Discussion on the Evaluation Index System of Rural Water Environment

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Abstract. To construct rural water environment index evaluation system in a reasonable way is not only of great significance to the correct understanding of rural water environment, but also plays an important role in predicting the future development trend of rural water resources. Based on the current situation of rural water environment, This paper attempts to explore the principles of setting up the evaluation system of rural water resources and environment, and to build the evaluation system of rural water resources and environment. Finally, this paper constructs a multilevel evaluation system of water resources and environment, which aims to protect the water resources and environment, including three kinds of elements and eight indexes of water supply safety, drainage safety and objective factors, which can be used for rural water resources and environment.

1. Introduction
Rural water environment is the water environment for the village where the villagers live and the surrounding areas are closely related to the residents' life and living. It mainly includes the reservoir, river, pond, drinking water of the villagers around the village, which are closely related to the villagers' life and some crops. According to the previous studies and combination with the actual situation of rural areas in China, this study puts forward some principles and evaluation systems to optimize the rural water resources and environment evaluation system, to provide a reasonable reference for optimizing the rural water resources and environment to the greatest extent, in order to improve the quality of the whole social water environment.

2. Basic Principles
The construction of evaluation index system mainly includes two parts: index selection and system construction. In order to construct the evaluation system of rural water environment efficiently and reasonably, the following rules must be followed:

2.1. Combination of science and operation
Only by constructing a scientific evaluation system, can it have reference significance and lay a solid foundation for subsequent operation. In addition, it is necessary to strengthen the practical operation of the evaluation system on the basis of science.
2.2. Combination of comprehensiveness and representativeness
Comprehensiveness means that all aspects related to water environment should be fully considered in the construction of water environment evaluation system, such as the perfection degree of infrastructure for rural water supply and drainage, as well as the cost of infrastructure construction [1]. In addition, we should integrate the typical representatives of water resources reasonably. Only in this way, we can enhance the typicality and representativeness of the evaluation system to enhance the efficiency of the evaluation system.

2.3. Combination of adaptation to local conditions and universality.
Due to the influence of natural environment, human environment and other factors, there will be different degrees of water resources environment in different regions. At this time, it is necessary to determine the water resources evaluation indicators suitable for different regions according to the terrain, temperature and other factors, so as to improve the efficiency of the evaluation system. At the same time, it is necessary to pay attention to the commonness of water resources evaluation indicators in different regions, so as to reduce the cost of formulating evaluation indicators.

3. Basis for selecting evaluation indexes
3.1. Water supply safety index
3.1.1. Daily per capita water consumption. To ensure the basic quality of drinking water for residents, the most basic thing is to ensure that residents have water to drink and use. Because the use of drinking water and domestic water reflects the water supply capacity of a region, and is relatively to the local living standards. In this way, we can infer the degree of development of water supply facilities in an area, at the same time, based on the local natural geographical conditions, the utilization of water resources of residents in an area can be judged, and then infer the water supply.

3.1.2. Use of water supply. In order to use water resources efficiently, we must bring the end use of water resources into the water resources evaluation system. In addition, the investigation of the end use of water resources can provide a reasonable basis for the selection of water supply mode. Especially in some remote mountainous areas, we can meet the water demand of more residents as much as possible and improve the utilization efficiency of water resources.

3.1.3. Water quality. At present, the main problems in rural areas are that the water quality is not up to the standard, including the high alkaline, heavy metals, and the lack minerals, having a bad effect on the residents. In the process of establishing the evaluation system of rural residents' water resources, we should ensure that residents have water to drink and use firstly, more importantly, we should ensure the quality of water resources, making the water which the residents can drink healthy.

3.1.4. Water supply mode. Based on the user's living geographical environment, infrastructure and other factors, the water supply can be divided into tap water, centralized fixed-point water supply and single household decentralized water supply [2]. According to the continuity of time, the water supply mode can be divided into two kinds: continuous water supply and intermittent water supply, which can meet the needs of different customers. Therefore, different ways of water supply play an important role in improving the quality of water environment of residents.

3.2. Drainage safety index
3.2.1. Precipitation discharge. Due to the backward drainage facilities in rural areas of our country, it is easy to block and deposit the drainage channels, especially in some villages with more dirt roads. Even if there is some light rain, the road will be muddy. Once the rainfall increase slightly, and the
houses will be flooded [3]. Therefore, we can enhance the utilization of water resources by utilizing natural precipitation.

3.2.2. Domestic drainage treatment. As the drainage facilities are relatively backward in rural areas, the kitchen, sewage and washing water will have a serious impact on the environment. The increase of pollutant concentration in the most important drainage will directly bring serious harm to the living water environment and drinking water of rural residents [4]. In addition, once encountering heavy rainfall, these waste water will enter into the rivers near the rural residents with some waste garbage, which will directly lead to river pollution and lake eutrophication. Therefore, the domestic sewage must be treated as one of the important factors of the rural water environment evaluation system, which is important to improve the rural residential water environment.

3.3. Objective factor index

3.3.1. Natural conditions. Because of the difference of topography, climate, rainfall and so on, there will be different degrees of water resources. The infrastructure of water resources treatment in these two areas will be different in different degrees, and we will adopt different water supply methods according to different terrain. Therefore, in the development of water resources evaluation index system, we should adapt to local conditions, according to the different geographical environment and adopt a different index evaluation system, to maximize the accuracy.

3.3.2. Economic level. Because of the differences in economic conditions in different regions, the demand for water resources treatment in different regions is also different. For example, in the developed economy, the requirements for water resources treatment facilities are relatively high [5], while in the remote areas, due to the underdeveloped economy, the requirements for water resources and environment are relatively low. Therefore, when formulating the water resources and environment evaluation index system, it is necessary to formulate a reasonable evaluation index system according to the differences of different economic levels.

4. Conclusion
According to the above basic principles and evaluation indexes, this paper divides the water environment evaluation index system of rural residents into two levels. As is shown in the table 1, the first level mainly includes three aspects, including water supply safety, drainage safety and objective factor. The second level is subdivided into 8 aspects, which are embodied in daily per capita water consumption, use of water supply, water quality, water supply mode, precipitation discharge, domestic drainage treatment, natural conditions and economic level. The structure system is simple and clear to build the evaluation system of water resources and environment, which is a reference for improving the quality of rural water resources and environment more efficiently.

| First level index       | Two level index                                      |
|-------------------------|------------------------------------------------------|
| Water supply safety     | Daily per capita water consumption                   |
|                         | Use of water supply                                  |
|                         | Water quality                                       |
|                         | Water supply mode                                   |
|                         | Precipitation discharge                             |
| Drainage safety         | Domestic drainage treatment                          |
| Objective factor        | Natural conditions                                  |
|                         | Economic level                                       |
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