

Research on Wetland Problems and Management Measures in Niangniangshan National Wetland Park in Liupanshui

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Abstract: Liupanshui Niangniangshan National Wetland Park is known as a rare water tower in the Pearl River region. It is a "two mountains" practice sample of "three changes innovation · Landscape transforming into gold" in Southwest plateau wetland. The wetland park plays a very important role in the economic development and people's life of the whole region. In order to better protect and develop the wetland, the local government contacted relevant experts to evaluate the value of the wetland. After investigation, in order to better protect and develop the wetland, it was decided to build the park into an ecotourism place, thus helping the rural revitalization. This paper takes the wetland of Niangniangshan National Park in Liupanshui as the research object, and analyzes the degradation causes and restoration measures of the wetland through field investigation and literature research. It aims to put forward feasible strategies for wetland protection and restoration according to the actual situation, realize the sustainable development of wetland resources, maintain the security of regional ecosystem, and improve the quality of ecotourism to help rural revitalization and benefit local people.

Keywords: Plateau wetland, degradation causes, countermeasures and suggestions

1. Introduction

Since the 18th National Congress of the Party, efforts have been made to implement the General Secretary's ecological civilization thought and promote the practice of green development based on the "two mountains theory". Panzhou City has built Niangniang Mountain Wetland Park into the "two" three changes innovation landscape gold" Mountain " practice sample, has become a typical representative case of rural ecotourism to help rural revitalization. Known as "the rare water tower at the source of the Pearl River", it is a natural barrier for water ecological security in the Pearl River Basin. As a typical representative of the swamp wetland in the karst mountain area of Guizhou province, the peak platform of Niangniang Mountain effectively protects the unique ecological function of the karst mountain area of Yunnan-Guizhou Plateau, which is of great significance to the regional ecological security. But with climate change and human activities and the impact of the epidemic, the wetlands have shrunk dramatically. Many wetland waterscape in the scenic spot are abandoned due to the cut-off, and the number of tourists is significantly reduced compared with the beginning of the development. The poor economic income makes the management and operation costs of the scenic spot inadequate. Such a vicious circle, the survival of the landscape is in danger. In particular, the water resources contained in the wetlands are of great strategic significance to the regional development. The chain effect caused by the wetland changes is closely related to the downstream people's life and social development^[1], which is related to the sustainable development of the rural revitalization strategy of the whole region. The status of the tourism landscape of Niangniang Mountain is very important in Panzhou city. All the development of this hot land is pulling the heart of everyone in Panzhou. Zhang Chi, a deputy to the National People's Congress, proposed in the 732 document that the higher authorities could set up a special fund to strengthen the protection of Niangniang Mountain Wetland Park, and the Forestry Bureau of Guizhou Province also responded to this suggestion and made relevant instructions to apply for management funds through multiple channels metals. In order to better understand the situation, on May 31, 2023, Hu Hongcheng, secretary of the Party Group and director of the Provincial Forestry Bureau, led a team to investigate the Niangshan Wetland Park in Liupan, and proposed that the Niangshan wetland developed in the karst plateau mountain Niangshan National Park is a typical karst mountain wetland resources and ecological land, which is of great

significance to the region and even Guizhou. Therefore, it is urgent to analyze the causes of wetland degradation and explore the methods of wetland restoration and protection.

2. Overview of the Study Area

Overview: Niangniangshan National Wetland Park, the geographical coordinates are 104 °45 '24 " - 104 °51' east longitude 41 ", 26 °4 '25 " - 26 °8' 24" north latitude. The area between the junction of Panzhou City and Shuicheng County in Guizhou Province involves Pugu Township, Mudu Township and Baoji Township in Panxian County, Longchang Township, Shunchang Township and Huajia Township in Shuicheng County^[3]. It is known as the "rare water tower at the source of the Pearl River" and is a natural barrier for the water ecological security of the Pearl River Basin. The wetland park has a wetland rate of 39.5%. On the platform of the summit, large areas of pure sphagnum moss are cultivated in some wetlands due to the impermeability of basalt. Sphagnum moss can store more than 20 times its own weight in water, providing water for local villagers and water features in times of drought. To better protect the wetlands, functional departments will organically combine the mountain platform swamp wetland with the Local agricultural sightseeing park being constructed in the mountain trunk, and absorb private capital by declaring the construction of a national wetland park. To build an eco-tourism place, it is planned to use eco-tourism to drive the economy around the countryside, thus helping the rural revitalization. The planned area of the scenic spot is 275 square kilometers and covers an area of 2680 hectares. It is rated as a national AAAA tourist scenic spot^[3]. The scenic spots created include Liuchehe Grand Canyon, Tiansheng Bridge, Tianshan Waterfall, Water curtain Cave and other karst landscape landscapes, many of which are supplied with water from wetlands. However, with the impact of climate and human activities and epidemics, the scenic area is wet Large areas of land degradation and wetland conditions are worrying^[3].

3. Current Situation of Niangniang Mountain Wetland Park

3.1 The Wetland Area was Reduced and Degraded

Through visiting the site, it was found that the area of the wetland was seriously shrinking, and the wetland was overgrown with weeds, which had been occupied by a large number of ferns. (Figure 1) Part of the wetland has been used for planting Chinese fir forest. On both sides of the entrance of the scenic spot, a large area of local specialty black potato and other food crops are planted, which directly and indirectly affects the wetland area seriously.



Figure 1 is taken from the scene

3.2 Water Pollution and Water Resources Scarcity

At the entrance of the park, there is a large amount of arable land around the park, the water drain produced by agricultural activities and the impact of water and water quality, which pose a threat to the health of the wetland ecosystem. Studies have shown that water quality and soil pollution can result in a biodiversity reduction. The use of drainage ditches will lead to the degradation of wetlands due to the

lack of water supply. In the field investigation, many water features are cut off (Figure 2). The ornamental value of the wetland landscape has decreased significantly.



Figure 2 is taken from the scene

3.3 Insufficient Management and Disorder in the Park

The park currently faces management challenges, including the lack of adequate monitoring and supervision mechanisms, and the lack of effective law enforcement and conservation policies, making wetland resources vulnerable to unauthorized use and destruction. For example, the wetland reserve boundary monument is damaged, the boundary protection is not clear, the hillside land reclamation is serious, and the solid waste in the park is much scheduling problem.

4. Cause Analysis

Through literature research and field investigation, the causes affecting wetland degradation are divided into three categories, First, policy management, second, human activities, and third, climate change.

4.1 Protection System, Supervision System and Evaluation System are not Perfect

Since China joined the Wetland Convention in 1992, various policies have been introduced to protect wetlands. In 2016, the General Office of the State Council issued the "Wetland Protection and Restoration System Plan," which clarified the fundamental principles and tasks of wetland protection and facilitated the progress of local wetland legislation. However, scholar Zheng Hui found that the local wetland protection regulations in 27 provinces are not perfect. The author believes that a complete wetland protection system should include (1) inter-departmental cooperation and communication mechanism - wetland protection committee system or joint conference system; (2) Wetland conservation information exchange and sharing mechanism -- information sharing system; (3) Law enforcement cooperation mechanism - wetland protection law enforcement cooperation system; (4) Auxiliary system of wetland cooperation mechanism -- inspection system^[6]. Through statistical analysis of these 27 provinces, it was found that none of them are fully covered by the four protection systems. During the visit to Nianguang Mountain, it became apparent that issues such as reclamation development, environmental pollution, and unclear protection boundaries stem from the shortcomings of the wetland investigation, monitoring, supervision, and evaluation system. The imperfection of these systems will lead to the lack of timely feedback on the threat of wetland resources. After the promulgation of the protection policy, there is still a lack of subsequent landing allocation Set measures. Wetland protection reporting system also lacks a response mechanism.

4.2 Human Activities

Human activities will cause ecosystem disorder and function weakening, resulting to habitat fragmentation, reduced animal and plant resources, declining health status of wetland ecosystem, and decreased production capacity of wetland ecosystem^[1]. China's arable land area only accounts for 7%

of the world's arable land area, but it feeds 22% of the population, and the contradiction between land and man and land is prominent. With the development of economy, the number of population growth, the pressure of human survival is too large, land reclamation becomes logical. At present, the reclamation of farmland and urban development are still the main reasons for the reduction of wetland area^[6]. At the same time, animal husbandry, planting and construction will cause the reduction of wetland area. It causes the loss of biodiversity, the weakening of water conservation function, water purification and other functions, resulting in the deterioration of environmental quality. However, due to the epidemic situation and poor management, Niangniangshan National Park has made it a problem for local people to survive. Some people fail to participate in the distribution of benefits of wetland park protection, and lack the motivation to protect wetland resources. Forced to make a living solely through traditional means such as agriculture, animal breeding, animal husbandry, and tree planting. In conclusion, the main human activities affecting the wetland degradation of Niangniang Mountain Wetland Park include excessive animal husbandry and soil Land reclamation, artificial afforestation, theft of sea flowers, water conservancy construction, and these behaviors are a great cause of wetlands influence of.

4.2.1 Impact of Animal Husbandry on Wetlands

Overgrazing can result in plant trampling and reduced vegetation. The urine and feces left by livestock in the wetland contribute to a high urea load, surpassing the wetland's natural purification capacity and leading to wetland water eutrophication. This damages the water quality structure of the wetland.

4.2.2 Influence of Land Reclamation on Wetlands

Studies show that land reclamation will lead to changes in the soil properties of wetlands, leading to biodiversity reduction, water resources problems, increased flood risk, weakened climate regulation, and soil quality decline and other hazards. Studies have shown that artificial afforestation, which requires water for its growth, reduces surface runoff and aggravates wetland degradation. Article From 2000 to 2015, 57.05% (more than 250.00 km²) was wet Land disappeared, of which 39.22% were converted to grassland, which mainly caused this by overgrazing and opening Reclamation .

4.2.3 Influence of Water Conservancy Construction on Wetlands

As one of the three major ecosystems on the earth, the wetland is a type of land between the land and the wetland. Strong dependence on water, but water conservancy and road construction will lead to the fragmentation of wetland landscape and habitat, and weakened hydrological connections. For example, the artificial ditch will drain the water on both sides of the channel, making the surrounding marsh mud carbon dehydration harden. Once the wetland is dehydrated, the moss born in the wetland will lose its living environment, and then breed other plants and gradually retreat Into a grass^[6]. The large area of wetland in the wet area of Niangniang Mountain has been occupied by ferns, which is a kind of wetland Degradation.

4.2.4 Effects of Pollution and Waste Discharge on Wetlands

Discharge of industrial wastewater, agricultural chemicals and urban sewage, as well as improper disposal of solid waste can lead to wetland water and soil pollution. It will destroy the habitat conditions of wetland organisms and aggravate their destruction, thus aggravating the process of wetland degradation. When visiting Niangniang Mountain Wetland Park, I found that there was no unified storage place for garbage and the overall scene. The area is more abandoned phase.

4.3 Climate Change

An important factor affecting the change of wetlands is climate change. Climate influence mainly affects wetlands from temperature and precipitation. Among them, different wetlands are differently affected by climate, lake wetlands are mainly affected by precipitation, and marsh wetlands are mainly affected by temperature. The spatial distribution and size of precipitation will determine the distribution of wetlands. Since there are wetland plants in marshes, rising temperature will lead to rising soil and hydrological temperature, and water evaporation will become the main natural factor, which is not conducive to moss growth. When the soil is too dry, other plants will breed, which will accelerate the degradation of wetlands into grassland. According to news reports, Liupanshui Dish City has been experiencing severe drought since January 2023. The rainfall in Dish City, Guizhou, has reached a record low of only 66.7 mm, which is 70.1% less compared to the same period. As a result, the water levels in small and medium-sized reservoirs have sharply dropped, leading to numerous instances of

broken ditches, dried-up wells, springs, mountains, and water cellars. Most townships in Dish State are facing a drought level classified as "drought." The Niangniang Mountain Wetland Park is situated at the junction of Pan County and Shuicheng [7].

5. Countermeasures and Suggestions

The sustainable development of Niangniangshan National Wetland Park is inseparable from the effective management of professionals. However, due to the lack of funds, the lack of professionals and the lack of cognition of surrounding residents, the survival of the wetland is at danger. Give the following advice.

5.1 Apply for the Management and Protection funds of wetland Park

The protection and management of the wetland park cannot be without professional personnel and operating capital. The relevant staff of Niangniangshan National Wetland Park should request the support of the higher authorities and apply for the relevant funds for the management, operation and protection of the wetland park under the guidance of the higher authorities. Firstly, in compliance with the "Guizhou Provincial Forestry Reform Fund Management Measures", we will guide the park management department in project planning and declaration of provincial forestry reform fund projects. Second, by striving to declare Liupanshui Niangniangshan National Wetland Park as a "national important wetland", the wetland park will be included in the central financial forestry grassland ecological protection and restoration (wetland protection and restoration) to obtain financial support. Third, in the context of the policy support of the Master Plan for the Protection and Restoration of Major National Important Ecosystem Projects, we will strive to apply for the protection and restoration of the ecological environment system and green development demonstration project of the Yangtze River Economic Belt, and improve the supporting facilities for wetland park protection.

5.2 Build a Professional Wetland Park Management Talent Team

Through talent recruitment and other means, we aim to build a professional team of experts to enhance the management, protection, and restoration of wetlands. This will involve strengthening communication with provincial forestry departments and seeking additional funding support from higher-level authorities to ensure effective management and conservation. We will also focus on implementing appropriate staffing measures to establish a stable and skilled personnel team dedicated to addressing the lack of professionals in wetland park management.

5.3 Increase Investment in Education and do A Good Job in Science Popularization and Education

Human activities have become one of the major reasons for the reduction in wetland areas, and much of this behavior is driven by economic concerns. Therefore, it is essential to approach this problem from the perspective of "people's living difficulties". As people's living conditions improve, the destruction of wetlands will naturally decrease [8]. Additionally, it is crucial to increase the scale of science popularization education. This can be accomplished through the production and distribution of educational materials and the implementation of outreach activities focused on topics such as the relationship between wetlands and human survival, wetland biodiversity, ecological characteristics, and so on. These efforts are designed to enhance public awareness of the critical role that wetlands play in the human living environment [9].

5.4 Improve the Legal System and Strengthen the Supervision and Compensation System

To improve the protection of wetland resources and maximize the benefits that wetlands provide, it is necessary to enhance the legal system. This should involve fully leveraging the existing laws and regulations pertaining to wetland resources protection, as well as implementing assessment and responsibility systems. To ensure effective implementation, it is important to establish a "no policy above, no action below" approach. Additionally, parks must be subject to increased supervision to minimize the damage caused by human activities to wetlands. We will introduce a compensation policy to make economic compensation for those who have lost their interests.

5.5 Increase Investment in Scientific Research and Science and Technology, and Implement Scientific Research Monitoring Plans

To inform our scientific research, we will engage with wetland research experts from the plateau and develop restoration and management plans that are tailored to the specific conditions of the region. This will involve making recommendations based on an in-depth understanding of the realities on the ground. In terms of patrol prevention. With the help of scientific and technological power, the formation of technical defense patrol. Thus strengthening the empress mountain wet The technical patrol level of the park, improve the protection of the Niang Mountain wetland. If installed by applying for protection funds Construction of video monitoring equipment, so as to access to the "Liupanshui Forestry Cloud" management platform, the core conservation area is heavy Point monitoring, through monitoring the activities of the conservation area, through the broadcast prompt reminder of personnel activities. Increase the wet Propaganda of land protection. Practice has proved that the establishment of a global wetland dynamic monitoring system is very important to wetland management and protection Yes, he can assess the condition of the wetlands. Monitoring through remote sensing and field observation is an effective technique for monitoring global wetlands. He can grasp the dynamic changes of wetland ecosystem in time. The implementation of field observation mainly includes the establishment of monitoring points, monitoring stations, monitoring centers, monitoring databases and wetland information management platforms. At the same time, the monitoring results were evaluated to provide timely reference information for wetland protection and restoration^[10].

5.6 Synchronous Protection and Restoration of Damaged Wetlands

A large area of wetland degradation has occurred in Niangniangshan National Wetland Park. How to restore the wetland is the focus to solve the current problem. The following methods are summarized through literature research for reference: 1. In terms of hydrological restoration, soil moisture is carried out by filling drainage ditches, holding and controlling water level on ditches. 2. In terms of vegetation restoration, the Nbs concept of natural restoration is adopted to give priority to natural restoration and be supplemented by artificial restoration, such as: enclosure fencing, reasonable rotational grazing, play the role of seed bank, and meet the needs of natural vegetation renewal. 3. The water storage capacity was improved by reasonable fertilization and artificial planting of sphagnum moss. Professionals should be consulted to conduct zoning studies on degraded wetlands and develop restoration plans accordingly.

6. Conclusion

The crisis of Niangniangshan National Wetland Park is related to the regional economic development and the water supply safety of the wetland area Full, flood control safety and ecological security[1]. Its ecological status is hailed as a rare water tower in the Pearl River Basin, as the area Domain development plays an important role, and the water resources contained in wetlands have an important battle for the regional landscape development A little meaning. Niangniangshan Wetland Park has played a great role in improving the local economy and environment since it was established as a national park in 2013. However, due to the epidemic and natural and man-made reasons, the development of the wetland park is currently hindered. Currently, the situation of Niangnianggangshan National Wetland Park is not optimistic. Further research and discussions by scholars are needed to explore methods for wetland restoration and protection, as well as the management and operation of the wetland park. It is hoped that more scholars can put forward better suggestions for the restoration and protection of plateau swamp wet scenic spots in the future literature. The restoration of wetlands can contribute to the well-being of people.

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