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Exploration and Thinking on Related Mechanisms of Forest Fire Prevention

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ABSTRACT
In the face of frequent forest fires and serious casualties, the clarification and implementation of related responsibilities have been the top priority of the prevention and control work. Throughout the accountability process, the author aims to understand the causes and characteristics of Liangshan forest fires, be familiar with the operation of the emergency management system, find related problems that need to be solved urgently, and finally put forward more feasible regulatory suggestions. While collecting information and understanding the status quo, it also necessary to consider the possibility and necessity of accelerating emergency management-related regulatory measures and law enforcement, and actively engage with professional-related theoretical knowledge for critical thinking.

Keywords: *Forest fire status, Emergency management system construction, Forest fire management capability, Regulation and suggestions.*

1. INTRODUCTION

On March 30, 2019, a forest fire broke out in Li'er Village, Yalongjiang Town, Muli County, Liangshan Prefecture, Sichuan Province. The fire point was in high altitude, rugged terrain, variable climate, inconvenient transportation, and backward communication and rescue infrastructure. The forest fire caused 31 casualties. On April 5, the Emergency Management Bureau found out the cause of the fire and confirmed it was a lightning fire. The burning area of the fire was about 19 hectares. On April 7, the same fire spot in Muli, Liangshan re-ignited, and forest fires also broke out in other districts and counties at the same time.

On March 30, 2020, a forest fire broke out on a ridge in Jingjiu Township, Xichang, Sichuan. During the rescue, 19 people died and 3 others were injured due to a sudden change in wind direction at the fire site. The forest fire caused a total damage of about 3,050 hectares, causing huge economic losses. In order to find out the cause of the fire, learn from experience and lessons, formulate practical emergency plans, and take corresponding measures to effectively prevent similar incidents from recurring, the Sichuan Provincial Party Committee and the Provincial Government decided to establish a special investigation team for fire incidents. After a comprehensive investigation, the direct cause of the "3.30" forest fire in Xichang, Liangshan was: the transformer was affected by the wind and wind direction and contacted with the telegraph pole to cause a malfunction. During the burning process, the fired object unfortunately fell on the grass, causing a spreading fire. The cause of the fire was non-man-made fire caused by the changing wind direction and strong wind. During the investigation by the task force, real problems were discovered, such as backward concepts in fire fighting and unmatched infrastructure. At the same time, the investigation team found the source of the unclear division of responsibilities of relevant functional departments and the inadequate implementation of responsibilities. The team was also aware of practical problems such as the lack of pertinence of the emergency response plan and the low efficiency of the emergency management system.

Regarding the accountability of forest fires in Liangshan, five specific general directions need to be perfected, including "causes and characteristics of forest fires", "population rate of disaster prevention knowledge", "operations of emergency management system", "relevant emergency plans for specific objects research", "emergency plans".

First, it is necessary to study and sort out the current situation of the emergency management system within China in the Sichuan-Chongqing region, mainly including the views of various subjects (governments, relevant agencies, and the masses) on the definition of "emergency plan", and investigate and study the current management problems, relevant laws and regulations on emergency management, the implementation of specific laws and regulations online and offline, etc. in the Sichuan-Chongqing region emergency management system. In addition, while collecting information and understanding the status quo, it is also necessary to think about the possibility and necessity of accelerating the legislative process related to emergency management, the pace of law enforcement, find certain solutions and plans, and actively contact professional-related theoretical knowledge for critical thinking.

2. OVERVIEW OF FOREST FIRES

2.1 The Current Situation of Forest Fire Management in Liangshan

Taking Liangshan Prefecture as a case study of the pre-plan research work location, from the local official website of the Liangshan Prefectural People's Government, the author found the comparison of the pre-plans of the "Liangshan Prefectural People's Government Office on Printing and Distributing the Emergency Plan for the Handling of Forest Fires in Liangshan Prefecture" in 2013. It is found that the local emergency rescue plan in Liangshan Prefecture is integrated and meets the special local hazards. There are fewer emergency rescue methods and more general prevention and control methods. At the same time, the risk reward and punishment management mechanism for local related staff is not perfect. However, because each region has different geographical features, such as topography, landform, vegetation, climate, etc., and the human characteristics are very different, and Liangshan Prefecture should be based on special ethnic minority humanities and customs, the forest fire emergency response mechanism in each region should be different, and there should be targeted emergency plans and rescue measures. Judging from the actual situation of the "3.30" fire in Liangshan Prefecture in 2019 and the "3.30" fire in 2020, not only the casualties were large, but also some problems in the fire emergency plan were exposed. Therefore, in order to prevent forest fires, it is a must to start from the management and system level.

2.2 Causes of Forest Fires in Liangshan

In Liangshan Prefecture, the total fire area and total number of fires in the city over the years have shown a continuous downward trend with the development and changes over time. There are three main reasons: The first is that China has issued corresponding and corresponding fire protection laws, so that the disaster behavior of burning fields and burning wasteland in the disaster area has been effectively controlled, thereby greatly reducing the possibility of man-made fires; the second is that as China's investment in fire prevention and disaster relief continues to increase, a large amount of social manpower, material and financial resources in the disaster area can be used to actively do a good job in firefighting and disaster relief work in the disaster area; the third is that the average precipitation in the area has only increased slightly. However, researches from various data have found that the cause of the frequent fires in Liangshan Prefecture is closely related to the climate and the causes of man-made fires.[1]

2.2.1 Causes of Fire and Climate

Liangshan Prefecture is located in the alpine valley region of western Sichuan, with high mountains and deep valleys, and its climate characteristics are more prominent. It has four distinct seasons of dry and wet, large temperature difference between day and night, and significant "foehn effect". Therefore, this monsoon area is prone to local forest fires that are difficult to fight. According to the survey, the weather, dry humidity and other factors in the area will have a greater impact on the occurrence of fires, but the occurrence of fires is generally considered to be the inevitable result of the mutual interaction of multiple predictive factors. In recent years, these meteorological predictors have been unable to become the inevitable cause of fires, mainly because the state has invested a large amount of financial funds in fire prevention and disaster reduction work. At the same time, the accurate weather forecasts of China's meteorological department have also made a huge contribution to the prevention and control of fires, which has made the frequency of fires have been effectively controlled and alleviated to a certain extent.

2.2.2 Man-made Causes of Forest Fires

One of the main reasons for the frequent occurrence of forest fires in this area may be mainly because Liangshan Prefecture is a local settlement of the Yi nationality, and various ethnic groups live in it. Because the villagers go to tombs to burn paper and hold sacrificial activities around the Qingming Festival in April each year due to the traditional folk customs of the Yi nationality, man-made fires might be triggered. Because fire is the totem of the Yi people, they are inextricably linked to fire, and their folk use fire activities are extremely frequent. At the same time, there is a habit of burning fields in rural areas. These factors are the reasons for the frequent occurrence of forest fires.

3. FOREST FIRE PREVENTION AND CONTROL MEASURES

3.1 Improving Management Capabilities Is the Primary Measure

3.1.1 Before a Disaster Occurs, It Is Necessary to Increase the Popularity of Fire Prevention Knowledge Among Local Residents, and to Establish an Early Warning Mechanism with High Technology as the Main Driving Force

On the one hand, taking into account the special situation of ethnic minorities living in Liangshan Prefecture, In the pre-prevention propaganda of the forest emergency management system, for ethnic groups with a relatively large population, such as the Yi, Tibetan, and Hui, it is a must to investigate and study their beliefs in "forest" and "fire", formulate targeted propaganda methods to improve fire prevention efficiency of propaganda to reach the effect of universal participation.[2]

According to the survey, more than half of the population has almost no knowledge of forest fire prevention, and only 10.85% of the population do. There are two reasons for this phenomenon. Firstly, the publicity of forest fire prevention is not in place. Through the visits and investigations of various communities, it is not difficult to find that there are major problems in the promotion of forest fire prevention knowledge in different regions. Whether it is a high-incidence area of forest fire disasters or other low-incidence areas of forest fire disasters, effective publicity of forest fire prevention knowledge is still insufficient. The villages and communities currently carry out more fire protection education and publicity, but the content of targeted fire protection education and publicity is insufficient, and lacks fire protection pertinence, warning and fire education. And it is precisely because the fire safety propaganda of the whole area is not in place, to a certain extent, it directly leads to the weak awareness of fire safety among the people. Secondly, these practical problems are attributed to the outdated local concept of fire prevention. Because the forest fire prevention concepts of the local forestry bureau, forest fire protection and other related departments are relatively backward, the related irresponsible personnel in the community are not in place with regard to forest fire prevention awareness and the local people's concept of fire prevention is backward.

In order to promote the in-depth understanding of local rural residents' knowledge of community fire prevention, functional departments should stipulate that various activities should be actively carried out, such as: carrying out relevant community fire prevention knowledge publicity and education, holding fire prevention knowledge lectures, posting publicity posters in the bulletin boards of relevant organizations, and setting up a reporting phone. At the same time, a wide audience need to be promoted through various media such as online newspapers, television, radio stations, mobile phone text messages, and the Internet.

On the other hand, in recent years of technology updates, new technologies that can be used in forest fire emergency warnings have not been used, such as 5G technology, Internet of Things technology, the latest drone technology, etc. Not only for Liangshan Prefecture, the use of technical means should also be considered in forest fire emergency all over the world.

Applying high technology to forest fire prevention can better improve the management and control of forest fires by functional departments. For example, GPS and GIS are used to monitor the status quo of the forest area and formulate a series of scientific and effective emergency plans; at the same time, on the basis of the network data system, it can also form an early warning network with surrounding towns, villages and other organizations, and strengthen forest fire early warning and response capabilities through an integrated patrol system.[3]

3.1.2 In the Event of a Disaster, There Is a Necessity to Improve the Comprehensive Coordination Capabilities of Functional Departments and to Improve a Unified Emergency Support System

It is a must to build a timely and effective information system first. Functional departments should announce relevant emergency plans to the society as soon as possible, and report the relevant situation of the disaster site in a timely manner; as a communication link between the public and the disaster area, it is necessary to coordinate the forces of all classes of society, and let well-trained personnel participate in the rescue work. . Then, it is also necessary to improve the responsibility accountability system, so that all organizations can "do their own duties and bear their own responsibilities", formulate feasible emergency plans, and enable the effective operation of the emergency management system.

Finally, it will be very important to improve the unified emergency support system and act as a support force on the road to disaster relief. Not only must the materials and communications be guaranteed, but also the disaster relief team and life safety must be guaranteed. At the same time, the corresponding authorities should establish a risk-sharing mechanism, cooperate with relevant social organizations, and strengthen the market's risk-taking. [4]

3.1.3 After the Disaster Occurs, All People Involved Need to Do a Good Job of Comprehensive Assessment and Reconstruction

The related departments should further analyze the impact of forest fires and natural climate disasters on the regional ecology, and conduct monitoring and evaluation after the disaster. Forest fires will cause the destruction of forest resources and at the same time bring adverse effects on the social economy. Therefore, it is not only necessary to investigate forest fire related situations, but also to carry out a comprehensive assessment and monitoring of their impact on society and economy more actively to prevent secondary disasters and provide scientific theoretical support for forest reconstruction, as well as provide theoretical support for reconstruction work.

In order to promote the development of reconstruction work, it is a must to first hire professionals to provide professional guidance and technical analysis on the improvement of the ecological environment and the restoration of vegetation in the disaster-affected area, and provide technical support for the reconstruction work; secondly, there will be a need to call on the whole people to participate in planting activities and do our part to restore the damaged vegetation. After experiencing forest fires in Liangshan Prefecture, relevant departments organized a voluntary public welfare activity called "I Plant Trees for Lushan" to allow the whole people to participate in the reconstruction.

3.2 Implementing Forest Fire Protection Responsibilities Is an Effective Measure

3.2.1 Recommendations for the Regulation of Forest Fires

There is a necessity to improve the incentive system for related staff, improve the treatment of mountain patrol and forest protection personnel and rescuers in the area, and provide them with a better working environment. Because the relevant incentive mechanism in the area is not sound, coupled with the current steep terrain, backward transportation information and other practical reasons, it has increased the difficulty and risk of its rescue, and greatly reduced the enthusiasm of its rescue staff. In addition, most of the area is state-owned forest land, and some farmers who generally lack a sense of collective social responsibility are unwilling to actively participate in forest fire fighting activities. This has caused a shortage of professional and technical personnel for firefighting, which has greatly delayed the time for firefighting. As a result, large-scale forest fires continue to occur and spread, and large areas of forest are also destroyed.[5]

It is also necessary to promote the legalization of forest fire prevention in this area. First, it is a must to take the "Emergency Response Law" and the "Disaster Relief Law" as the core of the legal system, combined with other relevant rules and regulations, to establish a sound legal and policy system for forest fire prevention; secondly, there is a need to build a unified accountability mechanism. The promulgation of relevant rules and regulations can implement the accountability mechanism that is responsible for all levels of government

departments and other relevant functional departments, clarify the laws and consequences of fire prevention workers' negligence accidents by governments at all levels, and stipulate the scope of application and procedures for investigating responsibility for forest fire accidents.

It will be of great significance to clarify the functions of each department and implement specific responsibilities. In the construction of forest fire prevention measures, the implementation of fire prevention responsibilities is not in place and the basic facilities are not complete. Party committees and leading cadres in some regions generally lack the ideological awareness of forest fire emergency response that focuses on prevention, the responsibility is not fulfilled in place, and power and responsibility is imbalanced and unclear. When a forest fire occurs, and full-time personnel need be used to put out the fire, it often delays the effective time for emergency firefighting. At the same time, some grassroots leadership cadres do not attach great importance to the explosiveness of forest fires. Although they occasionally went to their grassroots to carry out inspection and supervision of forest fire prevention construction work, they did not put all the responsibilities in place. [6]The forest fire prevention work has implemented a responsibility system with the chief as the core, allowing people to clarify the main body of responsibility. However, in actual work, the forestry authorities are required to do their best to perform specific matters. In this way, many departments and many people think that doing a good job of forest fire prevention is itself a matter of the forestry department. If the arranged matters are not cared about, implemented, implemented, or strictly enforced, the enforcement of forest fire prevention will gradually decrease.

3.2.2 Establishing an Efficient and Feasible Emergency Management System

The emergency management system includes related systems and measures in the early, mid and late stages of the fire. The early stage includes the early warning mechanism and the propaganda mechanism, the middle stage includes the management mechanism and the rescue mechanism, and the later stage includes the evaluation mechanism, compensation mechanism and post-disaster reconstruction mechanism.

A mature and complete emergency management system will further clarify the division of labor among various functional departments, bring more scientific and effective response plans for disaster rescue, and make rescue efficiency more efficient. The improvement of the emergency management mechanism is also conducive to the timely evacuation of personnel in the disaster area, reducing casualties. And secondly, an efficient rescue plan can reduce the loss of property in the disaster area to a greater extent.

4. CONCLUSION

Liangshan Prefecture has abundant forest resources, and its vegetation coverage is among the highest in the province. The importance and urgency of forest fire prevention are self-evident. Adhering to sustainable development and changing the traditional concept of fire prevention are the new concepts of forest fire prevention; improving management capabilities and speeding up the legislative process are new methods of forest fire prevention. In order to vigorously promote the construction of a green and ecological social civilization system in the whole region, it is necessary to promote the peaceful coexistence of the economy, society and nature in the whole region, implement various forest safety and fire prevention management measures, and prevent problems before they burn.

AUTHORS' CONTRIBUTIONS

This paper is independently completed by Helin Feng.

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