Research Progress of the Impact of Climate Change on Flood Disasters

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Abstract: Since the 21st century, the change of global climate has been relatively large. At the same time, it has caused more and more natural disasters, which has not only posed a serious threat to people's property and life security, but also produced a greater impact on the comprehensive development of the country. Among many disasters, flood disasters have the most frequent occurrence and have brought serious losses to people. This issue has attracted the attention of relevant scholars at home and abroad, while the relevant government and departments also offer strong support for the in-depth study. In this paper, some impacts of climate change on flood disasters are briefly described and the processes are briefly analyzed.

1. Reasons for the Formation of Flood Disasters

At present, the issue of climate change has attracted worldwide attention, and relevant scholars have formulated relevant research programs, focusing on the impact of flood disasters. In recent years, the Climate Change Committee has issued relevant management reports on climate change. According to the research, it has been found that climate change is the main cause of flood disasters.

According to the statistics of relevant experts, the regions with large climate change are very prone to suffer flood disasters, which not only requires more prevention work in the region, but also makes it relatively more difficult to achieve complete prevention. Since the 21st century, the global temperature has shown an upward trend. In recent years, the number of waterlogging and flood events in China has been increasing, destroying countless families and causing tremendous economic losses. Relevant committees also attach great importance to this issue, and require the whole country to do a good job in flood risk management. When assessing the risk, people are asked to pay attention to climate change and observe how climate change can affect flood disasters.

In the process of research, it is essential to clearly find out the specific impact of flood disasters on climate change. At the same time, it is necessary to predict the relevant weather. Through advanced science and technology, the specific situation of flood disasters can be known. The analysis of many aspects of climate is conducive to reducing the impact of flood disasters and thus ensuring the comprehensive development of society.

At present, flood disasters are relatively complex and involve a relatively large number of contents, which usually cause different impacts according to the topography and soil quality. Moreover, some projects have certain impact, such as water conservancy projects, which will lead to flexible climate change in the construction process. In this way, it is hard to obtain specific information about flood disasters, thus failing to effectively do a good job of prevention. At present, there are too many conclusions about the impact of climate on natural resources, and the relevant researches are not specific and clear enough, which makes it difficult to carry out flood control work.

2. Relationship between Climate Change and Flood Disaster System

The Climate Change Commission will change the average and change characteristics of the fourth climate report, including some human-induced impacts in the climate system. In this system, it can be found that precipitation and temperature changes are the most important factors causing floods. Studies show that floods, a natural disaster, can be combined with many aspects of nature,

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and are defined as currents overflow from the normal range of a river or other body of water through reports, which usually do not cause floods. River floods have attracted much attention both at home and abroad, and has been studied in depth.

There are great differences between river floods and natural floods. Natural floods, which are caused by various factors and natural environment, have a greater impact on the development of society and are not conducive to the future development of the country. Extreme rainstorm weather has a great impact on river runoff. The vegetation and soil around the river will be used by floods to constitute the environment of flood disasters. Under the constant change of global climate, climate change produces a great influence on the change of water temperature, which will destroy the natural environment of other areas and lead to different disaster factors. On the whole, the formation of flood disasters is mainly due to weather, combined with human factors and the impact of development on the environment, which affects the change of river runoff, and then may cause floods.

According to relevant experts, climate change has two kinds of effects on flood disasters, one is the direct impact, the other is the indirect impact. Each type causes varying degrees of change. First of all, the direct change of climate system forms a unique system of atmospheric circulation, which changes the global precipitation on a large scale and has a great impact on the precipitation pattern. It brings sudden extreme rainfall to some areas. In addition, from the distribution module, there are great changes in the atmosphere, water vapor pressures and temperatures in the thermodynamic region. At present, under the condition of constant humidity, the global temperature is rising, the evaporation rate is fast, and the water content in the atmosphere is ascending all the year round. These show that in the case of high water content in the atmosphere, there will certainly be a lot of rainfall, and the intensity will be quite high. Moreover, the rise of global temperature has led to changes in drawings in some areas. Soil structure has been destroyed. Desertification and a large number of soil erosion will appear over time, which also means that floods occur more and more frequently. Table 1 shows the impact of climate change on flood disasters.

Table 1 Impact of Climate Change on Floods

Climate Change		
Direct Impact		Indirect Impact
Precipitation Change	Temperature Change	Temperature and Precipitation Change
----------	Evapotranspiration Change	Distribution Change of Soil Surface Vegetation
----------	Change of Water Vapor Content	Change in Soil Properties and Structures
Extreme Precipitation Change	Extreme Runoff Change	Change of Disaster Loss
Rain Condition (Weather)	Water Regime (Land Surface)	Disaster Condition (Social System)
Disaster Factor	Disaster Inducing Environment	Disaster-bearing Bodies
Flood Disaster System		

3. Precipitation Change Caused by Climate Change

Precipitation indicators are usually defined according to different regions and different topographic characteristics. Some special natural factors will have a greater impact on precipitation. In the process of adopting indicators, the maximum value should be taken. In some absolute indicators of specific value, the corresponding deviation of the percentage of regional indicators should be calculated. Usually, the order of extreme precipitation can be analyzed by observational data, and then studied. The model validity is suggested to be used to analyze the related indicators in detail, and to simulate the atmospheric circulation situation. At the same time, the part of the rain

situation can be simulated, and then the future rainfall situation will be predicted. In the process of using it, it is essential to make adjustment according to the actual situation, and integrate it with some previous information.

After some experts invested in their research, many resource data have been used to carry out research and analysis, and the trend has been analyzed step by step by using the parameter Kendall method. The results show that the global extreme precipitation is increasing and occurs more frequently. At the same time, there is a lack of precipitation space. Models in tropical and subtropical regions are relatively difficult to establish. There are serious problems existing in their scales and no reliable data have been analyzed. Relevant experts make use of regional climate to estimate future weather changes in major regions. The results indicate that there will be large extreme precipitation in central and Northern Europe.

Extreme precipitation changes in China have also attracted the attention of many scholars at home and abroad, and have been extensively studied. The conclusions are basically the same. In the past, there was no obvious change trend in precipitation in China around 1950. Although there was no change, the annual trend was upward. Extreme precipitation and high intensity precipitation were distributed in some special areas. There are relatively few days of extreme precipitation in northeast China. Around 1980, there was a sudden change of warm and humid climate in the northwest China, and the trend of extreme precipitation appeared. Meanwhile, it also had a great impact on North China and other regions, and there was gradually the trend of extreme precipitation. The daily Table of extreme precipitation in southwest China is still declining. The water in southeast coastal areas and the middle and lower reaches of the Yangtze River is increasing. The days and intensity of extreme precipitation are also increasing. The most obvious change is in the middle reaches of the Yangtze River, with the trend of extreme precipitation rising in a straight line.

4. Strengthen the Basic Research of the Impact of Climate Change on Hydrological Events

4.1 Study on the Steady Sequences of Water Temperature

Now it has been clearly understood that climate change has a greater impact on the hydrological environment. Moreover, water resources itself are coupled with a strong complexity and suddenness characteristics. The spatial distribution can be analyzed from the water temperature series such as the existing and observed precipitation and runoff. The change is natural variability, but it will be affected by some human activities. At the same time, human activities, including greenhouse gas emissions, has an impact on hydrology. With the continuous change of climate, the process of hydrological environment changes should be studied in depth. Flood frequency treatment has become a key topic in the field of hydrological resources research, which has attracted the attention of foreign scholars. Under the common research, many factors affecting flood frequency are found, but some of them are not perfect. For example, the decomposition of hydrological event series is difficult to predict, and there is a certain degree of risk for the formation of prediction. Considering its intrinsic components, basin hydrological model can be used to set parameters. Combined with the physical conditions of the basin, the physical conditions of the changing environment are comprehensively considered. Under the circumstances of environmental changes, the change of hydrological regime will change with the identification of factors, which also affects the research. Furthermore, some traditional phenomena do not match the actual flood frequency distribution.

4.2 Study on the Regional Climate Model of Terrestrial Hydrology

For a long time, the process of regional hydrological change has been relatively complex, and climate change has a greater impact because of institutional problems. Climate change mainly affects the land water cycle. Usually, the study of the impact on water resources will start from the change of atmospheric circulation. If only from a single direction, there will be a lack of research on the interaction mechanism between water temperature and climate in the layer circle, which will also lead to seriously inadequate response mechanism of terrestrial water cycle under climate change. As the watershed water cycle includes land surface processes and the impact of human

activities on regional climate, this issue is a core difficulty for relevant scholars and experts. Key scientific issues are of great significance to the corresponding mechanism and mechanism changes of dew cycle in climate change.

4.3 Study on the Instability of Influencing Factors of Sewage Cycle

From the relevant data, we can know that the law of natural change is affected by human beings, and at any time or in any region has an impact on the hydrological environment. It will not only create a certain factual basis for climate change, but also become the main basis for correct assessment of the future. Due to the limitation of science and technology and the lack of relevant information, there are still many unsTable factors in current research. How to better reduce these unsTable factors is the main problem at present. It is necessary to strengthen the understanding of the internal factors so as to form a preliminary assessment of flood disasters. This is the direction and difficulty that must be studied under the current situation. Climate change has a certain impact on floods. Only by grasping this law can we ensure the relevant flood control work. It is essential to recognize the relationship between runoff, precipitation and submergence as well as the specific changes from various perspectives. In order to improve the accuracy of assessment and provide a better scientific basis for relevant scholars, it is necessary to conduct in-depth research on climate change and increase investment in scientific research.

5. Conclusion

In summary, climate change has a greater impact on floods, which involves relatively many complex contents. On the basis of the current situation, it is impossible to carry out in-depth research on it. Therefore, it is necessary to increase investment and apply more scientific forces to the research, which is conducive to finding out the changing law of the hydrological environment, grasping the specific situation of the flood disaster and doing a good job in the related prevention work.

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