Problems Existing in the Treatment of Small Sick and Dangerous Reservoirs and Their Countermeasures

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Abstract: Agricultural production plays a very important role and position in China. Reservoir is one of the indispensable facilities in the process of agricultural production and development. The quality of reservoir construction is directly related to the level of agricultural production. The article mainly focuses on the small-scale dangerous reservoirs in China at the present stage, and puts forward various problems in the operation and management of small reservoirs. At the same time, systematically analyzes and studies the causes of the problems, and finally puts forward corresponding the governance measures and recommendations have certain reference value.

1. Introduction

In the context of rapid socio-economic development, the construction of small reservoirs has been increasing, and a large number of examples show that high-level management measures are crucial to the role and value of small reservoirs [1]. To increase capacity and restore storage capacity to reduce sediment and reduce siltation is an effective way to improve the reservoir's own benefits and social benefits to solve regional water shortages [2]. However, most reservoirs have different leakage problems. Because of different reservoir scales and different flood control standards, there are certain safety hazards for farmers and farmland downstream of the reservoir [3]. Therefore, the water conservancy and industry departments and survey departments must attach great importance to speeding up the reinforcement of small and medium-sized dangerous reservoirs and consolidating the achievements of the reinforcement of large and medium-sized dangerous reservoirs so as to control the capacity of water resources [4]. Fundamentally solving the engineering geological problems of dangerous reservoirs is conducive to eliminating the threat to downstream cities, and objectively adopting reinforcement and renovation methods to avoid reconstruction can also save a lot of money.

2. Analysis of Problems in Small Sick and Dangerous Reservoirs

2.1. Lack of propaganda and coordination in reservoir construction

Over the years, the state and local governments have attached great importance to the management of small dangerous reservoirs, because the safety of reservoirs is directly related to the safety of the whole downstream flood control area. Some engineering designs deviate greatly from the actual construction situation. Some small reservoirs have a large amount of actual works, some even doubled. The relevant departments did not publicize the importance of the construction of the dangerous reservoir and the particularity of the project, resulting in the loss of widespread support from the society. In addition, biological factors will also affect the reservoir dam foundation, causing leakage of the dam foundation; secondly, the reservoir operation management level is low. The reservoir has been running for too long, causing the reservoir to age. In the specific reinforcement process of the dangerous reservoir, because the large area will involve the economic interests of the local people, this will create obstacles to the management of the dangerous reservoir.

2.2. The serious aging facilities and delayed maintenance

After a long period of operation, some uneven settlement often occurs in the dam foundation and

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other places, forming a natural aging phenomenon. The construction of small reservoirs is early and the facilities used are simple. With the increase of service life, many facilities are aging seriously, which has a significant impact on the normal operation of small reservoirs. Some of the outer slopes of the reservoir are trampled and destroyed seriously by human and livestock. At the same time, the problems caused by the related equipment and facilities are becoming more and more serious in the later period, and even many of the equipments are no longer able to continue to be used. In many areas, problems such as blockages, leakage, and cracking of the dam have occurred, which has seriously affected the operation of small reservoirs. Safety and stability.

2.3. Poor project management

Many small reservoirs are not equipped with special management personnel, and the management system is not perfect. Very golden reservoirs have no observation and testing equipment, and lack of necessary transportation, communication, water condition reporting and other facilities. Many reservoirs did not excavate the spillway or were not excavated after completion. The spillway capacity of the spillway did not meet the design standards. In the process of putting the reservoir into normal operation, there is no sound management mechanism and the science-oriented approach has been lost; Water management units lack professional and technical personnel, management institutions are out of balance, management technology is backward, and management system is not perfect. There is no written record, no observation and detection equipment, no effective monitoring means for displacement, deformation and leakage, no major events for the operation and management of the reservoir, and most of the operation, maintenance and safety monitoring of the dam have not been achieved.

2.4. Poor quality assurance system

There are some problems in many engineering project construction units, such as the uneven quality of supervisory engineers and supervisors in engineering supervision units, which can not meet the needs of supervision work, and unclear property rights and responsibilities in specific management. The construction of small reservoirs is basically completed by the government to organize the masses to carry out mass movements. The construction process and construction quality are basically not controlled. As a result, most reservoir dams have different levels of leakage problems. The security officer does not operate according to the bidding documents; the three inspection systems of the supervision unit are not implemented; the engineering data of some reservoirs are not standardized.

2.5. The limited funds invested by small reservoirs

In China, the construction of small reservoirs is generally financed by local governments, and the state will give some necessary support policies. Most of the small reservoirs are built in remote areas. Because the local government has limited funds, financing difficulties often arise in the development and construction of small reservoirs. Judging from the current status of the management of the dangerous reservoirs, the lack of matching funds is the main factor restricting the further reinforcement of the dangerous reservoirs. This has also led to poor quality of these projects, and the construction of low-standard reservoirs has repeatedly occurred in the course of operation, posing a threat to the safety of local people's lives and property.

3. Control Measures for Small Sick and Dangerous Reservoirs

3.1. Improving flood control standards of reservoirs through scientific design

To improve the flood control standards of reservoirs, we should focus on the following two aspects: First, increase the construction of dam height, improve the normal flood control capacity of the reservoir, and provide security for the residents downstream of the reservoir. According to the engineering level of the reservoir, the hydrology is recalculated and the design flood is compounded [5]. For small reservoirs with insufficient dam height and narrow crest width, the crest elevation, crest width and slope of the dam should be determined first. Secondly, the purpose of expanding

spillway by scientific design is to increase the discharge of reservoir continuously, and to provide favorable guarantee for the safe operation of reservoir.

3.2. Exploring the establishment of a new type of management model

According to the characteristics of small reservoirs, the principle of proper separation of ownership and management rights, and the actual situation of the reservoir, the management and protection model based on local conditions, centralized management and social management is adopted. The main purpose of this is to systematically and comprehensively monitor the dynamic changes of the water environment of the reservoir, fully grasp the changing state of the reservoir water environment, and create the most favorable conditions for the reservoir water environment management and prevention. In accordance with the requirements of the state and relevant norms, we should conscientiously carry out safety appraisal, design and approval of construction bidding, quality management, project acceptance and other links, strictly implement the project legal person responsibility system, bidding system, construction supervision contract management system and completion acceptance and other construction management systems to ensure the quality of the project.

3.3. Increasing investment and publicity

The government and relevant departments should pay more attention to reservoir management. Although the investment in reservoirs has been increasing in recent years, reservoir diseases have emerged in an endless stream. The funds invested by the state can no longer meet the needs of reservoir construction and disease prevention. Scientific researchers should follow the frontier of the development of water resources industry and carry out selective, comprehensive, forward-looking and strategic basic research around the central work of people's livelihood water resources development [6]. For those reservoirs with poor filling quality and large seepage of dam foundation, the dam body grouting and anti-seepage grouting must be carried out in order to play a reinforcing role. In addition, it is necessary to strengthen the propaganda of the role of the reservoir, so that more people in the society pay attention to the management and construction of the reservoir, increase the source of funds for reservoir construction, and enable small-scale reservoirs to be timely treated. On the basis of inheriting and carrying forward the technology and experience of traditional engineering, we will continue to learn from the new ideas of management and construction of dangerous reservoirs at home and abroad. We will increase the intensity of independent innovation and continuously improve the level and level of technological innovation.

3.4. Strengthening the construction of reservoir engineering quality

In the reservoir foundation and flood discharge gates, some places where leakage is more likely to occur, they are processed into some round holes by drilling rigs, and then concrete is injected into them through grouting, and then in the reservoir and lock chamber. Form a holistic concrete cut-off wall. Focus on solving the problem of poor spillway width. The unlined spillway should be lining in time to ensure that the spillway can safely discharge floods and make the whole dam safer. Of course, this integral concrete cut-off wall is often used in the anti-seepage of earth dam body. The concrete cut-off wall is mainly divided into two forms, namely, slotted plate cut-off wall and pile cut-off wall. Not only that, the application of new materials and technologies has also greatly improved the quality of the reservoir and prolonged the service life of the reservoir.

3.5. Updating and replacing reservoir equipment and facilities in time

The operation efficiency of reservoir equipment and facilities is the main standard to measure the management level of a small reservoir. Therefore, according to the operation status of the equipment and facilities of the small reservoir, the equipment and facilities must be replaced and updated in time to ensure the continuous, stable and efficient operation of the reservoir. In view of the sources of funds in the management of small-scale dangerous reservoirs, we should take government investment as the core and market financing as the supplementary sources of funds, encourage the society to invest actively in the construction of reservoirs to the greatest extent, and

clarify the responsibilities of various departments in the construction process. Relevant departments should also strengthen management and monitoring, use advanced equipment and management tools to enhance monitoring, timely discover the hidden dangers of dams in the operation process and adopt reasonable measures to solve them. Therefore, according to the operation of the reservoir equipment, timely updating can not only improve the management level of small reservoirs, but also effectively protect the safety of residents and crops.

4. Conclusions

Judging from the situation of reservoir operation in recent years, the reservoir has played a very important role in agricultural production. It can be said that there is an inseparable relationship between the output value of agricultural production and the effect of reservoir operation. Reinforcement of small reservoirs is a long-term work. Therefore, we must carefully analyze the diseases and the causes, and then prescribe the right medicine. In the process of reservoir construction, we must also pay attention to the quality control, and do a good job in the early stage survey, thus reducing the occurrence of reservoir diseases. There are still a series of problems to be solved urgently in the concrete operation and management of small reservoirs in China. It is necessary to clarify the scope and objectives of management reform, explore and establish a new management and protection mode, and update and replace the equipment and facilities of reservoirs in time in order to maximize the management level of small reservoirs.

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