

## *Original Paper*

# Study on Pollution and Control of Rural Ecological Environment in the Three Gorges Reservoir Area—A Case Study of Xicun, Xintian Town, Wanzhou District, Chongqing

Zhangjian He<sup>1</sup>

<sup>1</sup> Major of Rural Development, School of Finance and Economics, Chongqing Three Gorges University  
Class of 2021, Wanzhou, Chongqing 404100, China

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### ***Abstract***

*Under the background of urbanization and rural revitalization, along with the continuous development of rural economy in the Three Gorges Reservoir area, a series of rural ecological environment also follows. Through the investigation of Xicheng Village of Xintian Town, we fully understand the current situation and problems of local rural ecology, and put forward various suggestions for these problems. Maintaining the ecological environment of Xishan village in Xintian Town can not only stimulate the development of local economy, but also affect the steady development of the green sustainable development road of the whole northeast Chongqing region. Xishan Village of Xintian Town should clearly establish the goal of “ecological economy demonstration of overall development of urban and rural areas”, adhere to the principle of “development on the point, protection on the surface”, take the road of green development, and realize the road to wealth of green mountains and green water on Jinshan and Yinshan as soon as possible. Based on the analysis and study of the current situation and problems of the environment in the west village of Xintian Town, Wanzhou District, Chongqing, the relevant countermeasures and suggestions are put forward to improve the rural ecological environment in the Three Gorges reservoir area.*

### ***Keywords***

*Three gorges reservoir area, Ecological environmental pollution, Xintian Town West village, Questions and Suggestions*

## 1. Introduction

The Three Gorges Reservoir area, located in the middle and lower reaches of the Yangtze River, is an administrative area affected by water level in the Three Gorges Project. The total area of the reservoir area is about  $5.90 \times 10^4$  km<sup>2</sup>, and the administrative scope is composed of 26 districts and counties, including 22 districts and counties administered by Chongqing Municipality and 4 districts and counties administered by Hubei Province. The total area of the Three Gorges Reservoir area (Chongqing Section) as the main body of the study is about 46 134.77 km<sup>2</sup>, accounting for 80.39% of the total area of the Three Gorges Reservoir area. The subtropical monsoon climate is the main climate type in the Three Gorges Reservoir area, and the annual precipitation in each area is almost the same, with the total amount between 1 000 and 1 800 mm. In the reservoir area, soil erosion is serious, and landslides, mud-rock flows, collapses and earthquakes often occur. With the construction of the Three Gorges Project, the reservoir area was impounding water, which changed the climatic environment of the reservoir area, expanded the water area, and reduced the temperature difference between day and night.

Xintian Town, belonging to Wanzhou District of Chongqing, is located in the middle of Wanzhou District, adjacent to Changling Town in the east, Zouma Town in the south, Xikou Township in the west, and Gao Feng Town across the river in the north. It is 21 kilometers away from the resident of Wanzhou District government, with a total area of 151.78 square kilometers. Xintian Town is located in the deep hills and shallow mountain zone, the terrain is high in the south and low in the north, and the terrain in the territory is dominated by low mountains and hills, accounting for 41.2% and 49.3% of the area under the jurisdiction, respectively. The highest peak is located in Wulong Lake, 1,092 meters above sea level; The lowest point is at Tri-State Creek, 175 m above sea level. Xintian Town is subtropical monsoon humid climate, its main natural disasters are hail, drought, waterlogging, wind disaster, lightning and so on. With the rapid development of urbanization and industrialization in Xintian Town, the problem of rural and agricultural pollution has become increasingly serious. It is not only necessary to attach great importance to the impact of rural ecological environment problems on rural agriculture, but also to actively take countermeasures to effectively curb the further deterioration of environmental problems, lead people to form green life and production methods, and promote economic development and green development. This is a safeguard measure to promote the sustainable development of agriculture in the west village of Xintian Town, build a beautiful rural home, and promote the happy life of farmers, and is also the top priority to ensure the ecological security of the Three Gorges Reservoir area.

This paper adopts the research method of organic combination of empirical and literature analysis, and takes a large number of existing statistical data and literature descriptions of actual cases as the main data sources. By combing the relevant literature of rural ecological environment governance at home and abroad, this paper summarizes the current academic understanding of rural ecological environment governance theory. Then take Xintian Town of Wanzhou District of Chongqing as an example to analyze the rural ecological environment pollution and governance, especially the problems existing in

environmental governance: insufficient publicity of environmental protection, weak grass-roots environmental protection forces, and less investment in enterprise governance to analyze the common problems existing in rural ecological environment governance in China. To find the cause of the problem and put forward targeted suggestions, from strengthening the publicity and education of environmental protection; Strengthen the basic strength of rural environmental protection; Optimize economic structure and diversify development; Establish a coordination mechanism for ecological and environmental governance; Enrich the governance subject, make efforts to improve the five aspects, and provide reasonable reference significance for effectively solving the problems in rural ecological environment governance and optimizing ecological environment governance.

## 2. Literature Review

Chinese scholars have done a lot of research on the values of ecological civilization. Yin Chengyong believes that ecological civilization is the subegiation and transcendence of industrial civilization, and the value of industrial civilization is a human-centered value and an economic value, while ecological civilization requires the formation of an overall value and ecological economic value of the system of “human and nature”, rather than the value of anthropocentrism. The other view, on the contrary, holds that both industrial civilization and ecological civilization are human-centered values. Because human beings advocate the construction of ecological civilization and protect the natural environment, in the end, it is also to protect themselves. There are two kinds of anthropocentrism, one is absolute anthropocentrism and the other is relative anthropocentrism. Industrial civilization takes absolute anthropocentrism as its value, while ecological civilization takes relative anthropocentrism as its value.

Huang Xianglian put forward that the construction of ecological civilization consciousness includes four aspects: ecological ethics consciousness, ecological environment concern consciousness and responsibility consciousness, ecological environment science and technology consciousness, ecological environment rule of law consciousness, and ecological civilization participation consciousness; Xiaoyao and Zhao Lei put forward the operation process of strengthening the construction of citizens’ awareness of ecological civilization, including three aspects: planning civic education, improving the evaluation system, and broadening participation channels. Han Xuefeng also pointed out that “vigorously cultivate the awareness of ecological civilization of the whole people”, and proposed implementation measures in several aspects such as civic education, legal constraints, and social practice. Most scholars believe that in order to promote the smooth development of ecological civilization, people should focus on the following aspects of efforts: the change of value concept, from the human-centered value to the harmonious coexistence of “man and nature” of the overall value and ecological economic value; The transformation of knowledge structure and the renewal of education mode, according to the requirement of “facing the future”, through the education of the whole society members’ ecological civilization concept, realize the cross-combination of social science and natural science; The change of urban development mode requires the urban construction according to the ecological principle, the inner

structure of the city is compatible with its function, and the city has a good ecological relationship with its external environment. The transformation of population production mode requires the global population growth to be under the rational control of human beings and the establishment of a population production mode that is compatible with resources and environment.

The core and essence of sustainable development theory is to ensure the harmony between human and nature while pursuing economic development. It is to pursue a new civilization -- ecological civilization on the basis of abolishing the traditional agricultural civilization and industrial civilization. This civilization requires the extension of human values and ultimate concern to the non-human nature and gives the ecological environment its due moral status. Chen Xueming pointed out that it is necessary to "combine the construction of ecological civilization with the creation of a new way of being." Hao Haiyan pointed out that communities play an irreplaceable basic role in promoting the construction of ecological civilization, which is reflected in the following aspects: promoting the popularization of knowledge and concepts of ecological civilization, advocating sustainable lifestyles and consumption patterns, building and motivating residents and society to participate in ecological civilization, and safeguarding residents' ecological and environmental rights and interests according to law.

From the above point of view, in theory, China has gradually formed a three-dimensional development model in the construction of ecological civilization with points and areas, promoting the whole with parts, and coordinating the development of all aspects, and ecological ethics, ecological economy, ecological system, ecological security, ecological environmental governance and ecological city construction, ecological rural construction, western ecological construction and other aspects go hand in hand and promote each other. However, there are still time lag and effect lag in practice and theory, the government still has many achievements in the construction of ecological civilization, the awareness of "ecological consciousness" of the public and enterprises still needs to be improved, and some ecological civilization systems are still floating on the surface. In the next step of ecological civilization construction research, we should focus on the implementation of ecological civilization construction and practical countermeasures to the current problems, in order to provide support for the "five in one" socialist construction. The importance of ecological civilization has been self-evident, what we have to do is to respond to the call of the Party and the government, and contribute our own strength to the construction and development of ecological civilization in our country.

### **3. The main problems of ecological environment in west village of Xintian Town**

Ecological progress has no end and is always on the way. The person in charge of Xintian Town takes the improvement of water quality in the whole area as the starting point to promote the ecological environment protection in the area to a new level. In addition, focusing on the improvement of village appearance, domestic waste management, rural toilet renovation, agricultural production waste resource utilization, etc., the overall promotion of rural living environment improvement, focusing on the "five Qing" (garbage, ditches, courtyards, ruins, and illegal buildings), the implementation of the

“five reforms” (toilet, kitchen, circle, road, courtyard), Control litter, firewood, sewage, disorderly discharge, housing construction, so that the people in the area to build and share a beautiful countryside, livable homes. However, at present, there are still some problems in the ecological environment of the west village of Xintian Town.

### *3.1 The Intensification of Rural Living Pollution*

With the rapid construction of new rural areas, the number of new rural areas has also increased, resulting in farmers from scattered to concentrated living, whether it is the use of water resources, electricity use degree and living kitchen waste have caused a huge burden on the ecological environment. At present, many administrative villages do not have a complete garbage collection and transportation system, the government invests little funds in environmental protection facilities, and the garbage recycling facilities are not complete. As a result, most residents dump their garbage at will in the river or conventional garbage dumps, and some even burn it directly or landfill it, causing secondary pollution to the environment. In addition, when Qingshui Township and Dayang Township in the west village of Xintian Town come to the summer peak season, a large number of urban residents move to the summer resort area, which causes traffic congestion, noise pollution and a large amount of domestic garbage in the countryside for a long time, and seriously threatens the water resources and air quality of the entire township area.

### *3.2 Agricultural Surface Pollution and Township Industrial Enterprises Pollution is Serious*

In recent years, the extensive use of pesticides, fertilizers and agricultural film is the direct cause of rural land pollution. Because each township government vigorously called on farmers retail management to “one village, one product” transformation, and vigorously develop the regular model industry. The large-scale use of pesticides and fertilizers in these so-called “characteristic villages” has caused the imbalance of nitrogen, phosphorus and potassium in the land, seriously damaging the soil structure, causing land compaction and reducing land productivity. Rice needs to be covered with a large amount of mulch in the early stage of cultivation. Due to the lack of farmers’ awareness of environmental protection, more than 75% of agricultural film and medicine bottles are not recycled after use and remain in the land. In the past few decades, in order to actively respond to the national call for rapid economic development, under the strong desire to lead farmers to quickly become rich and lead a well-off life, the local government encouraged industrial development, not only introduced urban industrial enterprises to take root in the countryside, but also many farmers established factories on their own. Most of the township industrial enterprises have low technical level and poor management level. There was also no complete industrial sewerage system, which discharged waste water directly into the fields and discharged exhaust gases on a large scale. For example, the mining plant and small paper mill in Jiangkou Town, and the industrial park in Renhe Town, etc., the wastewater and exhaust gas discharged by these industrial enterprises pose a great threat to the ecological environment.

### *3.3 The Sewage Disposal Methods of Livestock and Poultry in Rural Areas are Improper*

In order to increase family income, China implements the production and management mode based on

household contract management. Most of the pig, chicken, duck and other farms are set up by farmers and families, and some are set up by urban enterprises in rural areas. Although they promote economic development and improve the degree of intensive farming in rural areas to a certain extent, the vast majority of family farms have no sewage treatment measures, and almost all the excrement from livestock and poultry farming is directly discharged into the agricultural land. The microorganisms discharged from waste manure in livestock breeding will not only have a serious impact on the cultivated agricultural products and soil structure, but also cause the deterioration of water quality when the manure penetrates into groundwater, and even cause indirect harm to human health.

#### **4. Countermeasures and Suggestions to Solve Rural Ecological Environment Pollution in Three Gorges Reservoir Area**

##### *4.1 Increase Investment in Rural Ecological Environment Management Funds and Environmental Protection Planning*

The relevant departments should increase the management of the rural ecological environment, rationally plan the industrial layout and establish a centralized waste treatment system. In terms of policies, relevant departments should introduce relevant policies and measures to restrict the behavior of enterprises and individuals in polluting the environment, and formulate measures with rewards and punishments. In terms of funds, the government should increase investment in public facilities, rationally allocate garbage cans and garbage carriers according to the environmental area, and centrally and uniformly recycle garbage for disposal. In addition, the use of clean energy such as natural gas or biogas should be advocated to reduce the pollution of the atmospheric environment. Strict supervision of farmers and enterprises must not directly into the river or soil to pollute groundwater and surface water, should use science and technology to establish a set of drainage system. Each village neighborhood committee should formulate detailed rules to appeal to villagers to care for the environment. Farmers should voluntarily clean up the surrounding areas of their courtyards and highways, and select “clean households” according to the degree of cleanliness, so as to enhance villagers’ enthusiasm for caring for the environment.

##### *4.2 Strengthen Control over the Use of Pesticides and Agricultural Film*

Government departments should increase their support for new pesticide creation projects, actively develop new pesticides, low-toxicity and high-efficiency pesticides, promote the replacement of pesticide products, and start pilot programs for subsidizing the use of low-degree and low-residue pesticides and high-efficiency slow-release fertilizers. Farmers themselves should respond to the call to protect the environment, take the initiative to reduce the use of high-toxic and high-residue pesticides, and take the initiative to take away the empty bottles after the use of pesticides, and do not throw them away at will. Third, farmers should use agricultural film correctly and delay the life of agricultural film to achieve secondary utilization. If it can not be used twice, pay attention to recycling, can not be thrown away in the river or farmland, adhere to the principle of “how much to use, how much to

recycle” to prevent it from remaining in the land and polluting the land. Farmers can also use biodegradable biofilms, so that even if left in the land, it will not leave white pollution on the land.

#### *4.3 Implement the Assessment System for Grass-roots Unit Personnel and Strengthen the Education of Farmers' Environmental Awareness*

First of all, we should strengthen the education of grassroots units and personnel on environmental protection knowledge, especially the environmental protection work included in the performance assessment of Party members, to publish the audit results and evaluation levels, so that party members can form internal supervision and give full play to the mass base and mass influence of party members, so as to “protect the environment”, The mobilization work of “everyone is responsible” has been implemented. Then, the staff of grass-roots units are mobilized to carry out the model of “precise publicity and education for one village and one household”, and regularly target villagers to convey the importance and necessity of environmental protection to residents through popular and understandable means such as multimedia display or artistic performance. In addition, it can also regularly investigate the villagers' satisfaction with the rural ecological environment, and accurately solve environmental problems through the feedback of villagers.

### **5. Conclusion**

With the continuous development of social economy, ecological environment problems have become increasingly serious, and the rural ecological environment pollution is more prominent, which seriously hinders the development of rural economy and is not conducive to the advancement of the new rural construction. How to solve the rural ecological environment problems has become an urgent problem to be solved in the current process of rural development. In the face of the current rural ecological environment problems in the Three Gorges Reservoir area, the municipal Party Committee and the municipal government, taking the spirit of the Party Central Committee as the guiding ideology, have successively implemented a series of major projects and action plans for environmental protection, continuous improvement of the rural environment, and water pollution prevention and control planning in the Three Gorges Reservoir area, and have achieved great results in improving the rural ecological environment. Through the investigation of Xicheng Village of Xintian Town, we fully understand the current situation and problems of local rural ecology, and put forward various suggestions in view of these problems. Maintaining the ecological environment of Xishan Village in Xintian Town can not only stimulate the development of local economy, but also affect the steady development of the green and sustainable development road of rural and agricultural development in the whole Three Gorges Reservoir area. Xishan Village of Xintian Town should clearly establish the goal of “ecological economy demonstration county with overall development of urban and rural areas”, adhere to the principle of “development on the point, protection on the surface”, take the road of green development, and realize the road of wealth on Jinshan and Yinshan as soon as possible. Strengthening the protection and construction of the rural ecological environment is of great significance for promoting the

construction of the new socialist countryside, and is a necessary measure to achieve the stable and efficient development of the rural economy, which needs to be paid enough attention to. Under the correct leadership of the municipal Party committee and the municipal government, through the active participation of the governments at all levels and the people of the whole city, the rural environment in the Three Gorges Reservoir area has been greatly improved, but there are still some problems, so we must unswervingly continue to strengthen the protection and construction of the rural ecological environment in the Three Gorges Reservoir area.

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