

The Role of Hydraulic Engineering and Hydrological Forecasting in Flood Control and Drought Relief

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Abstract: For the agricultural development of our country, it is very important to do well the flood control and drought relief project, which is the key to the sustainable development of our country's agriculture and the precondition for the normal operation of agricultural production and life. In order to ensure the stability of regional agricultural economic development, it is necessary to strengthen the construction of hydraulic engineering and the work of hydrological forecasting, so that hydraulic engineering and hydrological forecasting can play their due value in the actual flood control and drought relief work. In view of the development in recent years, our country has attached great importance to the development of hydraulic engineering construction and hydrological forecasting, and improving the effectiveness of hydrological engineering and hydrological forecasting is one of the main objectives of hydrological development, therefore, we need to get effective attention, in order to achieve the future of our agricultural independence to lay the foundation.

1. Introduction

On the whole, our country is vast, rich in resources, complex terrain, variable climate, especially in summer, it is easy to flood and drought, which will have a serious impact on China's economic development. For flood control and drought relief work, the work of Water Conservancy construction and hydrological forecasting is very important. From the development of recent years, our water conservancy construction also began to integrate information technology, hydrological forecasting also began to apply to intelligent technology, the results are more significant, for flood control and drought relief work can provide greater help.

2. The Role of Hydraulic Engineering and Hydrological Forecasting

2.1 The Role of Hydraulic Engineering in Flood Control

The role of hydraulic engineering in flood control can be achieved in the following ways: (1) Building River Dykes. River dykes are usually built to prevent the problem of river flooding. The main purpose of building river dykes is to guide the direction of river flow scientifically and ensure the safety of residents' lives and property.^[1] Usually, after the river embankment is put into actual use, the damage caused by flood can be greatly reduced and the flood can be channeled to some extent, it can provide the corresponding condition for the development of our country's anti-flood and disaster relief cause; (2) construction of reservoirs. The reservoir itself is a kind of common dyke pool, the construction of the reservoir not only plays the role of storing water, storing water and generating electricity, but also can collect the extra water source of the river course when the flood happens, to promote the reservoir to maintain a certain amount of water, but also to regulate the peak of regulation and storage, play a role in alleviating river pressure.^[2] At the same time, it can also make full use of the warning water level of the reservoir, in the work of flood relief play a key role;(3) flood detention area. When a flood occurs, flood storage and detention areas can be used to store part of the flood water in time. For example, flood water can be stored in some low-lying depressions or lakes, this can mitigate the strong impact of the flood to some extent. The main function of flood detention area is to "Swallow up and spit down", that is to say, when flood occurs,

it can effectively reduce the flood peak and ensure to reduce the probability of flood disaster in a short time.

2.2 The Role of Hydraulic Engineering in Drought Relief

As a large agricultural country, the growing population, food security is the most important issue, which will have a direct impact on the overall economic development of our country in the future. In food production, drought is an important factor threatening food security, but also can urgently solve the needs of agricultural production and life. The main role of hydraulic engineering is not only basic irrigation, but also to provide important security for people's lives. At present, our country is also strengthening the construction of ecological civilization and paying attention to the improvement of People's awareness of environmental protection. However, due to the problem of multiple exploitation of the natural environment, the ecological environment in the vicious oh region has seriously deteriorated, as a result, there are significant gaps in the region's ability to prevent drought risks, and hydraulic engineering play a larger role.

The development of agriculture can not be separated from the irrigation operation, the climate of different regions in our country is quite different, the climate of some agricultural regions is changeable, the precipitation distribution of each big region is seriously unbalanced, if it only depends on the force of nature, it is difficult for our country's agriculture to get steady and sustainable development.^[3] Under these conditions, special irrigation projects are needed in some dry areas to ensure that water is stored in a timely manner during peak floods and that sufficient water resources are available for irrigation during droughts and to alleviate drought conditions, contribute to the sustainable development of agriculture.

2.3 The Function of Hydrological Forecast in Flood Control

In the process of flood control, hydrological information forecast plays a very important role. For example, when a flood disaster occurs in an area, the flood control department needs to plan the safe area at the first time, and promptly organize the rapid transfer of nearby residents. At the same time, it can also help residents transfer public finance, to minimize the economic losses caused by floods.

In this situation, it is necessary to make use of hydrological forecasting to collect more accurate and comprehensive information and data and to provide an objective and true reflection of flood conditions, can more accurately control hanghong in the best time to avoid the emergence of flood relief is not timely, resulting in threats to the safety of people's lives and property.^[4] In addition, hydrological information and forecasting plays an important role in the overall implementation of relevant flood control measures, it can collect all the data needed by the projects such as flood control building of river dike, and provide useful information support for them. By taking the result of hydrologic information forecast as the basic precondition, the bearing capacity of reservoir can be calculated, and the time of flood peak coming can be accurately grasped, and the best time of flood discharge can be controlled. It can be seen that whether the construction of flood control projects can reach the expected goal has a direct connection with the rationality of hydrological forecasting work. Therefore, it is necessary to master the flood disaster forces comprehensively, it is necessary to rely on the hydrological information forecast to carry out more efficient flood control work.

2.4 The Role of Hydrological Forecast in Drought Resistance

For the development of agriculture, it is easy to affect the development of our country's business, but also on the part of the people's lives and property security threats. In recent years, China's hydraulic engineering construction has been strengthened, hydraulic engineering facilities have been improved, and the ability to prevent and combat drought has been significantly enhanced. However, the drought has a number of factors, some of which are unavoidable in some regions, and therefore, the lack of water resources can easily lead to a more serious impact on local agriculture, food production will be greatly reduced, one hundred thousand million people will also have extremely difficult problems with river water.^[5] Drought is a perennial problem in some regions of

our country. Although some regions have been effectively affected by hydraulic engineering construction such as South–North Water Transfer Project, there are still serious drought problems in many regions. The light is very easy to lead to economic construction is obviously limited, heavy is very easy to lead to frequent natural disasters, or even because of the phenomenon of drought-related deaths. In the work of drought prevention and drought relief, the rationality of hydrological forecasting will have a direct impact on the overall level of drought relief. When carrying out drought prevention and drought relief, we can collect and collect information of rain and water regime in an all-round way according to the construction of hydrological stations, The hydrology department will be responsible for the arrangement, the total amount of water, the accurate analysis of precipitation, hydrology and other parameters in the light of local climate, humidity and other conditions, it does not provide a useful reference. Generally speaking, the development of hydrological information and forecasting can achieve a comprehensive collection and collation of drought information in specific regions, and on the basis of comprehensive analysis of data and information, more accurate drought forecasting and forecasting, to avoid drought prevention and drought relief efforts are not in place to cause significant impact on local construction and development.

3. Effective Measures to Facilitate Hydraulic Engineering and Hydrological Forecasting

3.1 Strengthen the Standardized Management of Hydraulic Engineering

Strengthening hydraulic engineering construction and management is an indispensable part of flood control and drought relief.^[6] In order to effectively improve the national economy and people's livelihood, the relevant departments need to establish a stricter system of regulations for deterioration, and promote the development of local water conservancy projects according to the drought and flood conditions in different regions, the basic standards for hydraulic engineering construction will be continuously improved through the introduction of regulations related to flood control and drought relief. At the same time, there is a need to develop flood detention methods to provide a solid guarantee for hydraulic engineering drought prevention.

3.2 It is Necessary to Strengthen the Training of Technical Personnel

At present, with the rapid development of knowledge economy, technical personnel, as the main part of hydraulic engineering construction, need to attach importance to and strengthen their own construction. In order to promote the rapid development of water conservancy in our country, we need to improve the professional quality of the staff from a more comprehensive perspective. The Water Conservancy construction department needs to set up a special personnel training plan to strengthen the technical training of the staff and improve the comprehensive quality of the staff. At the same time, it also needs to introduce a group of high-tech talents and strengthen the technical guidance, it is also necessary to clarify the distribution of authority and responsibility for each post and put the responsibilities of each person into place.

3.3 Strengthen the Supervision and Management of the Market

With the further development of the market economy, the construction of the Water Conservancy Engineering Bureau itself is becoming more and more intense, attention should also be paid to the construction of water conservancy construction supervision system. A hydraulic engineering project needs to go through many stages, from the establishment of the project to its subsequent construction and use. Each stage should be fair and transparent, so that all sectors of society can play a supervisory role, promote the quality of construction projects to be more effective guarantee, so that the hydraulic engineering flood control and drought relief effect can be more effective protection.

3.4 Actively Introduce Scientific Irrigation Technology

In the current green economic development, the concept of sustainable development in all fields, green agriculture has become the main direction of agricultural development. Compared with

traditional irrigation methods, many different water-saving irrigation methods, such as canal seepage control, pipe irrigation, etc. , can be popularized and applied more widely, which can reduce the cost of irrigation to the greatest extent, it can achieve the effect of irrigation with the minimum irrigation amount, obtain the maximum agricultural benefit, and promote the development and utilization efficiency of water resources. At the same time, it can also effectively promote the development of our country's agriculture and promote the sustainable development of agriculture.

3.5 To Build a Scientific and Perfect Scheduling Program

*The Departments of Water Conservancy construction shall pay more attention to the work of reservoirs and dams, and formulate more scientific and feasible dispatching plans, flood season flood control plans and emergency prevention and control plans, it is mainly used for the timely evacuation of personnel, and regular exercise and demonstration of the residents in the surrounding area to ensure that each of the plans can be put into place.*⁴ Effective measures to promote hydrological forecasting

3.6 Do a Good Job in Flood Season Hydrological Forecast

In general, hydrological forecasting needs to ensure the efficiency, accuracy and clarity of information, which is the most basic goal of hydrological forecasting. Therefore, there is a need to ensure that all aspects of information collection are reasonable, that all aspects of information collection are open and transparent, so as to ensure the accuracy of information analysis, and that in the process of collecting and developing information, there is also a need for compliance with the corresponding rules and strict compliance by each and every staff member, and for compliance with this basic guideline, the hydrographic staff involved in the work to be carried out in strict compliance with the corresponding norms and systems, ensure that each of the rain information transmission can ensure accurate and timely. In addition to this, there is a need for strict compliance with the general staff principle, that is to say, hydrographic forecasting staff need to carry out timely and effective processing of the information that they themselves collect and process, and always maintain a rigorous, serious and responsible attitude, especially in the face of some emergency situations, staff members need to report immediately to the relevant departments.

3.7 Do the Basic Work of Each Link

The hydrological forecast is a long-term and systematic work, and the quality of each work will affect the efficiency of the hydrological forecast. In general, to carry out hydrological work in time and ensure its efficiency, it is necessary to introduce the construction of automatic detection network system, which is an indispensable part of it, automatic detection system can effectively reduce the cost of human and material resources, effective link in which all kinds of staff pressure, as far as possible to reduce human problems caused by mistakes, to improve the comprehensiveness, accuracy and scientificity of hydrological forecast information, and to provide a strong guarantee for the subsequent flood control and drought relief work.

4. Conclusion

From the development of recent years, all kinds of industries in our country have undergone earth-shaking changes, and the development of water sector is also so. In order to effectively avoid drought and flood disasters, it is necessary to strengthen water conservancy construction and combine with hydrological forecasting, so as to minimize the losses caused by drought and flood disasters. From the perspective of actual development, the development of hydraulic engineering and hydrological forecasting needs to be improved and perfected from different aspects. On the one hand, there is a need to raise awareness, strengthen flood prevention preparations and strengthen the construction of professional teams, in order to improve the level of hydrological forecasting, we need to strengthen the supervision, especially in the construction of hydraulic engineering, need to

ensure openness, transparency, so as to ensure the accuracy of information forecasting, give full play to the important functions of flood control and drought relief.

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