FOREST FIRE MANAGEMENT IN THE CORDILLERAS

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Abstract - Around the globe, forest fires have flared up. To address this, public safety agencies are mandated to prevent these incidents and lessen the effects in case it will happen. In the Philippines, one of the agencies tasked to manage forest fires is the Bureau of Fire Protection (BFP). Alarmingly, in the Cordillera region, forest fire has been posing as a rising concern. This study aimed to discuss forest fire management in the Cordillera and identified the challenges faced in its implementation. Qualitative research, mainly narrative design, was used in this study through the conduct of Key Informant Interviews (KII), observations, and documentary analysis. The study's findings revealed that the BFP, in partnership with the community and other agencies, follows the DRRM model to manage forest fires. Therefore, it is recommended that there is a need to build capacities of both BFP and the community in dealing with a forest fire. There must also be a continuous and sustainable information campaign on fire prevention initiatives and activities.

Keywords - Forest Fire Management, Common Causes of Forest Fires, Behavior of Forest Fires, Challenges Encountered

I. INTRODUCTION

Around the globe, forest fires have flared up. In the early months of 2020, more forest fire incidents worldwide than last 2019. These caused dire consequences to health, biodiversity, and the economy (Kimbrough, 2020). In the Philippines, forest fires constitute a severe problem. Due to its mountainous properties, Cordillera Region is affected mainly by these forest fire incidents. In the past years, numerous forest fires have occurred, resulting in damages. Last 2020, the Department of Environment and Natural Resources (DENR) reported that there were twelve (12) significant forest fire incidents recorded in eight (8) of the thirteen (13) municipalities of Benguet. These fires affected a total area of 899.53 hectares and caused an estimated P2. 077 million in damage (PIA Benguet, 2020). Last April 23, 2021, local fire and environment officials are trying to put out an ongoing forest fire that has razed around three hectares of land in Bokod, Benguet.

With these incidents, public safety agencies are mandated to prevent these incidents and lessen the effects in case it will happen. Public safety is an integrated and holistic pursuit of the general welfare to ensure and sustain the quality of life for all Filipinos (PDP 2017-2020 Philippine Development Plan NEDA). In this light, the whole nation's approach in addressing current issues and matters of national interest should be in synchrony with government programs towards realizing its ultimate goal of achieving sustainable development and ensuring public safety. With the proclamation of boosting the Philippine economy after the devastating global effect of the emerging infectious disease like the Covid-19 has caused, taking the big step towards rising through promoting local tourism is one of the foreseen solutions meeting this end.

In the Cordillera Administrative Region (CAR), this is something to look forward to considering that it has a lot to offer with the gift of natural resources that abound in this region. The forest and mountains that invite tourists from various places are promising. Also, in this regard, protecting these from fire dangers could further aggravate the situation and risk people's lives, properties, and environment, and eventually, affect the economy.

The Bureau of Fire Protection has its mandate and role in securing safety in the communities, including forests where alarmingly in the Cordillera, forest fire has been a rising concern. Thus, this study analyzes the issues and problems on the causes of forest fire, actions, responses, and challenges faced by the BFP.

II. DETAILS QUALITATIVE

2.1. Methodology

Qualitative narrative research design was used in this study which sought to analyze the forest fire cases in Cordillera. Further, key informant interviews, documentary analysis, and observation were used in the conduct of the study. In addition, triangulation was also utilized to increase the trustworthiness of the data gathered. To answer the fire management programs and challenges encountered by BFP-CAR personnel in handling forest fires. In choosing the BFP-CAR personnel to be interviewed, purposive sampling was used. The criteria for choosing them were: (a) they must be in the service for at least five (5) years; and (b) they must have at least responded to a forest fire within Cordillera. Moreover, there were twenty-one (21) participants that were interviewed. These participants are assigned in the different provinces of Cordilleras.

Before the conduct of the interview, informed consent was administered to them. The contents of the consent were explained in a language understandable by them. Also, the researcher introduced herself as a

student-researcher with her identification card and a certification that the researcher is currently enrolled in. Then, the results of this study were presented to the participants for validation.

To answer the causes of fire, a documentary analysis was done on the records of forest fire incidents from 2016-2020. BFP-CAR provided these documents. In the study, thematic analysis was used in analyzing the qualitative data. It was applied to a set of texts, such as in the interview transcripts. The researcher closely examined the data to identify common themes – topics, ideas, and patterns of meaning that came up repeatedly.

III. RESULTS AND DISCUSSION

3.1. Common causes of Forest Fires

Based on the findings uncovered, the most common causes of forest fire are due to human beings. These include *kaingin*, human neglect, and carelessness. According to all the key informants, *kaingin* is the most common causes of forest fires. As KI 2 said, "Human activities near or within the forested areas are the common causes of forest fires. Most of it is irresponsible *kaingin* (slash and burn) activities and agricultural land clearing operation." Due to the richness of the soil in Cordillera, farming is considered one of their primary livelihoods. With these, farmers must clear the land and transform it into fertile and cultivable land. This process is known as the *Kaingin* or "Slash and Burn." However, due to its rampant practice, especially in Benguet Province, it led to forest fires. Twelve (12) key informants mentioned that farming practices like *Kaingin* is mostly the reason for the occurrence of forest fires. As KI 20 said, "Majority of people in the Cordilleras live by vegetable farming; they do *kaingin* to prepare the land for planting."

To support this, KI 5 said, "As an arson investigator assigned here at the mountainous and forested part of Cordillera where the livelihood is gardening and growing their vegetables to sell at the market. For the soil to be ready for the next crop, gardeners and farmers should clean and burn the rubbish waste of the last crop." Thus, by doing this, they need to make sure that the grasses or the remnants of the previous crops are dried up. And when left unattended, these may cause a higher magnitude and faster spread of forest fire. Also, these activities usually happen during hot weather. In a news article by Ilao (2020), kaingin is linked to Benguet forest fires. In her interview with Edgardo Flor, he mentioned that kaingin is one reason for the forest fire incidents at the beginning of 2020. Farmers start to clear areas in preparation for planting in March and April.

On the other hand, human neglect also contributed to the recent forest fire incidents. This negligence is attributed chiefly to the careless disposal of lit cigarette butts. This is evident in the responses of eleven (11) key informants. As KI 2 narrated, "Improper discarding of cigarettes into vegetation without completely extinguishing the burning butt." The forest fire that occurred in the foot of Mount Santo Tomas at Tuba, Benguet, last January 2020 is believed to be caused by a cigarette that was discarded while it was still lit caused a fire that razed more than two hectares of forest in Benguet (Garcia, 2020). As also mentioned by KI 5, "The area was used as a hunting place for the community. An unknown passerby threw a lighted cigarette butt into the accumulated dried grasses and twigs, which eventually grew into a big fire.

Likewise, in Bauko, Mountain Province, it was revealed that negligence is the most common cause of forest fires. As KI 22 said, "Negligence, almost all or majority of fire incidents responded by this station was due to unattended burning of dried weeds before the cultivation of the soil for vegetable farming or from rare cases w/c includes improper disposal of cigarette butts."

This is also like the results of the study of Ahmad (2001), wherein in Malaysia, irresponsible cigarette smokers are also a significant concern. People who smoke cigarettes throw the butts without ensuring that they have been properly extinguished. A large portion of fires that originated from the roadsides and then spread inwards to the forest reserves are suspected to be caused by smokers who throw lit cigarettes while traveling along the roads.

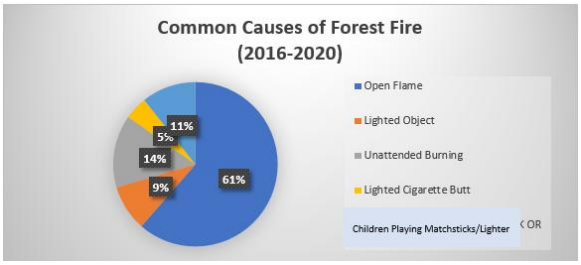


Fig.1. Common Causes of Fire in the Cordilleras

3.2. Determining the Behavior of Forest Fires

In responding to forest fires, fire officers must consider the following for safety and decision-making purposes.

Knowing how a forest fire behaves is critical in managing and responding to forest fires for fire officers. There are many factors to be considered, and it includes how a forest fire burns, how fast it moves, and how difficult it is to control (Idaho fire wise, n.d.). These can be done through keen observation using our primary senses. All the participants mentioned weather, topography, and fuels are the factors that affects the behavior of fire.

The weather condition includes wind direction, humidity, air pressure, and moisture. From the interviews conducted, these were derived about this. Like KI 7 and 13 shared that in order to determine the behavior of forest fire, it is best to consider the weather condition whether dry or hot season, know

the wind direction and assess the thickness of the forest."

Moreover, topography of the area influence the spread of the fire. According to KI 15 and 16, the terrain of the mountain also contributes in the behavior of fire. They mentioned that the slope orientation of the forest is important to determine that usually, fires have a slow movement downslope." KI 19 also observed this in the forest fire last May 2021 at Oyusan, Cattubo, Atok. Accordingly, the landscape of the forest affects the behavior of fire.

3.3. BFP Prevention and Mitigation Response

Prevention and mitigation are crucial in forest fire management. These include series of steps in reducing the risk of the forest fire.

Based on the study's findings, involving the community is one of the prevention and mitigation responses of BFP. KI 2 and 3 shared that in the place where they were assigned, there station has enhanced the implementation of forest fire prevention by increasing motivation through training, seminars, and raising awareness at the barangay level for them to be partners in the care and protection of mother nature.

According to KI 8 and 24 shared that the conduct of intensified education and fire prevention campaign raised awareness among the community members on the heightened risk of forest fires. This is usually done in coordination with other agencies or offices like Department of Environment and Natural Resources. The lectures conducted by BFP include how to respond to a forest fire before the scene, during the scene, and after the scene. Aside from these, they also help the barangay or municipality formulate their Community Fire Protection Plan and assist them in their Disaster Management plan. Together with concerned agencies and LGU, they construct fire breaks.

Strengthening community participation in managing forest fire is very important in addressing the lack of manpower. Thus, BFP also encourages the local community to establish volunteer fire organizations. For example, the Community Fire Auxiliary Group (CFAG) or Barangay Bantay-Sunog is an organization within the barangay that assists the BFP in inspecting and removing fire hazards in the community. In addition, they develop fire prevention programs and plans of action for the company or organization to address possible fire situations in the community (DILG Memorandum Circular 2019-40).

3.4. Recovery

Once the forest fire has already been suppressed, the next part of the BFP activities involves recovery and rehabilitation. The interview conducted most impacts of forest fire include water shortage, destruction of habitat, loss of vegetation, landslide, and trauma to the community. As mentioned by KI 1, "It most commonly affects the water supply of the community due to damaged water irrigation hoses. It has also been observed that due to forest fires, a lot of trees and plants die, causing landslides during the wet season."

Recovering from the impacts of forest fires is essential. Through the BFP, they help in rehabilitating and restoring the damage caused by the forest fire. This includes coordination with other agencies and community outreach and empowerment.

Aside from BFP, there are other agencies in charge of the management of forest fires. These are the Department of Environment and Natural Resources (DENR), Local Government Units (LGU), and Municipal Disaster Risk Reduction Management (MDRRM).

As mentioned by KI 1, "We do again collaborate with the LGU and other government offices to help the community rehabilitate." These LGUs include the following levels: provinces, cities, municipalities, and the village-level barangays. Disaster Risk Reduction Management is vested in all levels.

In the case of Bokod, KI 23 shared, "The BFP personnel is very active in Activities coordinated by the LGU Bokod, BLGU Bokod, and other government agencies Like for example continuous joining of clean up- drive scheduled once a month. BFP personnel also assists in the delivery of relief goods provided by the LGU for its Constituents. The personnel are also observing participation in tree planting."

Also, information dissemination is being done as a part of recovery and rehabilitation. They inform them about what the community will do during the aftermath of the forest fire and further forest fire prevention. As shared by KI 8, "Through intensified education and information campaign on fire prevention, encouraging communities for tree planting and to obey local laws in coordination with DENR and concerned organizations."

In summary, this study reveals that the most common causes of forest fire are attributed to human factors like carelessness and practices. Since most of these are agricultural areas, there is a challenge in stopping these practices because this is considered their livelihood source. Thus, it can be inferred that managing forest fires can be complicated and unpredicted. Moreover, determining fire behavior is one of the tools of the BFP personnel to suppress the forest fire safely and successfully. This is their basis of decision-making during the fire response. In addition, the BFP is also applying the DRRM Model. Based on the study's findings, the community holds an integral role in successfully managing forest fires. Thus, most bureau activities encourage the community to participate and become part of the management. Aside from the community, coordination with the different agencies is significant to address challenges with manpower, logistics, and applying the DRRM model.

IV. CONCLUSION

Based on the findings of the study, Forest fire management in the Cordilleras involves determination of causes of forest fires. It also includes the use of the DRRM model in the prevention and suppression of forest fires.a. The most common causes of forest fires are related to human causes that can be attributed to farming practices (e.g., Kaingin) and human negligence. The fire environment, when properly determined, helps in the decision-making of the firefighters during forest fire management. Collaboration of the BFP with other agencies prevent and mitigate response in the prevention, response, and rehabilitation. Moreover, the community holds an integral role in the prevention and mitigation of forest fires in Cordilleras. Coordination with other agencies during the recovery or rehabilitation after the forest fire helps in enhancing the resilience of the community.

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