

Evaluation of Legal Regulation Countermeasures for Rural Water Environment Pollution Based on Environmental Sustainability

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Abstract: At the beginning of the 21st century, under the trend of increasing global environmental protection calls, countries have gradually paid more attention to environmental protection and sustainable resource utilization. Moreover, due to the increasing demand for their own health, the public also has a high demand for the government's environmental protection work. However, what is not commensurate with the accelerating pace of urban environmental protection is that the vast rural and remote areas are still self-sufficient. Under their original cognitive mode of thinking, they "go their own way" and throw laws and regulations out of the sky in the face of huge economic benefits, making the laws promulgated by the state a piece of shit for lawbreakers. Therefore, starting from the improvement of rural water environment, this paper firstly clarified the source, harm and necessity of treatment of rural water environment pollution; secondly, it used the comparative analysis method to analyze the legal problems existing in the prevention and control of rural water environment pollution; finally, through the interdisciplinary analysis method, the legal countermeasures for the prevention and control of rural water environment pollution were perfected. The experimental results showed that the improved legal practice of rural water environment pollution control can effectively improve the 19.23% recognition of rural residents and promote the development of rural water environment pollution control.

1. Introduction

This paper systematically studies the legal regulation and countermeasures of rural water environment pollution under the background of environmental sustainability. The improvement of

the legal governance level of the rural water environment is conducive to the sustainable development of the rural environment. The following are related studies on rural water governance countermeasures and environmental sustainable development.

There are some studies on the countermeasures of rural water governance by scholars. Feng Q's research pointed out that the history of civilization development is a history in which human beings constantly adapt to changes in the water environment and achieve water environment safety. His research analyzed the water environment security problems and countermeasures that have existed in the history of Dianchi Lake Basin, and analyzed the current threats to water environment security [1]. The current situation of groundwater resources development and utilization in a village in Cai Q was analyzed and studied. In addition, from the perspectives of laws and regulations management, system construction, water administrative mechanism construction and industrial technical means, targeted groundwater resources development and utilization and comprehensive protection countermeasures were put forward, so as to better promote the water resources management in the region [2]. Shipeng S constructed a theoretical framework of public participation in rural water environment governance. This case draws the conclusion that personal environmental protection awareness, environmental protection facilities conditions and environmental service quality have a significant impact on public participation in the protection of rural water environment [3]. Chao Y E believed that the arrival of the mobile society has profoundly changed the traditional rural pattern, calling for new rural water governance strategies [4]. Naiga R's survey showed that despite more than a decade of Uganda's demand-driven approach to rural water supply, the operation and maintenance of public water infrastructure remains a difficult task. The mixed methods and socio-ecological frameworks further propose factors influencing water user satisfaction under a demand-driven water governance model. Results showed a highly significant relationship between user satisfaction and willingness to contribute to the operation and maintenance of water infrastructure [5]. The above researches on rural water governance countermeasures were analyzed. Environmental sustainability has been studied by many scholars. Kaklauskas A discussed the achievements and trends related to environmental sustainability in the 15 republics within the Union of Soviet Socialist Republics over the past decades - the ecological footprint, the environmental performance index and the quality of life index [6]. Engez A believed that environmental sustainability is increasingly important in human existence, and the purpose of the study is to investigate four regions in Tampere, Finland, through an ecosystem approach perspective. The study concluded that a sustainable development-oriented circular economy ecosystem can help improve the quality of human life [7]. Research by Daliolu S T pointed out that universities play a leading role in promoting sustainable social development. Therefore, the carbon emissions of universities need to be managed and reduced to ensure environmental sustainability [8]. Sugandi D found that most traditional villages have the wisdom of environmental utilization, and the research aims to analyze the adaptation forms of agricultural patterns and rural life patterns, so as to obtain strategies for sustainable development of the environment [9]. Research by Alola A A found that with the growing push for a clean environment, lower risk investment and financing opportunities remain a relevant barrier to achieving a paradigm shift from old methods and thinking to responsible climate action and environmental awareness [10]. The above scholars have made fruitful progress in the research of environmental sustainable development.

This paper formulated relevant legal countermeasures for rural water environment pollution. Through the research, it is expected to contribute to the rural revitalization strategy and to the goal of sustainable environmental development, so as to achieve the effect that rural economic development and environmental protection complement each other and promote each other.

2. Source, Harm and Necessity of Treatment of Rural Water Environment Pollution

(1) Sources of rural water environment pollution

The reason why the rural water environment has become the foundation of a country and a nation is that the water environment is not only the basis for farming and cultivating the food needed for human survival, but also plays the role of atmospheric circulation, regulating ecosystems and stabilizing the natural environment [11]. In order to conduct an in-depth analysis of the legislation on the prevention and control of rural water environment pollution, the source of rural water environment pollution should be identified first. The sources of rural water environment pollution are shown in Figure 1:

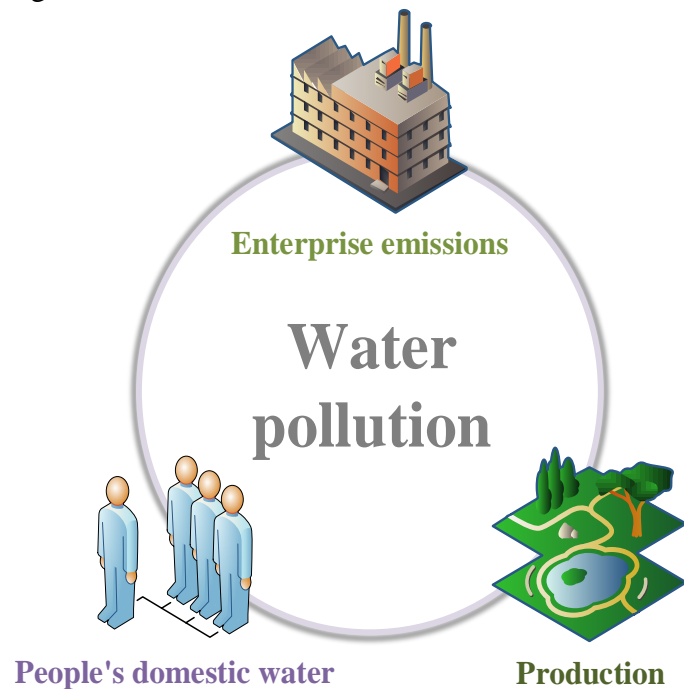


Figure 1: The source of rural water environment pollution

As shown in Figure 1, the sources of rural water environment pollution are mainly three levels: people's domestic water, enterprise discharge, and production.

People's domestic water level: the vast rural areas do not have corresponding sewage treatment facilities to recycle water resources, and most rural communities with sewage treatment systems do not properly maintain the system, resulting in residential sewage being directly discharged into lakes and rivers. In addition, due to the improper disposal of the daily garbage of the rural population, most of the garbage is not covered or handled properly, and some are even directly poured into the tap water source. In a rural area with a large population, if the situation develops according to this trend, the pollution caused may be unimaginable.

Enterprise emission level: township and village enterprises usually face problems such as limited scale, scattered structure, and serious pollution, and many business owners also show weak legal knowledge and contempt for environmental pollution [12]. These areas do not have adequate sewage infrastructure and sewage treatment plants, which may lead to further environmental pollution in rural areas. At the same time, the government has implemented a "tele-relocation" policy on heavily polluting businesses in major metropolitan areas, such as the electronics industry, shipyards and chemical plants, limiting their ability to congregate to outer suburbs or villages. This puts further pressure on the environment.

Production level: airborne pesticides are carried to the ground by rain, where they interact with other pollutants and degrade soil and water flow, and move up the food chain. Humans are at the top of the food chain and are obviously hurt by where they are; at present, the main form of rural aquaculture is large-scale aquaculture, which causes great pressure on the environment. According to relevant data, the wastewater produced by pig farming is 7 times that of cattle and 22 times that of humans [13].

(2) Harm of rural water environment pollution

Rural water environment pollution would directly or indirectly cause harm to the health of residents, and further lead to social contradictions and aggravate social disharmony factors. The harm of rural water environment pollution is shown in Figure 2:

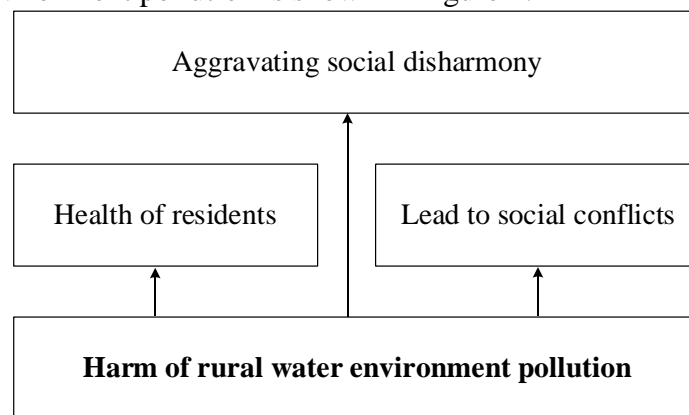


Figure 2: Harm of rural water environment pollution

Harm to the health of residents: many people living in rural areas are not adequately guaranteed their daily water safety, which not only harms them long-term, but also affects the development of their offspring. In addition, water from reservoirs and rivers is consumed by residents every day, and most of the high levels of heavy metals and pesticide residues are the two main derivatives of water pollution that may directly enter the human body. Such pollutants can rapidly cause disease in humans, including acute pharyngitis, bronchial asthma, pneumonia, and other respiratory inflammatory conditions [14].

Social contradictions: on the one hand, local residents are prone to disputes with companies that cause pollution. Most companies that choose and operate in rural areas are forcibly relocated from the city by the government; on the other hand, many villages share the same river, and the area is not clearly defined. Some people arbitrarily discharge domestic sewage into the upstream, and it may be washed with the water flow, so that the upstream water quality is not polluted. However, the downstream villages are suffering and often lead to civil disputes. In some places, there are numerous cases of dead fish in large areas in fish ponds and cases of diseases caused by unclean water for livestock in farms. It seriously affects social security and stability, and also causes a lot of social conflicts.

Factors that exacerbate social disharmony: unbalanced development between urban and rural areas would exacerbate the spread of urban pollution sources in rural areas. In order to avoid inspections and save money, many heavily polluting and high-cost enterprises have settled in the countryside one after another, consuming a lot of green mountains and green water. Pollutants are also arbitrarily disposed of in rural areas. Many poverty-stricken areas only know about attracting investment, but do not know the environmental costs behind them. In the short term, the pockets of farmers have swelled, and many villages have taken off the hat of poverty. However, the green mountains and green waters no longer exist. If things go on like this, one would disappear and another would rise, intensifying social disharmony.

3. Legal Issues in the Prevention and Control of Rural Water Environment Pollution

This research mainly adopts the following two methods. Comparative analysis method: based on the collection of relevant data on water environment pollution control legislation, this paper compares and analyzes the top-level design and specific legislation in various places and summarizes some problems in the legislation, and puts forward feasible balance suggestions for these problems to ensure the healthy development of the water environment; interdisciplinary analysis: water environment pollution control is not only the hot spot of legal research, but also the focus of economics and political science research. Therefore, in improving the legal countermeasures for the prevention and control of rural water environment pollution, interdisciplinary theory is involved. At present, there are three main problems in water environment pollution control, as shown in Figure 3:

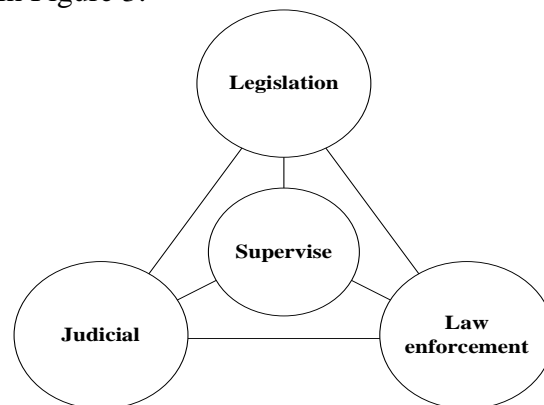


Figure 3: Problems in water environment pollution control

(1) The concept of water environment legislation

With the progress of society and the establishment and development of ecological civilization, the country has made considerable and effective progress in the control and prevention of environmental pollution [15]. However, there are still structural problems of environmental legislation. In the central urban area of urban integration, it is easy to achieve unified coordination and unified deployment. However, in rural areas, especially in remote mountainous areas, it is difficult to coordinate and deploy scattered areas as required to formulate relevant standards.

(2) Weak judicial level of rural water environment pollution

At present, most of the water pollution cases in rural areas are handled by grassroots courts. In recent years, the issue of water environment and resource protection has attracted great attention from the state, which has led to the frequent occurrence and increase of the number of environmental disputes that were not too many, and caused great pressure on the trial work of the grassroots courts [16]. Most of the relevant judicial workers in the grassroots courts do not have the theoretical work experience of environmental protection, and they are a little caught off guard when faced with complex environmental cases. Moreover, the common feature of such cases is that they need to use professional knowledge to collect evidence on the spot. Often due to lack of experience, some judicial workers rely too much on their own subjective judgments and lack objective and strong scientific arguments. Moreover, throughout the legal discipline, the number of environmental protection legal talents is relatively small compared with other fields, resulting in insufficient supply of professional judicial workers, and cannot inject fresh blood into judicial environmental protection work.

When the grassroots have insufficient theoretical and practical experience, they often rely on individual subjective judgments and lack precise scientific basis and analysis and demonstration. In

addition, the finance of the judicial system in rural areas is controlled by the local government, and the government often intervenes during the judicial trial, which makes it impossible for the environmental judicial department to make an objective judgment.

(3) Water environment law enforcement issues

Rural administrative units are small in scale, but huge in number, and the problems of water environment law enforcement cannot be ignored [17]. There are quite a lot of rural areas without environmental law enforcement agencies to monitor and control the environment in real time. Managers are completely unaware of illegal acts that damage ecological resources. Often, higher-level units set rigid targets or force governance, which is just a symbolic governance after awareness.

Due to the lack of superior supervision and administrative accountability, the quality of administrative law enforcement personnel in some rural areas is not high, and they are not aware of the importance of the ecological environment and cannot strictly enforce the law according to the system. In the face of complex rural geography, law enforcement officers need to have rich professional knowledge and the ability to deal with sudden situations. Some funds are used for economic development, and some are used to fill fiscal deficits. Even if some funds reach the vast rural areas, there are still many difficulties in implementing them. At the same time, the treatment of administrative law enforcement personnel is lower than that of cities, which greatly frustrates the enthusiasm of the staff and hinders the law enforcement against water pollution.

(4) Difficulties in public interest litigation

The number of social organizations participating in environmental public interest litigation is small, which undoubtedly dampens the enthusiasm for environmental public interest litigation [18]. Because the law requires that social organizations cannot seek economic benefits by means of litigation, and it is difficult to obtain evidence in environmental litigation, the arguments are complicated and the trial period is long, resulting in high environmental litigation costs. The reason for this embarrassment is that in addition to the huge amount of litigation costs such as prosecution, preliminary inspection, appraisal fees, and attorney fees, it also exposes the shortcomings of the organization itself. Internal members lack experience and environmental protection knowledge in environmental litigation, resulting in more than enough effort to deal with complex water pollution cases, and making many legal professionals reluctant to join the team of environmental public interest litigation.

4. Improvement of Legal Countermeasures for the Prevention and Control of Rural Water Environment Pollution

(1) Establishment of the legislative concept of water environment governance

Legislators must first consider legislation and build advanced concepts from the perspective of promoting ecological civilization and sustainable development. Old ideas and concepts must be discarded, and concepts with economic construction as the core and industry as the goal regardless of the environment must be replaced. When legislation, companies are forced to transform themselves or improve their own energy-saving standards, and the focus of environmental legislation is shifted to encouraging and supporting companies that are good at small polluting projects. Legislation should stipulate that companies that generate a lot of pollution and use a lot of energy must meet higher pollutant emission start-up standards and pay higher fines, and be forced to change or improve their own energy-saving standards on their own. The focus of environmental legislation would shift to helping less polluting businesses, and businesses with valuable initiatives would receive legal defense and policy help. Short-sighted economic behavior at the expense of environmental quality is resolutely stopped. The legislative structure is shown in Figure 4:

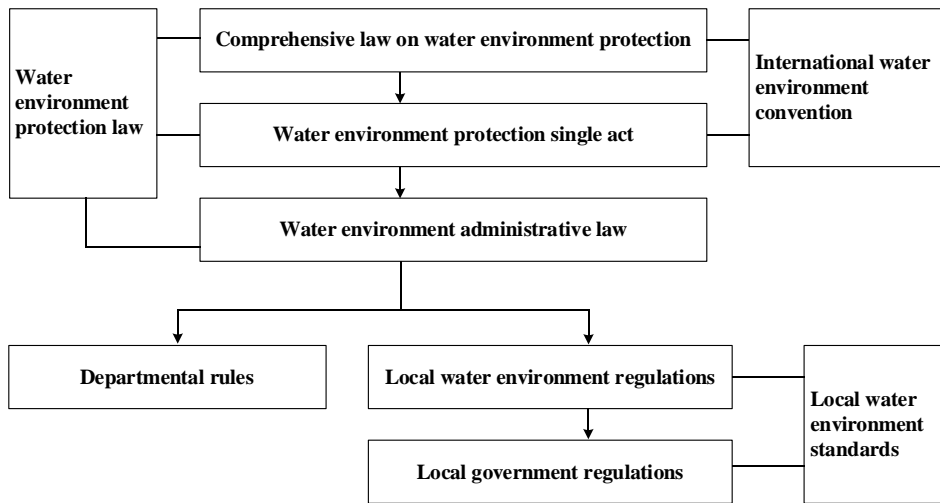


Figure 4: Legislative framework

As a more targeted law on water pollution, the current situation of the vast grass-roots areas should be considered according to local conditions. If the power is delegated to the direct jurisdiction of the township government, many grassroots environmental protection infringement cases can be immediately discovered and dealt with without having to report to each other. In addition, there are very few regulations on farming and animal husbandry in rural areas, and the general statement cannot put the pollution prevention and control of the main industries in the countryside into operability and make regulations. These are the reflections that the environmental legislation attaches great importance to the city while neglecting the countryside.

(2) Strengthening of the law enforcement of water environment management

When establishing the necessary law enforcement agencies, care should also be taken to maintain their authority. Many grass-roots departments are directly governed and supervised by the government at the same level, which makes it impossible to objectively characterize illegal acts in accordance with the law in the law enforcement process. The proposal and initiation of many polluting projects are not unrelated to local governments, which are caused by the government's unwise promotion of economic development in order to rapidly expand economic achievements. This presents great difficulties for local law enforcement agencies [19]. Therefore, streamlining administration and delegating power enables grass-roots environmental law enforcement departments to enjoy greater and more power, so as to enforce the law fairly and objectively.

It is imperative to improve the level of rural water pollution law enforcement officers and establish a long-term and effective training mechanism for the professional quality of law enforcement officers. In the face of certain specific cases, grass-roots law enforcement staff should be flexible in handling and adapt to specific situations, and make accurate judgments in law enforcement, so as not to allow criminals to take advantage.

Grass-roots areas should promote environmental protection law enforcement personnel to compete for posts to promote the enthusiasm of law enforcement personnel to acquire new environmental protection knowledge, and establish a long-term subsidy mechanism to provide appropriate subsidies for law enforcement personnel in remote areas. The staff in the adjacent areas are organized to continue their studies, in-depth analysis, interpretation and research on difficult problems and classic cases in law enforcement. At the same time, the system of exchange and changing of posts for environmental protection staff in different places can be implemented on a trial basis to improve the professional quality of law enforcement personnel and achieve fair law enforcement.

(3) Perfection of judicial guarantee for water environment governance

The establishment of special environmental protection courts in grass-roots courts in rural areas is a significant move with far-reaching and extensive significance, and it has a good target for the handling of grass-roots environmental litigation cases. Water pollution is different from other cases in that it has extremely high requirements for judicial professionalism, and emphasizes objective data analysis and scientific basis [20]. The work pressure of the grass-roots courts is already high, and the types of litigation business handled are complex and large. Many grassroots judicial workers are still a little overwhelmed with ordinary litigation cases in person. What's more, pollution cases still need to go through a variety of complex systematic scientific demonstrations. The establishment of environmental courts can train judges to hear and try environmental litigation cases in a planned way, and cultivate a group of judges who specialize in handling such cases, which would facilitate the diversity of judicial types, the complementarity of judicial power and the professionalization of the judicial system.

5. Experiment on Legal Recognition of Rural Water Environment

First, the sample set is set up. This paper invites 200 villagers from 20 natural villages as experimental subjects, and 10 villagers from each natural village participate in the test. It would introduce the details of the improved legal policy in detail. Through the questionnaire, the pre-improvement rural water environment legal regulation and the post-improvement rural water environment legal regulation are evaluated. The improved rural water environment legal regulation is named T1, and the pre-improved rural water environmental legal regulation is named T2. The information of the villagers is shown in Table 1:

Table 1: Villager's information

Village name	Number of people	Number of man	Number of women
A village	10	6	4
B village	10	7	3
C village	10	5	5
D village	10	6	4
E village	10	8	2
F village	10	5	5
G village	10	8	2
H village	10	6	4
I village	10	6	4
J village	10	8	2
K village	10	5	5
L village	10	6	4
M village	10	6	4
N village	10	6	4
O village	10	8	2
P village	10	5	5
Q village	10	8	2
R village	10	7	3
S village	10	5	5
T village	10	7	3

(1) Evaluation of the legislative concept of water environment pollution

Legislation is generally a code of conduct formulated or recognized by a specific state agency in accordance with certain procedures, which reflects the motivation of the ruling class and is guaranteed and enforced by the coercive force of the state. Legislation has the following functions: it is the necessary way and means for the formation and expression of the motivation of the state; the class in charge of state power must use legislative means to confirm the social relations and social order in its favor; legislators use legislative means to coordinate social relations and resolve social contradictions; legislation is the premise of the development of democratic institutionalization and legalization; legislation is also a basic activity in the rule of law and the construction of a country under the rule of law. The evaluation of the legislative concept of water environmental pollution is shown in Figure 5:

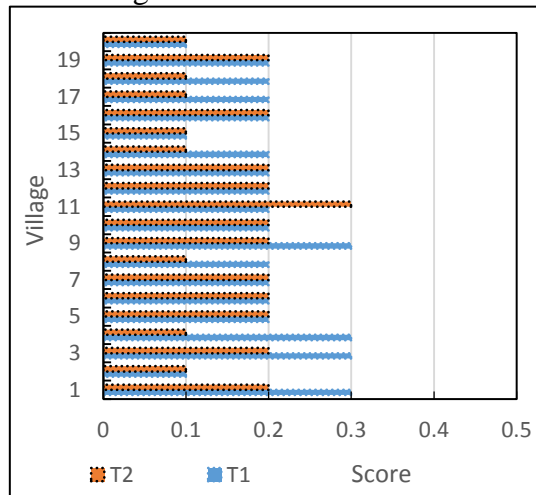


Figure 5: Evaluation of the legislative concept of water environment pollution

Figure 5 shows that the villagers recognize the improved rural water environment pollution legislation concept in this paper. Compared with the rural water environment pollution legislation before the improvement, the two scores are higher at the span level and the highest score level of the vertical axis. The perfection of the legislative concept is conducive to the consolidation of the law enforcement foundation of the rural water environment.

(2) Evaluation of judicial concepts of water environment pollution

The judiciary is also called "the application of the law", and its main characteristics are as follows. Judicial passivity is strong. The executive power operates actively, while the judicial power is passive. During the operation of the administrative power, it has always been actively involved in the social activities and individual lives of the people. Executive power is delegated. However, judicial power is exclusive and no delegation is allowed, unless the plaintiff and the prosecution raise issues for adjudication to other bodies, such as the arbitration body. The evaluation of judicial concept of water environment pollution is shown in Figure 6.

Figure 6 shows that the villagers have a high degree of recognition of the judicial concept of rural water environment pollution after this article has been improved. From the scores, it can be seen that after the villagers have a detailed understanding of the concept of justice, they attach great importance to the concept of justice. Legislation and judiciary are closely related in the legal adjustment mechanism.

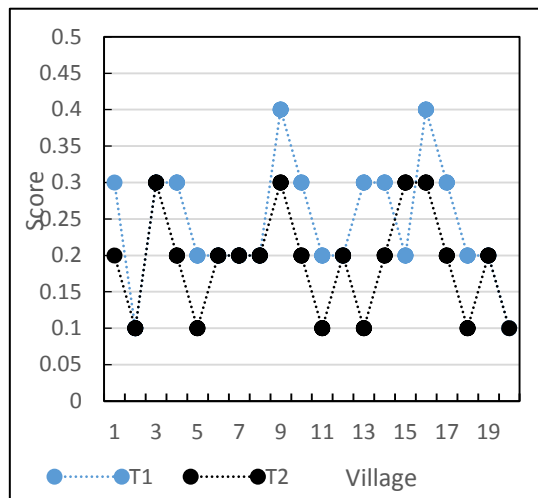


Figure 6: Evaluation of judicial concept of water environment pollution

(3) Evaluation of the concept of water environment pollution law enforcement

As an important part of water environmental protection work, law enforcement is an effective means to ensure economic and environmental health and sustainable development. Environmental supervision departments at all levels, as the main body of environmental protection law enforcement, have extremely important responsibilities in water environment law enforcement. The concept evaluation of water environment pollution law enforcement is shown in Figure 7:

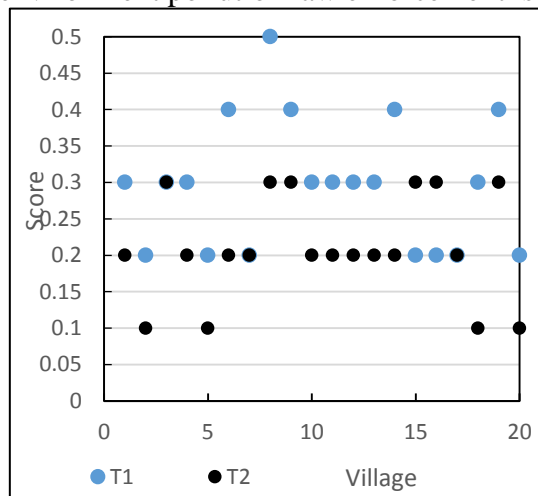


Figure 7: Evaluation of law enforcement concept for water environment pollution

Figure 7 shows that the villagers highly recognize the improved law enforcement concept of rural water environment pollution in this paper. It can be seen from the scores that the villagers are very concerned about the concept of law enforcement. Law enforcement is the main manifestation of the implementation of water environment pollution control. In accordance with the law, the responsibilities of relevant departments should be in place, and problems arising in the process of law enforcement should be studied and solved in a timely manner.

(4) Comprehensive recognition of villagers

The comprehensive mean value of the three results obtained in the above experiments was calculated to obtain the comprehensive acceptance of the villagers. The comparison results are shown in Figure 8:

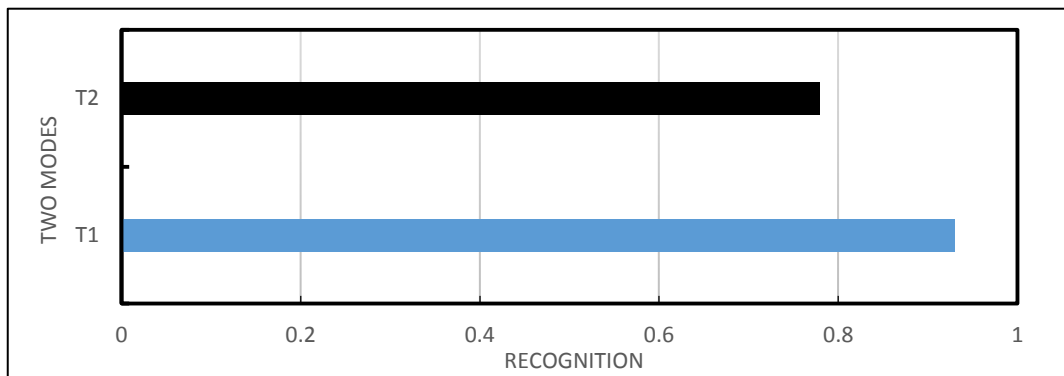


Figure 8: Villagers' comprehensive recognition

It can be seen from Figure 8 that the villagers' recognition of the rural water environment pollution legal regulation after the improvement of this paper is higher than that before the improvement, and the recognition degree of the villagers has increased by about 19.23%. Solving the problem of rural water environment pollution is not only responsible for the health of the majority of rural residents, but also indirectly improves the quality of life of the urban population, and affects the industrial layout and economic structure from the side toward a better and more environmentally friendly direction.

6. Conclusions

The construction of a clean rural water environment resource system needs to make great efforts in the legal aspect. The advanced rural water environment legislation concept has been established and the rural water environmental protection legal system has been improved, and a supporting system with strong operability has been formulated, so as to improve the environmental protection law enforcement and judicial institutions, and improve the capabilities of relevant personnel. Based on the background of environmental sustainability, this paper analyzed the legal regulation countermeasures of rural water environment pollution. The experiment obtained the evaluation results of water environment pollution legislation concept, water environment pollution judicial concept evaluation results, water environment pollution law enforcement concept evaluation results and villagers' comprehensive recognition results. The experimental results showed that the improved legal practice of rural water environment pollution control can effectively improve the recognition of rural residents. The side confirmed the feasibility and good expected effect of its legal regulation, which is beneficial to the treatment of rural water environment pollution.

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Data Availability

The datasets used during the current study are available from the corresponding author on reasonable request.

Conflict of Interest

The author states that this article has no conflict of interest.

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