The 3rd International Conference on Materials Chemistry and Environmental Engineering
DOI: 10.54254/2755-2721/3/20230538

Analysis of hydropower development in China

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Abstract. With the environmental destruction becoming more and more serious, all the countries on earth pool their minds to solve the environmental problems. The use of carbon is one of the most serious problems causing environmental pollution. The country's rapid development leads to excessive carbon emissions. To solve this problem, the country is researching and developing new energy sources. For China, water resources are part of the solution. If reasonable development and good use of water resources, can properly relieve the pressure brought by environmental pollution. This paper summarizes China's previous hydropower generation, and puts forward some suggestions in order to improve China's hydropower technology and reduce the damage to the environment.

Keywords: hydropower development, explore innovation, flourish, environmental protection.

1. Introduction

In April 2016, then-Chinese Vice Premier Gaoli Zhang signed the Paris Agreement on behalf of President Jinping Xi. And in September of the same year, the Standing Committee of the National People's Congress was approved to join the "Paris Climate Change Agreement". To actively respond to the international call, China is also constantly researching and developing new energy sources to replace fossil fuels. This reduces damage to the environment. Hydropower technology is currently the focus of China's development, even if there are still some problems.

The total amount of hydropower resources in China is very rich, and the development potential is also very great. Like the Yangtze River and the Yellow River, they continue to grow, giving birth to the splendid Chinese civilization. But our country's water resources are relatively scarce, and the spatial and temporal distribution of precipitation is very uneven. So, in today's rapid economic development, we are increasingly big for the demand for energy, a reasonable understanding and analysis of water conservancy development of our country for environmental protection and the promotion of economic development is also of very important significance.

With the continuous development of society, the concept of water conservancy is also in constant change. In the beginning, the concept of water conservancy consisted of only three aspects, namely flood control, transportation, and irrigation. Mainly water resources for our human society development of the beneficial side. But with the development of the current society, the scope of the concept of water conservancy is also constantly expanding, adding water supply and drainage, soil and water conservation, water pollution prevention and control and water landscape transformation, and so on [1]. It can be seen that the current water conservancy is more and more satisfied with the needs of human production and life.

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This paper gives a rough overview of the current development of China's hydropower and the data of some foreign advanced hydropower technologies, so as to give some suggestions that can promote the development of China's hydropower.

2. Analysis of the hydropower resources in China

China is rich in water resource, but the per capita water resources is very poor countries, roughly seventy s of the 20th century in our country and then open water scarcity, in the eighties, the shortages in our country also started to have the initial part of the extension to the national situation is becoming more serious, the development of national economy also brings adverse effect [2]. At present, according to the relevant statistics, we can know that the annual drought area of our country is 2 to 2.6 million square kilometers, seriously affecting the grain output and industrial output value and even in our country there are 70 million people who are in difficulty in drinking water [3].

At present, there are two main problems facing the development of water resources in our country, which are uneven distribution of water resources, serious water pollution, and a serious waste of water resources [4].

To begin with, the distribution of water resources in our country is very uneven, showing a "more in the south and less in the north, more in the east and less in the west" distribution. The area south of the Yangtze River basin occupies 36.5% of the country's total land area, but 81% of the country's water resources. Not only that, China's distribution of precipitation is unbalanced, and drought and waterlogging are very frequent. In our country, most of the precipitation is concentrated in some four months, which has nearly occupied more than 70% of the annual precipitation. As a result, China has many pipelines that continue to deliver electricity and water to the northwest. In fact, water resources exist in the northwest of China, but because of the steep topography in the northwest of China and the fluctuating temperature throughout the year, a lot of water resources cannot be used rationally. Trying to use water in the northwest will require a lot of money. Even if a lot of money is invested, water utilization will be very low, so the northwest has hardly been exploited.

Secondly, in recent years, water pollution in our country is becoming more and more serious, our country's annual sewage emissions can reach 36 billion tons. Apart from 70% industrial wastewater and less than 10% domestic wastewater, the rest of the sewage is mostly untreated and discharged into the river, which also leads to serious changes in water quality. At present, water resource waste is also very serious in China. According to the relevant data, our country's water consumption per ten-thousand-yuan GDP is 406 tons, which is four times the world average level [5]. Part of the environment has been sacrificed for the development of science and technology. Wastewater from factories is often smuggled and dumped into local rivers because of the need for channels and the high cost of treating sewage.

3. Outsanding hydropower constructions in the world

Looking around the world, there are still many hydropower projects worth learning about. For example, Presa De Itaipu at the border of Brazil and Paraguay. The hydroelectric plant supplies 17% of Brazil's electricity consumption and 75% of Paraguay's electricity consumption. And it has been put into use as early as 1984, and it can still operate normally today. The Guri Dam from Venezuela is also famous in the world. The Guri Reservoir that supplies the dam is one of the largest on earth, which provides 80% of Venezuela's electricity.

The United States also has a famous hydropower station, that is the Grand Coulee hydropower Station. It is located in Spokane, Washington as a large water complex. It was completed in 1980 and was the largest hydropower station at the time. The Daguli Hydropower Station has many different functions, such as power generation, flood control, irrigation, urban water supply and improved shipping. The Grand Guli Hydropower Station is so excellent because of the thinking of the builders. Before the construction of this hydropower station, the local government decided that the Grand Guli Hydropower Station should not only be used for power generation, but also for other purposes. As a result, the hydropower station can bring great economic benefits. In addition, the dam was equipped with the most advanced technology in the United States at the time, resulting in a total installed capacity of 6,494,000

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kilowatts in 1979. In addition, due to the existence of Daguli Hydropower Station, a series of downstream flow power stations can generate electricity in winter, so in Washington State, hydropower generation accounts for 85.3% of the total. To sum up, Daguli Hydropower Station not only increases the power generation, but also exerts the comprehensive effect of water resources, especially for shipping and fishery protection, thus achieving the harmony between science and nature.

Another hydropower station worth mentioning is the Inga hydropower Station located just past. First, because the Congo River is so long, it is roughly divided into multiple stages, all of which are combined together to form the Inga hydropower Station. It consists of 11 DAMS and 6 hydropower projects. Because the water level of the upper Congo reaches about 100 meters, all water is diverted upstream without DAMS. Because of the use of the Nkokoro Valley, which is flush with the river on both banks, the flow rate can increase gradually as the plant becomes operational. But because there are no DAMS to divert water, only about 15% of the water is used. Although not much water is used, the hydropower station is a combination of technology and the environment. Congo River basin and area is second in the world, after the Amazon River. It was the drop of Inga Falls that led to the decision to use undammed water. While 15% may sound like a small amount, it is important to consider that the Congo River is the second largest river in the world and relatively small among the many hydroelectric DAMS that have not been completed and are still being improved. But it is already a famous hydropower station with great characteristics in the world.

4. Suggestions on promoting the Hydropower Development

With the continuous development of science and technology, the development of water conservancy can not only be limited to traditional water conservancy development but also pay more attention to modern water conservancy development. This also means that we must pay full attention to the study of the relevant theories of water conservancy development, and continue to arm our minds with scientific theories to guide the direction of our national water conservancy development [6]. In addition, in the development of water conservancy, we should not only pay attention to the study of theory but also pay attention to the practical application of theory. We should fully pay attention to the realistic situation of China's water conservancy development, to better promote the development of water conservancy [7].

Especially for some students, study water conservancy development-related majors should also continue to strengthen the study of water conservancy related theories, learn more water conservancy frontier theories and provide more professional talent reserve for our country's water conservancy development, and promote the modernization of water conservancy development. Dare to give young students the burden, so that they can constantly improve their ability in practice.

While the CPC Central Committee is carrying out comprehensive rule of law, relevant rules and regulations on water conservancy development should also be constantly improved, to provide a more powerful guarantee for water conservancy development. On the one hand, it is built based on laws and regulations, but also to constantly improve the law enforcement system [8]. Only in this way can we further plan, develop and utilize water resources. On the other hand, the problem of wasting water resources should be strictly regulated. Science and technology are the primary productive forces. The improvement of science and technology can ensure the modernization of water conservancy development. Continuous improvement of the technical level of water conservancy development can effectively promote the process of modernization of water conservancy development [9]. For example, the combination of water conservancy and information technology, and other modern technologies can establish good real-time monitoring and management of water bodies, which also helps professionals to carry out effective, scientific, and more convenient management of water resources. The Party can develop in times when there is an emergency, and effective measures in this channel will further enhance the function of disaster prevention and mitigation in the development of our national water conservancy.

In addition, the use of science and technology unceasingly to promote the green development of water conservancy in our country must be taken seriously and properly handle the problems and challenges of water conservancy development, insist the harmonious development of man and nature, already let the development and utilization of water resources are enough to meet the need of human

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production and living, but also, avoid excessive development and great destruction [10]. It should not only meet the needs of the current generation but also estimate the survival and development of future generations. The water conservancy development in China can exert its economic benefits on the basis of protecting the ecological environment and benefiting people.

5. Conclusion

In conclusion, at present, the development of our country's water conservancy has also made very big progress and has been at the forefront of the world.

If government want to make improvements, the first thing they need is a combination of theoretical knowledge and practice. Because hydropower generation is a relatively new technology, there are still many fields to be developed, so students need to cultivate more talents in this field. Secondly, the national rules and regulations for water conservancy construction also need to be improved. After all, this is a relatively new technology, and many aspects need to be improved such as water waste and water detection. New technologies must be protected and developed by strict laws. Finally, the combination of technology and environment. In many cases, the environment is sacrificed for the development of science and technology, which is one of the reasons for the emergence of hydropower. The rational combination of the two can better help the country and even the world to develop water projects.

But at present, the development of our national water conservancy is still to pay attention to the modernization of water conservancy development, and on this basis constantly promote our water conservancy development in line with the advanced technology of international water conservancy and further improve our water conservancy development.

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