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Research on Rural Human Settlements Environment Governance in China: Current Situation, Theory and Path—An Analysis Based on Literature Review

Liangyan Lu[1], Guoxi Wang[2]*, Huimin Shao[3], Mei Hu[4]

[1]College of Finance and Accounting, Yunnan University of Economics and Management, Kunming, China
[2]College of Economics, Yunnan Normal University, Kunming, China
[3]College of Management, Yunnan Normal University, Kunming, China
[4]Business of School, Yinchuan University of Energy, Yinchuan, China

***Corresponding author:** *Guoxi Wang, 2330140036@ynnu.edu.cn*

Abstract: This paper systematically combs literature on China's rural human settlements environment governance (RHSEG), focusing on its current status, problems, theoretical frameworks, practical cases, and optimization paths. Policy-driven progress has been made in infrastructure and multi-stakeholder collaboration, but challenges persist: uneven resource allocation, formalized public participation, and poor systemic synergy. By integrating theoretical insights (e.g., meta-governance, soft law governance) and practical cases, this study proposes differentiated strategies for eastern, central, and western regions, and clarifies directions for technological innovation and mechanism improvement, providing theoretical references for rural revitalization.

Keywords: Rural human settlements; Governance mechanism; Regional difference; Policy feedback; Effect evaluation

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1. Introduction

1.1. Research background

Against the backdrop of China's rural revitalization strategy, rural human settlements environment (RHSE) has emerged as a critical indicator of farmers' well-being and sustainable rural development. Since the 2018 "Three-Year Action Plan for Rural Human Settlements Improvement", the central government has invested over 500 billion yuan in waste disposal, sewage treatment, and toilet renovation [1]. However, challenges remain: in western rural areas, only 28% of villages have centralized sewage facilities, and 45% of farmers report dissatisfaction with waste management [2]. These issues directly affect rural residents' health and hinder urban-rural integration.

1.2. Research purpose and significance

Urbanization has widened the urban-rural environmental gap, making RHSEG a focal point of policy. While policies like the 2021 "Opinions on Improving Rural Human Settlements" emphasize multi-subject participation, practical dilemmas persist: insufficient funding in underdeveloped regions, low farmer engagement, and mismatched technology supply [3]. This study synthesizes literature to address three questions: (1) What progress and bottlenecks exist in RHSEG? (2) How do theoretical frameworks inform practice? (3) What region-specific strategies can optimize governance?

2. Current situation and problems

2.1. Key progress

Infrastructure upgrading: Eastern provinces (e.g., Zhejiang) achieved 90% coverage of waste classification systems, while central regions promoted toilet renovation, reducing infectious diseases by 30% [1].

Multi-stakeholder collaboration: In Jiangsu's County C, governments coordinated enterprises to fund sewage treatment (40% of total investment), while villages organized volunteer teams, cutting governance costs by 25% [4].

Participation mechanisms: Northern Jiangsu's Village Y used "red-black lists" and an integrating system (point systems) to link environmental compliance to collective dividends, raising voluntary participation from 22% to 68% [5].

2.2. Core challenges

Resource imbalance: Eastern regions allocate 386 yuan per capita annually to RHSEG, vs. 124 yuan in western regions. Market capital covers 35% of eastern funding but <5% in the west, leading to 40% lower sewage treatment capacity [2].

Passive participation: Surveys show 67% of farmers only participate when mandated by village cadres, due to unclear benefits (e.g., pollution liability) and grassroots "indicator completion" orientations [6].

Systemic fragmentation: Governments prioritize infrastructure construction (60% of budgets), while enterprises focus on profitable technologies (e.g., smart monitoring), leaving 70% of villages with unmaintained facilities [3].

3. Theory and practice

3.1. Theoretical foundations

Meta-governance: Governments act as "orchestrators" to integrate resources—e.g., in Zhejiang, provincial governments coordinated tech firms to provide digital platforms, reducing cross-departmental delays by 40% [7].

Soft law governance: Village rules (e.g., banning open burning) and Women's Federation-led campaigns in Sanmen County, Zhejiang, mobilized 82% of women to participate in cleaning, leveraging social norms over formal regulations [5, 8].

Administrative activation of autonomy: In Shandong villages, combining government subsidies (30% of facility costs) with village assemblies to decide project priorities raised maintenance rates from 55% to 89% [9].

3.2. Representative cases

Digital governance: Documented how Jiangsu's rural "smart waste management" platforms (real-time monitoring

+ WeChat reporting) reduced collection delays by 60% and increased recycling rates from 18% to 42% [10].

Policy feedback: Compared two villages: an eastern village with monthly farmer feedback meetings adjusted sewage policies, improving satisfaction by 40%; a western village without feedback saw 35% policy implementation deviation [10].

Women's participation: Sanmen County's Women's Federation organized "cleanliness competitions" and linked results to family honor, making women 58% more active than men in daily maintenance [8].

3.3. Regional governance models

Eastern: "Digital+market" model—e.g., Zhejiang's Sanmen County uses corporate sponsorships (20% of funding) and apps for participation, focusing on refined management [8].

Central: "Government+collective" model—Henan villages rely on fiscal transfers (60% of funding) and village committees to maintain basic facilities [2].

Western: "Policy-led" model—Yunnan uses central subsidies (80% of funding) for priority projects like waste pits, with limited technology adoption [11].

4. Mechanisms and paths

4.1. Critical mechanisms

Collaborative governance: Success requires clear role division—governments (policy/ funding), enterprises (technology), villages (implementation). Jiangsu's County C formalized this via contracts, reducing conflict by 50% [4].

Policy feedback: Bottom-up mechanisms (e.g., quarterly farmer surveys) enable adaptive policies. In Anhui, such feedback adjusted sewage charges, increasing payment compliance from 62% to 91% [12].

Grassroots autonomy: Allowing villages flexibility in project selection (e.g., prioritizing wells over parks in arid areas) reduced "white elephant" projects by 35% [6].

4.2. Practical paths

Institutional innovation: Proposed "vertical leap" (eastern capital flows west via tax incentives) and "horizontal promotion" (inter-village alliances for shared facilities), tested in Guangxi to reduce regional gaps by 20% [11].

Technological adaptation: Northern Jiangsu's Village Y combined 30% government subsidies for small-scale sewage equipment with farmer training, raising usage from 30% to 75% [5]. For the elderly, simplified digital interfaces (e.g., voice commands) improved platform use from 15% to 50% [13].

5. Effect evaluation and optimization

5.1. Evaluation methods

fsQCA: Identified two effective models: "dual-track governance" (government + market) in rich regions, and "emotional incentives" (village cohesion) in poor regions [14].

EBM model: Found national governance efficiency rose 12% from 2007–2021, with eastern regions (0.92) outperforming western (0.68) due to technology adoption [15].

Dynamic evaluation: (2024) tracked 12 indicators (e.g., green space, pollution levels), showing eastern scores (78/100) vs. western (52/100) in 2023 [16].

5.2. Optimization strategies

Adaptive governance: Villages with strong autonomy (e.g., western Guangdong's H City) use soft law; weak governance villages need meta-governance [17]. A "governance maturity index" (autonomy + resources) helps match models.

Interest linkage: Tying environmental efforts to land dividends in Sichuan villages raised participation from 40% to 85% [13].

6. Conclusion

Progress includes infrastructure gains and collaborative models, but gaps persist in resource allocation, participation, and regional adaptation. Future research should focus on: (1) digital technology suitability for vulnerable groups; (2) balancing efficiency with farmers' well-being. Policies should mandate "farmer-village-county" quarterly feedback, with indicators like elderly digital adoption (≥50%) and investment efficiency (≥20 tons sewage/10,000 yuan) [16].

Disclosure statement

The author declares no conflict of interest.

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