the local community can be seen during the socialization of land and forest fires, where the lecture method is chosen in conveying messages to the community. Figure 4 shows one-way communication in delivering messages by the Anti fire community.

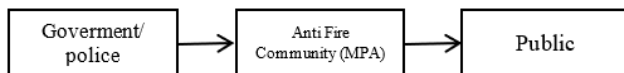


Fig. 4. One-way communication in delivering messages by the Anti fire community.

Two-way communication takes place between the Anti fire community and various stakeholders, both the village government and other partners such as Pertamina Hulu Rokan, officials, and local communities. In coordinating with the community, the Anti fire community joins a WhatsApp group, one of which is a WhatsApp group for farmer groups, This was conveyed by Mr. Sandi as the head of Anti fire community Bukit Batu "In coordinating and communicating with the community, we join various WhatsApp groups, for example the WhatsApp group of farmer groups, this is much more effective because we can convey information about forest and land fires and remind people not to burn forests and land directly to the community in the WhatsApp. Besides that, we can also socialize other programs or activities carried out by Anti fire community at this time such as fish farming because it is also hoped that the involvement of farmer groups in this case can continue to maintain so that there are no more hotspots in the Bukit Batu sub-district."

In addition to WhatsApp groups with farmer groups, or other community groups, Anti fire community also utilizes the communication media WhatsApp group specifically for Anti fire community, this WhatsApp group is used to coordinate, regarding the activities of Anti fire community members, This was explained by Mr. Sandi, the chairman of Anti fire community Bukit Batu "As well as with the security apparatus and the police, there is its own WhatsApp group in which it is also periodically reported on the situation and even includes screenshots of locations that directly have hotspots of information about hotspots and their locations, this is usually done regularly, especially if for example there are forest and land fires or information on fires in other areas, then immediately we also coordinate to provide information about existing hotspots and thank God it is currently zero. Fire in the Bukit Batu sub-district".

Two-way communication is also established between Anti fire community and stakeholders, one of which is Pertamina, this communication takes place such as Pertamina providing training and other assistance. As stated by Mr. Sandi as the chairman of Anti fire community Bukit Batu, "Pertamina provides training to our Anti fire community in the form of k3 training such as work safety and also related training such as how to simulate then how when a fire occurs support from Pertamina is also in the form of equipment given to us and there are also training certificates provided, this is also part of Pertamina's CSR".

The communication pattern in the results of this study describes the wheel pattern, based on Devito's concept where the wheel pattern is communication with two channels centered on one center. In this case, the center of the wheel pattern is each community member involved in communication, members will send and receive messages to the communication center and the communication center will receive and distribute the information it receives to each community or member involved. In this communication process, there is the involvement of other communication actors, namely the government such as village officials, officials, the community, and Pertamina company through its CSR program.

Another pattern found here is the chain pattern, where there is a straight line between the individuals or groups involved in the communication. Here it looks like one-way communication, where one person conveys information to the next. In this case, the village officials give instructions to the fire community and then the fire community gives instructions to the general public, especially in relation to administration.

Each member has an important role in each group that plays a role in forest and land fire disaster management. The government in this case is the village apparatus that forms the fire awareness community administratively. Then the police are also involved in this to help with prevention, where the Anti fire community must convey information to the police if there are

hotspots and periodically conduct coordination meetings or at least once a year to convey what happened. In addition, the police will also actively ask questions related to the condition of the local area whether there are hotspots or not. The community in this case is involved in prevention as a target in the socialization of activities carried out by Anti fire community, besides that the community also provides information to the Anti fire community if there are or see hotspots. The company, in this case Pertamina Hulu Rokan, assists in providing assistance in the form of CSR such as training for the prevention of land and forest fires for the community of people concerned about fire in Bukit Batu sub-district.

4.2 Communication barriers in preventing forest and land fires in the community of fire concerned communities in Bukit Batu District, Bengkalis Regency

In preventing forest and land fires in the fire awareness community in Bukit Batu Subdistrict, Bengkalis Regency, there are several communication barriers, both from the communicator and the communicant, or even barriers that come from the communication media itself.

Socio-anthro psychological barriers include: Sociological barriers are barriers that occur regarding a person's social status and relationships. Anthropological barriers are barriers that occur due to cultural differences when communication occurs. Psychological barriers most often occur in the communication process, communication is difficult to succeed if the communicant is sad, confused, disappointed and other psychological conditions. The socio-anthropological barriers encountered are that some people are less enthusiastic about forest and land fire disaster management, this obstacle is overcome by Pertamina by motivating the community through economic improvement activities, economic improvement activities take different forms in each region, tailored to the demand or needs of the local community.

Effendy explained that semantic barriers occur on the communicator side, namely the use of language by communicators that allows misinterpretation, especially in the use of words that are similar, for example soybeans with donkeys, or words that are the same in pronunciation but have different meanings, for example tofu, can mean knowing or the name of food derived from soybeans. In this case, those who usually provide training and socialization to the community are the partners of the fire care community such as Pertamina. In providing training and socialization, there will usually be one or two words that are not understood by the community, this is one of the communication barriers found in the fire care community. But this is not a significant obstacle, because between members of the fire care community and the partners will communicate with each other to explain what is not understood.

As explained by Mr. Sandi as the head of the Bukit batu sub-district fire awareness community, "As for our understanding of what was conveyed by the partners in the socialization activities, sometimes there are one or two words that are unfamiliar to us, but we can ask and the partners will certainly explain what they mean."

Mechanical barriers are obstacles encountered in the use of communication media, such as damage to the communication media used. One of the communication media used to exchange information by members of the fire awareness community is the WhatsApp group, in using the WhatsApp group as a communication medium, of course there are obstacles faced by community members, these obstacles are usually in the form of signal difficulties. In addition to signals that are sometimes difficult, at the beginning of using the WhatsApp group as a coordination medium, another obstacle faced is that members of the fire awareness community have not fully mastered how to share daily reports with coordinate points.

This mechanical barrier was explained by Mr. Sandi as the head of the Bukit Batu sub-district fire awareness community "for obstacles in using the WhatsApp group, the first is that sometimes the signal is lost so our messages are delayed. In addition, at the beginning of

this WhatsApp group when we had to make daily reports to share the coordinates of the patrol location, we also had difficulty because we were not fully accustomed to it."

Ecological barriers are barriers related to the environment, or barriers caused by environmental factors. In the fire awareness community that is engaged in tackling forest and land fires in Bukit batu sub-district, ecological barriers are certainly one of the obstacles felt by community members. In tackling forest and land fires, community members must certainly reach the hotspots that cause forest and land fires, sometimes these hotspots are difficult to reach because there is no path to the hotspots.

This was explained by Mr. Sandi as the head of the Fire Concerned Community of Bukit Batu sub-district "For now, our activities are more directed towards, not extinguishing fires, because now the cases of forest and land fires are quite minimal. But in the past, when there were still frequent forest and land fires, one of the obstacles was the distance between us and the fire point which was sometimes quite far away, and there was no path to the point."

5 Conclusion

The communication pattern hold a crucial key in for successful community empowerment for MPA in Bukit Batu villages. The communication pattern involve multiple stakeholders in action depends on their responsibilities. Participatory Rural Appraisal (PRA) allows community to actively participate in the research which manifested in determine the decision making – process, planning and so on. By having the communication pattern, it helps the progress to be more effectively since there are clear stakeholder that involved which helps MPA Bukit Batu village to ensure there are 0% of fire risk to winning a Kapaltaru award from the government.

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