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Study on the Causes of Rural Lightning Disaster and Countermeasures of Lightning Protection and Disaster Reduction

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ABSTRACT

With the development of the time and the progress of economy, great changes have taken place in the environment. In recent years, it is common to see bad weather, such as hurricane, drought, lightning and so on. The emergence of these weather has the greatest impact on farmers and crops, especially the lightning weather, not only that, but also sometimes cause personal injury. In face of the frequent occurrence of bad weather in recent years and its harm and threat to China's agriculture, rural areas, personnel, etc., the author makes a detailed study on the causes of rural lightning weather, analyzes the lightning protection measures in rural areas and their shortcomings, and summarizes the relevant improvement measures.

1. Introduction

In recent years, there are many events caused by lightning disasters, especially in rural areas. Taking Jiangxi Province as an example, Jiangxi Province is a thunderstorm prone area. According to the statistics of Jiangxi Meteorological Department, there were 5093 lightning disasters in Jiangxi Province from 2004 to 2012, and 463 people died of lightning disasters. Among them, in 2006 and 2007, the number of lightning casualties ranked first in China for two consecutive years. The statistics of lightning casualties in the past 10 years show that the average annual number of casualties is about 850, and the number of deaths is about 450, while the rural area accounts for 92.3% of the total number of casualties. According to the statistics of Guangxi typical examples of lightning disasters, 2006-2009 Among the lightning disasters occurred in

Guangxi in, 93.2% of the deaths occurred in rural areas, 92.8% of the deaths occurred in rural areas, 91.6% of the injuries occurred in rural areas, 52.4% of the damaged houses occurred in rural areas, and 38.6% of the direct economic losses occurred in rural areas. For example, at 17:00-18:00 on August 28, 2006, a bungalow without lightning protection device on the mountain floor near majiong village, Dadong Town, Qinzhou City, Guangxi was struck by lightning, causing two people to die on the spot and five people to be injured; on May 25, 2007, Xingye Village Primary School in Yihe Town, Kaixian County, Chongqing was hit by lightning, causing seven primary school students to die and 44 students to be injured, among them five people to be seriously injured; on June 25, 2007, the lightning struck the bungalow near majiong village, Dadong Town, Qinzhou City, Guangxi Province, Five people were killed and one injured when a lightning

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strike struck a hillside Pavilion in Xiaolongping, Zhiwan village, Panshi Town, Yueqing City, Jiangsu Province.

Lightning protection awareness or lightning protection measures are not in place. After the investigation, the author found that lightning disasters will also cause great losses to the economy. In rural areas, farmers “depend on mountains and rivers”, and the quality of crops is up to fate. So far, once natural disasters occur, they will inevitably cause a lot of losses to crops and directly affect the farmers’ economic income. Therefore, in order to recover more losses and save more people’s lives, starting from the lightning protection measures in rural areas, according to the current causes of lightning disasters, the existing rural lightning protection measures are analyzed and innovated, so as to protect the interests of society, economy and people.

2. Analysis of Lightning Protection Development in Rural Areas

Since the beginning of this century, many lightning disasters have occurred frequently, especially in rural areas. The author studies the loss caused by the disaster, combined with the national statistical data and local typical lightning disaster cases, and finds that the proportion of lightning disaster in rural areas from 2006 to 2009 is as high as 93.3%, of which 91.2% caused personal injury; in terms of economic loss, lightning disaster caused direct economic and housing losses, according to the relevant investigation and combined with the basis 56.3% of the losses came from housing and 37.6% from direct economic losses^[1].

At present, there are many typical cases of lightning disaster in China. The most typical one is a lightning disaster in 2006. A house in a village in Guangxi was struck by lightning due to the lack of lightning protection device, resulting in many deaths and injuries. In 2007, several primary school students in a village in Chongqing were struck by lightning, resulting in 7 deaths and many injuries. In the same year, Jiangsu Province was hit by lightning. A hillside pavilion was struck by lightning, resulting in many deaths and injuries.

At present, many parts of our country, especially rural areas, villages and other areas are suffering from lightning disaster.

3. Study on the Main Causes of Lightning Disaster

Similar events occur in China and other countries. It can be seen how terrible and harmful lightning disasters are. According to the lightning disaster events in recent

years, the author will further analyze why the natural disasters occur and why the natural disasters appear more frequently in rural areas. On the one hand It is to clarify the main causes of its frequent occurrence, on the other hand, to provide some improvement and innovation basis for lightning protection measures. The following is the summary of the main causes of lightning disaster in rural areas of China, as follows.

3.1 Cultural Literacy of Rural Population is Low, the Awareness of Lightning Protection is Weak, and the Understanding of Lightning Disaster is Lack

Our country started as a farmer, because the level of cultural knowledge of farmers is generally low, the reserve of scientific knowledge is relatively lack. Lightning protection awareness is relatively weak, lack of self-protection awareness. The implementation of lightning protection and disaster reduction work of relevant departments is not in place. The economic level of rural areas is low, and the construction of relevant lightning protection facilities is insufficient. Compared with the design, installation and acceptance of lightning protection devices of buildings in cities, there is a big gap. In rural areas, due to the wide area, scattered buildings and backward economy, the management of lightning protection and disaster reduction needs to be improved.

The root of Chinese people is farmers, but with the continuous progress of China’s economy and politics, more and more rural areas are moving towards urbanization. From the end of last century to now, the pace of China’s urbanization process is still accelerating, people’s living standards, teaching and education, quality and literacy are constantly changing and improving, but there are still many villages, prefectural and county-level cities in China. At the same time, these places are also relatively backward. Just because of this, the generation has little understanding of lightning disaster and relatively weak ideology to avoid it. The education passed from generation to generation leads to the insufficient understanding of most people in rural areas, which is one of the main reasons for frequent lightning disasters in rural areas^[2]. Most people in rural areas also attach great importance to natural disasters, but they don’t know enough about lightning. On the other hand, it comes from the foolish idea that the thunder is God’s anger because they “deal with” with farming all the year round, and this kind of lightning can’t be prevented. As time goes on, their attention has been weakened, and no matter houses or other buildings or commanding heights are lacking Lightning protection equipment and measures^[3].

3.2 Village Level, County Level and Other Government Agencies do not Pay Enough Attention to the Lightning Protection Measures and Management

In the past 13 years, China has put forward relevant laws on the prevention of lightning disasters and the reduction of lightning disasters. On the one hand, it is caused by the low cultural literacy and lightning protection awareness of rural personnel, and the poor understanding ability and awareness; on the other hand, it is caused by the general environment. The author thinks that the general environment is the inaction of government agencies. It has been nearly ten years since the relevant laws were put forward in 13.^[4] However, the author's recent investigation of lightning disasters in some rural areas has found that many villagers and village level administrative units are still confused about the law. The main reason is that the superior government's implementation of the regulations and laws is not in place, and the government is hindered by the lack of funds, lack of professionals, and lack of housing Bureau confusion and other reasons did not truthfully convey the legal content of the document to every person, and did not prepare the lightning protection equipment and lightning protection conditions required by the law in place.

3.3 Lack of Resources in Rural Areas Leads to the Lack of Corresponding Lightning Protection Equipment and the Equipment Progress is not Timely

The reason of frequent lightning disasters in rural areas of China is that the relevant equipment is not perfect or too backward, so the author will discuss the problems of lightning protection equipment in rural areas from two aspects.

3.3.1 Use and Installation of Lightning Protection Equipment are Backward

Limited by the natural environment and geographical conditions in rural areas, most of the power, broadcasting, cable, network lines and other lines in rural areas are overhead layout, lack of unified layout planning, and most of them are not equipped with lightning protection devices, and most of them are not connected to the ground wire. The transformer, household electricity meter, telephone, computer and cable TV system of farmers are damaged by lightning from time to time, and even lead to fire. In addition, due to the undeveloped cable TV network in rural areas, most areas use the way of antenna erection to watch TV. Generally, the antenna should be raised more than ten

meters above the roof, especially in some mountainous areas, which are prone to lightning.

3.3.2 Equipment cannot be Updated and Maintained in Time Due to Economic Backwardness

With the rapid development of China's economy, science and technology, the lightning protection equipment has also been improved. However, due to the relatively backward economy in rural areas, the relevant lightning protection equipment is not updated in time, which makes the old equipment gradually aging with the growth of service life. Therefore, the lightning protection effect will be greatly reduced, and with the increase of the number of household electrical appliances, it will be more effective. The lightning protection equipment needs to be replaced to drain; on the other hand, the maintenance of relevant lightning protection equipment is not in place. Although villagers in rural areas have certain lightning protection awareness and have installed relevant lightning protection equipment, the later management and maintenance of the equipment is not enough. Because they have not done more maintenance and inspection all the year round, it will also increase the frequency of lightning shock and accident rate.

3.4 Signal Equipment in Rural Areas is not Perfect, and it is Difficult to Send out Lightning Signal Early Warning Smoothly

Rural areas are relatively backward and need to be improved. It is unrealistic to only rely on Lightning equipment to prevent accidents. Some of the reasons are due to people's ignorance. China's Meteorological Bureau will send weather warnings to people according to the big data situation. However, many rural areas in China are affected by weak signal or far away from the signal source. People in the region can not receive timely warning about the arrival of lightning to remind people to take timely lightning protection measures. Therefore, signal is also one of the main causes of lightning disaster.

4. Research on the Deficiency of Lightning Protection Measures in Rural Areas

According to the above analysis of the main causes of lightning disasters, some corresponding deficiencies in the lightning protection measures in rural areas can be drawn, such as the installation of lightning protection measures of the wrong process, the use of lightning protection equipment process is irregular and so on. We need to pay attention to those in the lightning protection process. The author thinks that in addition to lightning protection

equipment and force majeure itself, there are still some deficiencies such as less lightning protection sites, buildings and other reasons.

5. Effective Preventive Measures to Solve Lightning Disaster

Since the lightning protection measures themselves and the main causes of frequent lightning disasters in rural areas of China have been analyzed, then we will take this as the basis for the improvement and innovation of relevant measures, as follows.

5.1 Improve Farmers' Lightning Awareness, Lightning Awareness and Personnel Quality

In order to comprehensively enhance the importance of lightning disasters in rural areas, we should start from the main aspects. The lack of personnel literacy, lightning awareness and lightning awareness is the reason for frequent lightning disasters. In order to improve this wrong idea in time, the village head should take the village as the unit to conduct a general survey of the relevant knowledge of the villagers in the village, and can also apply for outstanding talents^[7] from the superior unit. In addition, strict self-discipline is the premise to improve the ideological awareness. The head of the village should take the lead in thinking and help people improve their own quality while sublimate their spiritual realm and ideological awareness. There is a saying in China that "everything should be done from the baby", which also proves that we should pay attention to this ideological awareness. Children, let children set up correct lightning protection consciousness and take correct lightning protection measures in time^[5].

5.2 Strengthen the Supervision of the Government's Implementation and the Publicity of Lightning Protection Knowledge and Measures

Governments at all levels need to build a sound lightning protection and disaster reduction emergency plan system to further enhance the prevention capacity. It is necessary to strengthen the propaganda so that the farmers can master the general knowledge of lightning protection, "lightning belongs to the phenomenon of natural discharge". The local meteorological department needs to instill more relevant ideas into the farmers and get rid of the feudal superstition as soon as possible. We should take all kinds of lightning accidents as cases to analyze and fully understand their harmfulness. We should make use of publicity to let them learn to take reasonable measures to prevent and reduce lightning disasters and eliminate them from the source. Then the administrative units and

governments at or above the county level should put it in place, every village official and every farmer^[6].

5.3 Implement Responsibilities and Carry out Equipment Maintenance and Inspection Regularly

The responsibility of governments at all levels is to pass on the instructions of the central government at all levels. Government personnel at or above the county level should speak well and clearly about the relevant laws and regulations. The relevant departments should perform their duties, start the emergency plan measures in the shortest time, and report the disaster situation to the relevant government agencies as soon as possible. Carry out investigation and identification of disasters jointly with meteorological agencies. We must resolutely avoid the phenomenon of concealing the disaster situation. For those behaviors that cause lightning disasters due to violation of laws or cause serious losses due to unreasonable emergency plans in case of disasters, the relevant competent departments must take serious actions and investigate the responsibility in accordance with the relevant laws. At the same time, we should also do a good job in the secondary accidents caused by lightning disasters. In addition, it is also the responsibility of the government to purchase new equipment for rural areas, teach installation methods, and arrange professionals to maintain and inspect lightning protection equipment on a regular basis. During the inspection and maintenance period from May to October, the inspection frequency should be increased. On the one hand, lightning weather is frequent in this period. Secondly, the frequency and power of people using electrical appliances are higher in this period, so it is necessary to increase the inspection frequency in this period. Increasing the inspection frequency is also one of the optimization measures for lightning protection and disaster reduction^[8].

6. Conclusions

The causes of frequent lightning disasters in rural areas include human factors and natural factors. Therefore, this paper makes a detailed analysis of the causes and summarizes the corresponding solutions. In order to continuously improve the awareness of lightning and increase the awareness of lightning protection in rural areas, it is necessary to protect the life safety of people in rural areas and reduce the economic losses caused by disasters. The author thinks that although the research is carried out in rural areas, the conclusion is not only applicable to one place, but also can be used in urban areas, and the lightning protection measures can be further improved.

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