# Comparative Study of Rural Water Supply Models, Technologies, and Long-Term Management Mechanisms in Southeastern and Northwestern China

Jiawei Chen

College of Life and Environmental Sciences, University of Birmingham, Birmingham B15 2TT, United Kingdom

**Abstract:** China's village and town drinking water systems face some challenges, including insufficient protection of water sources, outdated treatment processes and equipment, high leakage rate in distribution networks, serious risks of secondary pollution, and inadequate operation and management mechanisms. Enhancing the reliability of both water quantity and quality along the whole path from the source to the tap has therefore become an urgent task. This study systematically summarizes the selection and adaptation of water supply models in Chinese villages, and introduces key technologies and applications for supplying water from both conventional and non-conventional sources. Based on this, a set of long-term and targeted management mechanisms is constructed. By comparing the differences in water supply models between northwest and southeast China, the study summarizes experiences that are appropriate for different regions, providing scientific support and practical references for sustainable operation of rural safe drinking water projects.

## 1. Introduction

Since the Eleventh Five-Year Plan period, with the accelerated advancement of new countryside in China, the focus of rural water supply has changed from addressing basic drinking water shortage to ensuring the safety of rural drinking water. The water supply security level for 270 million rural residents has been improved, and the proportion of rural population covered by the rural scale water supply project has reached 56%, and the penetration rate of piped water has reached 87%, indicating a significant enhancement in rural water supply security.

In recent year, driven by policies and financial investment, the number of rural drinking water projects in China has increased sharply, and the level of water supply security in rural areas has been significantly improved (National Rural Drinking Water Safety Project Plan (2006–2010). **National Development and Reform Commission, Beijing).** But this process has also exposed a prevailing tendency to emphasize construction over management. Due to the generally small and highly dispersed scale of projects, and complex topographical and geological conditions; many rural drinking water projects have problems in operation stage, such as management ability failing to keep pace with the construction, water source exploitation is extensive and the protection of water source area is insufficient, early water supply network leakage is serious, water supply income is limited and management mode is single[1]. At the same time, some western and coastal regions are further constrained by structural challenges, including the difficulty and high cost of economically utilizing special water qualities such as high-fluoride and brackish water, relatively outdated water treatment processes and integrated treatment equipment, and a generally low level of intelligent and information-based supervision (Ministry of Environmental Protection, 2012. National Rural Drinking Water Safety Status Survey Report).

Based on a survey of 1,639 rural centralized water supply facilities in eight provinces, Zhang and Tao (2012) reported that in more than 90% of the water projects the designed supply capacity was below 1,000 $m^3/d$, with small plants of 20–200 $m^3/d$ accounting for 57%. Their service areas were mostly limited to a single village or smaller groups, exhibiting a pattern characterized by "small scale and multiple points". Further analysis showed that the disinfection implementation rate among the plants was only 47.71%, implying that more than half of rural water plants did not have a routine disinfection regime in daily operation. Approximately 80% of the plants were managed by personnel appointed by village collectives, governments, or agencies, and had not achieved economic or managerial independence; only about 16% of the plants actually operated under a self-financing, profit-and-loss accountability model. Only 17.33% of the plants were profitable, 24.83% were operating at a loss, and about 2% either did not charge water fees or relied primarily on subsidies from village collectives. This study reflects, from an economic perspective, the limited revenue base and the overly uniform management model of rural drinking water projects[1].

---

Email: Chanjw98@163.com

According to the evaluation of the Eleventh Five-Year Plan for National Rural Drinking Water Safety Projects, by the end of 2009, the drinking water safety of approximately 312 million rural residents in China was still not guaranteed; the drinking water quality for about 220 million people did not meet standards. Some rural residents have been drinking water that did not meet the standards for a long time, such as high-fluoride water, high-arsenic water, brackish water, high iron-manganese water, and polluted water (Ministry of Environmental Protection, 2012. National Rural Drinking Water Safety Status Survey Report).These early data indicate that the complex geological and hydro-geological conditions in some western and coastal regions have led to specific local water quality problems, and also reveal shortcomings at that time in preliminary work such as water-source protection, project site selection, and water-source assessment (National Rural Drinking Water Safety Project Plan (2006–2010). National Development and Reform Commission, Beijing).

Results from a national survey on rural drinking water safety show that, by the end of 2004, Some rural centralized water supply projects only have the functions of water intake and water distribution, lacking adequate water treatment facilities and routine water quality monitoring. Only about 8% of centralized water supply projects were equipped with water treatment facilities, and some of these had never conducted any water quality testing (National Rural Drinking Water Safety Project Plan (2006–2010). National Development and Reform Commission, Beijing). Combined with the results of the investigation report of 1639 water plants in 8 provinces, the overall disinfection rate is only 47.71%, and the disinfection rate of the water plants managed by assigned personnel is only about 42%. This highlights the significant weakness in China's rural centralized water supply system regarding disinfection and water quality assurance [1]. Moreover, in the more economically developed eastern regions, the construction, operation, and maintenance of rural drinking water infrastructure are relatively well established, but the situation in the central and western regions lags behind, there are numerous latent risks in the drinking water safety of this area.

Regarding the models of rural water supply, Guo Kongwen and Hu Meng compared the applicability, advantages, and disadvantages of centralized, decentralized, and urban–rural integrated water supply schemes [2]. Based on the analysis of typical projects, it is proposed that the different modes, such as centralized pipe network, small-scale decentralized project and multi-village joint project, should be selected according to the conditions of topography, population density and economic capacity [2][3].A comparative study by the World Bank on rural water supply service models in multiple countries categorized rural water supply services into community management, direct provision by local governments, direct provision by public utilities, private sector provision, and supported self-supply, and developed a sustainability assessment framework encompassing institutional capacity, financing and financial security, asset management, water resources management, and regulation and monitoring (Rural Water Supply Services: A Comparative Analysis of Service Delivery Models. World Bank, Washington, DC).

In terms of water supply technologies, Jiang et al. (2024) conducted a systematic review of rural drinking water treatment technologies in China and abroad.They pointed out that international research has mainly focused on processes for ensuring safe water supply, ultrafiltration, and conventional filtration [4]. However, there is little research on the management and treatment technology of drinking water in China.They further noted that fluoride removal and risk assessment in drinking water have become important development directions for rural drinking water treatment in China, while safe water supply, ultrafiltration, and conventional filtration technologies constitute the main development directions in other countries [4].The study also indicated that nanofiltration technologies can effectively address exceedances of iron, manganese, arsenic, and fluoride in source water, and that combined processes centered on ultrafiltration membranes have already been applied in rural drinking water treatment practice. These findings provide a useful reference for the selection of process routes for rural water supply in regions with complex water quality conditions.

In terms of water quality sanitation and risk control, Yang (2016) conducted an analysis of the factors influencing water quality in rural China, including drinking water sources, the construction of water supply projects, water treatment processes, and water distribution. The study concluded that in some regions there remain problems such as low disinfection rates, exceedances of toxicological indices, and insufficient protection measures for water sources, and therefore recommended the wider application of simple and reliable disinfection processes as well as the establishment and improvement of a robust water quality monitoring system [5].

Laauwen and Nowicki (2024), through a comparative analysis of drinking water treatment technology cases in rural areas of South America, Africa, and Asia,examined the feedback relationships among technology selection, cost structures, operation and maintenance capacity, and user acceptance. They emphasized that only when simple and reliable processes are combined with stable operation and maintenance funding and training systems can sustainable implementation of disinfection and treatment processes be achieved [6].

In terms of evaluation and monitoring methods for drinking water safety, Luo and Zhai (2019) reviewed existing quantitative approaches and pointed out that rural drinking water safety is characterized by fuzziness, dynamics, and wide spatial heterogeneity. Moreover, a single indicator cannot adequately reflect the regional drinking water safety status, requiring the integrated application of multi-index methods such as Analytic Hierarchy Process(AHP), Fuzzy Comprehensive Evaluation, and TOPSIS [7]. Subsequent studies have applied these methods at provincial, county, and river-basin scales to assess rural drinking water safety, identify key high-risk areas and weak links, and thereby provide a basis for project and funding planning [7][8].

The literature review and regional survey on public health also analyzed the rural drinking water safety from the perspective of health risk and monitoring system construction.These studies show that, in some regions, bacteriological indicators and parameters related to endemic diseases—such as fluoride and arsenic—still exceed permissible limits, and that water quality non-compliance is often closely associated with incomplete monitoring networks, insufficient testing capacity, and poor communication of information [1][5]. Researchers have proposed establishing tiered water quality monitoring networks, promoting the sharing of test results between health authorities and water supply providers, and applying methods such as Hazard Analysis and Critical Control Points (HACCP) to address rural drinking water safety challenges [5].

In terms of management mechanisms, studies in the fields of water resources and public administration in China generally indicate that rural drinking water safety projects suffer from weak post-construction management, low tariff levels, unclear cost accounting, and ambiguous property rights and operation-and-maintenance responsibilities, resulting in widespread deficiencies in project management [1][9].Through the analysis of the system and practice in typical areas, the researchers suggest that the property right and management subject should be clarified, the hierarchical management system should be established, and the project should be able to operate stably for a long time through the water price reform [9][10].

At present, research on rural drinking water is mostly concentrated on specific technologies or on the exploration of water supply management models in particular regions. In contrast, studies that simultaneously address the development of village and town drinking water sources, water quality improvement, and the integrated system of technologies and operation–management for ensuring village and town drinking water safety remain relatively limited.

This study investigates ways to enhance the technical level and management capacity of village and town drinking water in China along the entire “source-to-tap” chain, and develops a comprehensive solution package that integrates water supply models, technologies, and management for villages and towns, thereby providing scientific support for future improvements in the security of village and town water supply in China.

Specifically, this study contributes by: (1) developing a unified framework that couples supply models, treatment technologies, and long-term management mechanisms along the “source-to-tap” chain; (2) conducting a cross-regional comparison between typical northwestern and southeastern cases to reveal context-dependent pathways for sustainability; and (3) translating the findings into actionable guidance for model selection, technology routing, and governance design.

## 2. Selection and Implementation of Water Supply Model in Villages

Given China’s highly diverse natural conditions and the uneven levels of economic and social development across villages and towns, rural water supply models can be broadly categorized into three main types: **(1) urban–rural integrated water supply:** by expanding the capacity and service coverage of urban and key township water treatment plants and extending distribution pipelines into rural areas, an interconnected centralized water supply system is formed, thus realizing integrated rural water supply whereby rural users share the same network, water quality, and management as urban users; **(2) township-based centralized water supply:** medium- and small-scale water treatment plants are constructed at the township level or for clusters of several villages, with water supply radiating to surrounding areas; **(3) single-village decentralized water supply:** in remote regions and high-altitude, cold areas, decentralized water supply facilities are constructed on a single-village basis, accompanied by appropriate purification and disinfection processes [11].

Within each of these water supply models, multiple subtypes can be further distinguished according to the entities responsible for construction and management, ownership and management rights, and the scope of beneficiaries. Given the wide variety of operational management models for rural water supply projects, the choice of an appropriate model should fully take into account local geographical characteristics, water resource conditions, levels of economic development, and future development plans of villages and towns:

(1) **Influence of geographical characteristics:** In selecting management models for rural water supply projects, local geographical conditions should be given particular emphasis. Topographic features such as plains, mountainous areas, hilly regions, or deserts determine the degree of dispersion of rural settlements and the feasible modes of water supply, and consequently shape the cost and scale of rural water supply schemes. Appropriate operation and management models should therefore be chosen on the basis of a comprehensive consideration of settlement elevation and terrain distribution, population distribution, and the characteristics of local water sources [12].

(2) **Influence of water resource conditions:** The quality, quantity, and carrying capacity of water sources are also key factors in selecting models for rural water supply projects. Surface water sources with good quality and abundant yield, whose abstraction does not impair their original functions, as well as groundwater sources that do not cause continuous groundwater level decline, water quality deterioration, or land subsidence when exploited, can serve as sources for medium- and large-scale centralized rural water supply schemes. In areas where settlements are highly dispersed and local water quality is relatively good, elevated storage tanks can be used to provide small-scale or even single-household water supply. Where the quality and quantity of existing water sources fail to meet requirements, it is necessary to replace or augment water sources and to construct additional regulation and storage works [13].

(3) **Influence of local economic development:** The level of investment in rural water supply projects largely determines their subsequent planning and development, while the local level of economic development shapes the choice of water supply models. In economically underdeveloped regions, the affordability of water tariffs

for residents must also be taken into account. Local governments should make full use of existing facilities in order to maximize the benefits of centralized water supply schemes. In selecting water supply models, a diversified approach is preferable; centralized water supply projects that generate a certain level of revenue may be entrusted to professional companies for operation and management [11].

(4) **Influence of future development planning for villages and towns:** The construction of rural water supply projects should take into account the overall development plans, development demands, and regional economic structure of local villages and towns, and on this basis define appropriate requirements for the scale and quality of rural water supply. Long-term development of the local water supply sector should be considered, and implementation should proceed in a planned and phased manner [14].

In addition, some recent case-based studies emphasize that the establishment of digital supervision platforms and data-enabled operation and maintenance can strengthen long-term performance, especially for integrated and regionalized rural water supply systems [15].

## 3. Key Technologies and Applications of Water Supply in Rural Areas

This study has selected several key technologies from the conventional water source and the unconventional water source, and summarized as follows in Table 1:

**Table 1.** Summary of Conventional and Unconventional Water-Source Treatment Technologies and Their Application Status

| Technology Type | Technology Name | Applicable Features | Key Problems Addressed | Main Content | Application Status |
|---|---|---|---|---|---|
| Conventional Water Source Technology | Ultrafiltration Combined Process | Suitable for complex surface and groundwater; simple operation | Turbidity, suspended solids, microbiological indicators | Uses ultrafiltration membranes as the core, with pre-treatment units (coagulation and sedimentation) and disinfection modules to remove pollutants and pathogens | Widely applied in centralized water supply projects in central and eastern China; treatment capacity ranges from 100–1000 m³/d |
| Conventional Water Source Technology | Nanofiltration Technology | High removal efficiency for small-molecule pollutants; low energy consumption | Iron, manganese, fluoride, arsenic, and other inorganic pollutants | Employs selective separation via nanofiltration membranes to precisely remove targeted inorganic contaminants while retaining beneficial minerals | Effective in centralized water supply projects in northwestern and southwestern mountainous areas with groundwater contamination |
| Conventional Water Source Technology | Simplified Disinfection Process (e.g., Chlorine Dioxide Disinfection) | Low cost, simple operation, no complex equipment required | Low disinfection efficiency, microbiological risks | Uses on-site generation of chlorine dioxide for post-treatment disinfection, effectively inactivating pathogenic microorganisms | Widely used in small to medium-sized decentralized and small centralized systems; applicable to many towns in regions with water shortages |
| Non-Conventional Water Source Technology | Brackish Water Desalination (Reverse Osmosis) | Suitable for high-salinity water sources; effective desalination | High-salinity surface and groundwater along coastal and inland areas | Removes salts through semi-permeable membrane separation, producing water that meets drinking standards | Applied in coastal regions and inland saline areas of western China; suitable for medium-scale rural projects |
| Non-Conventional Water Source Technology | High-Fluoride Water Treatment (Adsorption–Filtration) | Effective for high fluoride concentrations; low treatment cost | High fluoride levels in groundwater in western plateau regions | Uses activated alumina and other fluoride-adsorbing materials for effective defluoridation through adsorption and filtration | Widely adopted in high-fluoride groundwater areas of western China; treatment efficiency exceeds 95% |
| Non-Conventional Water Source Technology | Water Reuse Technology (Advanced Treatment Process) | Promotes water resource recycling; suitable for arid regions | Water resource shortage, insufficient water supply | Combines coagulation, sedimentation, filtration, disinfection, and advanced oxidation processes to treat reclaimed domestic water for non-potable uses, supplementing water resources | Pilot-tested in water-scarce and arid regions as a supplementary source for centralized supply, mitigating local water stress |

## 4. Study on the Long-term Management Mechanism of Water Supply in Towns and Villages

This study selects the northwest (for example, a county in Gansu Province) and the southeast (for example, a district in Zhejiang Province) as typical regions to analyze the characteristics of their long-term management mechanisms.

To illustrate the heterogeneity of rural water-supply governance, Figure 1 compares the proportions of common management arrangements in selected provinces. The marked differences across regions provide the empirical motivation for selecting typical northwestern and southeastern cases for in-depth analysis.

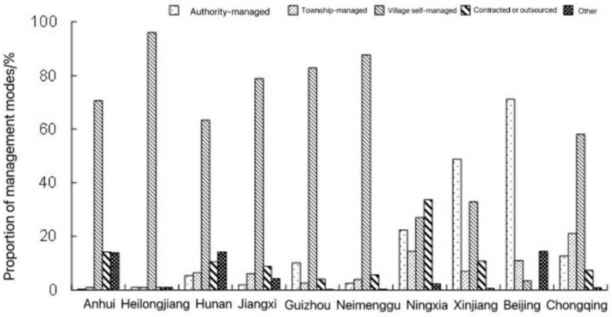

**Figure 1.** Shares of Rural Water Supply Management Arrangements in Selected Provinces (%)

### 4.1 Northwestern region: integrated water supply with a multi-source complementary management model

A county in Gansu Province, located on the Loess Plateau, is characterized by complex terrain, dispersed water sources, and the presence of areas with high-fluoride groundwater. The core features of its management mechanism are as follows:

- **Promotion of integrated water supply:** resources of small water treatment plants within the county are consolidated to establish a county-level water supply group, implementing “unified planning, unified construction, unified management, and unified operation and maintenance.” Township centralized water supply schemes are gradually interconnected with the urban distribution network, thereby achieving county-wide integration of water supply.
- **Multi-source complementary dispatch:** a multi-source water supply system incorporating “surface water + groundwater + regulation and storage works” is established, together with a dynamic monitoring mechanism for water sources. Based on the water quality and quantity conditions of different sources, cross-regional complementary water supply is achieved through regulating reservoirs and transmission–distribution networks, thereby ensuring stable water supply during dry periods.
- **Tiered responsibility implementation:** the county-level water resources authority is designated as the primary regulatory body, township governments assume territorial management responsibilities, and water supply enterprises serve as the operation and maintenance entities. A tripartite responsibility agreement is signed to specify and refine duties related to water quality monitoring, pipeline network maintenance, water tariff collection, and other operational tasks.
- **Subsidy mechanism:** taking into account the local economic level and households’ ability to pay, a “basic tariff + increasing block tariff” system is implemented, with water fee subsidies provided for low-income groups. The county-level government establishes a dedicated rural water supply fund to support the rehabilitation of aging distribution networks and to ensure emergency water supply guarantee.

(This arrangement is consistent with the county-level unified management method discussed in recent studies.)[16]

### 4.2 Southeast China: Digital Management + "Single Village” + “Centralized” Collaborative Model.

A district in Zhejiang Province, located in the Yangtze River Delta urban agglomeration, features a developed economy, dense population, and relatively abundant yet unevenly distributed water resources. The core characteristics of its management mechanism are as follows:

- **Digital and intelligent management:** a smart supervision platform for rural water supply is established, integrating data from online water quality monitoring, pipeline pressure monitoring, and water consumption metering, thereby enabling real-time monitoring of water plant operation and automatic alarming in the event of abnormalities. A mobile application is used to facilitate online payment of water charges and provide one-click submission and response for repair requests.

(Digital water affairs platforms supporting integrated supply O&M have been reported in recent case studies.)[15]

- **“Single-village + centralized” coordinated layout:** suburban villages are incorporated into the integrated urban piped water supply network, while remote mountainous areas adopt a “multi-village joint centralized supply +single-village decentralized supplementation” model, thereby forming a fully covered water supply network with no blind spots.
- **Market-oriented operation and maintenance mechanism:** professional water utilities are engaged to take responsibility for project operation and management, with the O&M entity selected through open tendering. Performance-based contracts are signed, linking operation and maintenance fees to assessment indicators such as the rate of compliance with water quality standards, water supply reliability, and user satisfaction [17].
- **Market-oriented reform of water tariffs:** water prices are set on the basis of full cost accounting, covering water resource fees, capital construction costs, and operation and maintenance expenses, so as to use price signals to encourage households to conserve water. A

dynamic tariff adjustment mechanism is established to adjust water prices in a timely manner in line with changes in general price levels and operating costs[18].

Figure 2 further compares rural water tariff levels across provinces. The evident differences in tariff levels are consistent with variations in water-resource constraints, service levels, and local affordability, and therefore justify differentiated tariff, subsidy, and cost-recovery strategies in the two typical regions.

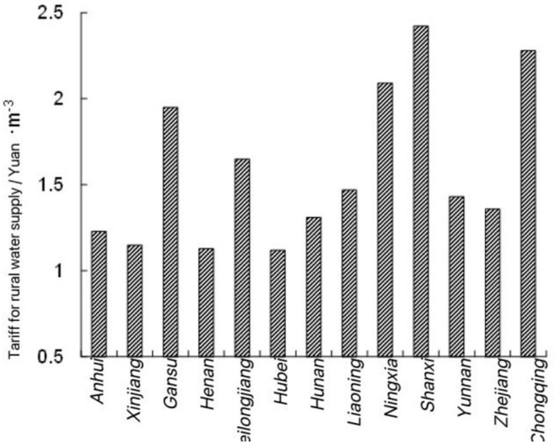

**Figure 2.** Rural Water Supply Tariff Levels in Selected Provinces (CNY/$m^3$)

## 5. Conclusion

This study addresses the core challenges of ensuring safe drinking water in China's villages and towns and develops an integrated solution framework of "model adaptation–technological support–management assurance." In terms of water supply models, it proposes a differentiated selection pathway based on geographical characteristics, water resource conditions, economic development level, and future development planning, encompassing three core models: urban–rural integrated supply, township-based centralized supply, and single-village decentralized supply. In terms of key technologies, it identifies and synthesizes priority technologies for both conventional and non-conventional water sources, thereby providing targeted technical options for regions with different water quality conditions. In terms of long-term management, by comparing regional practices in northwestern and southeastern China, the study distills characteristic mechanisms such as "integrated water supply with multi-source complementarity" and "digital management with coordinated spatial layout."

The research outputs achieve full-process coverage of technologies and management from "source to tap," providing scientific support for addressing problems such as insufficient protection of water sources, outdated treatment processes, and weak management in village and town water supply systems in China. Looking ahead, further efforts can be made to strengthen the integrated innovation of technical and management models across different regions, to promote the development of rural water supply projects towards smarter and more sustainable modes, and to continuously enhance the security of drinking water in villages and towns.

**Theoretical implications:** The findings suggest that the sustainability of rural water supply cannot be adequately explained by infrastructure investment or treatment performance alone. Instead, it emerges from the coupling of (i) source constraints and risk profiles, (ii) technology appropriateness and operational simplicity, and (iii) governance capacity, financing arrangements, and monitoring/regulatory mechanisms. The proposed "model–technology–management" coupling perspective offers a transferable way to interpret why similar technical schemes may perform differently across regions and provides a basis for future comparative studies and integrative evaluations.

**Practical implications:** For water-stressed or quality-constrained northwestern counties, priority should be given to county-wide integration with multi-source complementary dispatch and clarified tiered responsibilities, complemented by targeted subsidies to ensure affordability and stable O&M funding. For economically developed southeastern districts, digital supervision platforms, professionalized O&M with performance-linked contracts, and full-cost-based tariff mechanisms can jointly improve reliability, compliance, and user satisfaction. Overall, the study provides a replicable toolkit—covering model selection, technology routing for conventional/unconventional sources, and long-term management instruments—that can guide local adaptation under different geographical, socio-economic, and water-resource conditions.

## References

1. Zhang, Q. and Tao, Y., 2012. Current situation and countermeasures for the operation and management of rural centralized water supply projects. China Water Resources, (12), pp.34–36. URL: https://scholar.google.com/scholar?q=Zhang+Tao+2012+rural+centralized+water+supply+operation+management+China+Water+Resources
2. Guo, K. and Hu, M., 2006. Selection and practice of rural water supply models. China Rural Water and Hydropower, (8), pp.45–47. URL: https://scholar.google.com/scholar?q=Guo+Hu+2006+Selection+and+practice+of+rural+water+supply+models
3. Liu, X. et al., 2005. Discussion on the construction and management of rural centralized water supply projects. Water Resources Development Research , (11), pp.32–34. URL: https://scholar.google.com/scholar?q=Liu+2005+construction+and+management+of+rural+centralized+water+supply+projects
4. Jiang, Z. et al., 2024. Progress in rural drinking water treatment technologies in China and abroad. Technology of Water Treatment, 50(3), pp.1–8. URL: https://scholar.google.com/scholar?q=Jiang+2024+Progress+in+rural+drinking+water+treatment+technologies+in+China+and+abroad
5. Yang, G., 2016. Current status and safeguard measures for rural drinking water safety in China.

Journal of Public Health and Preventive Medicine , 27(2), pp.123–125. URL: https://scholar.google.com/scholar?q=Yang+2016+Current+status+and+safeguard+measures+for+rural+drinking+water+safety+in+China

6. Laauwen, M. and Nowicki, S., 2024. Reinforcing feedbacks for sustainable implementation of rural drinking-water treatment technology. ACS ES&T Water, 4(4), pp.1763–1774. DOI: 10.1021/acsestwater.3c00779.
7. Luo, P. and Zhai, D., 2019. Review of evaluation methods for rural drinking water safety. Water Resources Protection , 35(4), pp.67–73. URL: https://scholar.google.com/scholar?q=Luo+Zhai+2019+Review+of+evaluation+methods+for+rural+drinking+water+safety+%E6%B0%B4%E8%B5%84%E6%BA%90%E4%BF%9D%E6%8A%A4
8. Li, B. and Yang, J., 2014. County-level assessment of rural drinking water safety based on fuzzy comprehensive evaluation. China Rural Water and Hydropower, (5), pp.156–159. URL: https://dianda.cqvip.com/Qikan/Article/Detail?id=661541270.
9. Fan, Y., 2017. Reform of the property rights system and management models for rural drinking water safety projects. Water Resources Economy, 35(3), pp.68–71. URL: https://scholar.google.com/scholar?q=Fan+2017+property+rights+system+management+models+rural+drinking+water+safety+projects+%E6%B0%B4%E5%88%A9%E7%BB%8F%E6%B5%8E
10. Li, T. et al., 2012. Practice and reflections on water tariff reform for rural water supply projects. China Rural Water and Hydropower, (8), pp.134–136. URL: https://scholar.google.com/scholar?q=Li+2012+water+tariff+reform+rural+water+supply+projects+China+Rural+Water+and+Hydropower
11. Hu, M., Wen, T., Yao, B., Li, L. and Su, Q., 2025. Thoughts on standardized development of rural water supply. China Rural Water and Hydropower, (12), pp.118–122. DOI: 10.12396/znsd.2501213.
12. Wu, H., 2024. A practical study on the construction and management of urban–rural water supply integration in mountainous areas of Guizhou Province. Water Resources Development Research, (12), pp.95–99. URL: https://scholar.google.com/scholar?q=%E8%B4%B5%E5%B7%9E%E7%9C%81%E5%B1%B1%E5%8C%BA%E5%9F%8E%E4%B9%A1%E4%BE%9B%E6%B0%B4%E4%B8%80%E4%BD%93%E5%8C%96%E5%BB%BA%E8%AE%BE%E7%AE%A1%E7%90%86%E7%9A%84%E5%AE%9E%E8%B7%B5%E7%A0%94%E7%A9%B6
13. Ma, Z., Li, W., Li, Y., Li, J. and Wang, J., 2024. Research on the Current Situation and Sustainable Development Measures for Urban–Rural Water Supply Integration in Yunnan Province, China. Water, 16(22), 3232. DOI: 10.3390/w16223232.
14. Xu, J., 2022. Fourteenth Five-Year Plan (2021–2025) construction plan for urban–rural water supply integration in Lianjiang County. Water Conservancy Science and Technology, (02), pp.32–35. URL: https://scholar.google.com/scholar?q=%E8%BF%9E%E6%B1%9F%E5%8E%BF%E5%9F%8E%E4%B9%A1%E4%BE%9B%E6%B0%B4%E4%B8%80%E4%BD%93%E5%8C%96%E2%80%9C%E5%8D%81%E5%9B%9B%E4%BA%94%E2%80%9D%E5%BB%BA%E8%AE%BE%E8%A7%84%E5%88%92
15. Dai, F., 2023. Practical exploration of digital water management for urban–rural water supply integration in Longyan City. Water Conservancy Science and Technology, No.178(01), pp.31–33. URL: https://scholar.google.com/scholar?q=%E9%BE%99%E5%B2%A9%E5%B8%82%E5%9F%8E%E4%B9%A1%E4%BE%9B%E6%B0%B4%E4%B8%80%E4%BD%93%E5%8C%96%E6%95%B0%E5%AD%97%E6%B0%B4%E5%8A%A1%E5%BB%BA%E8%AE%BE%E5%AE%9E%E8%B7%B5
16. Hu, M., Li, L. and Bao, Y., 2025. Thoughts on county-level unified management of rural water supply. China Water Resources, (8), pp.22–27. DOI: 10.3969/j.issn.1000-1123.2025.08.005.
17. Liu, Y., Chen, J., Yao, X. and Wu, H., 2023. Research on the selection of contractors for government-purchased O&M services of small- and medium-sized water conservancy projects. China Rural Water and Hydropower, (9), pp.97–102. DOI: 10.12396/znsd.222136.
18. Liu, S., Hu, C., Wang, S., Guo, X., Niu, C., Quan, L. and Li, M., 2024. Research on multi-source and multi-user water pricing mechanism based on a dynamic game model: A case study of Yiwu City. China Rural Water and Hydropower, (5), pp.169–175. DOI: 10.12396/znsd.231656.