Research on the Impact of Environmental Regulation on the Environmental Responsibility Behavior of Residents in Grassland Tourist Areas: A Case Study of Inner Mongolia

Lei Yu[ab]*

a. Department of Tourism Inner Mongolia Normal University, Hohhot, China
b. Inner Mongolia Agricultural University, Hohhot, China

Abstract: Environmental regulation is increasingly pivotal in addressing global ecological challenges and advancing sustainable development. This study examines environmental regulation's influence on residents' environmental responsibility behavior in Inner Mongolia's grassland tourist areas. Inner Mongolia, characterized by its vast grasslands and rich ethnic culture, is a hub for tourism, yet faces significant environmental pressures from this growth. This research integrates a theoretical framework with empirical findings to assess how regulatory measures impact ecological awareness and practices among residents. By employing surveys, interviews, and statistical modeling, the study reveals that environmental education, legal frameworks, and participatory management significantly enhance residents' ecological responsibility. Policy recommendations include bolstering environmental education, fostering community participation, and optimizing regulatory measures for sustainable tourism development.

Keywords: environmental regulation, environmental responsibility behavior, grassland pastoral areas, tourist areas

1. Introduction

Grassland ecosystems serve as critical ecological barriers and cultural heritage sites, particularly in regions like Inner Mongolia, which accounts for approximately 22% of China's grasslands. Renowned for its biodiversity and traditional landscapes, Inner Mongolia has become a focal point of tourism development. In 2022 alone, the region welcomed over 150 million tourists, generating tourism revenues exceeding 250 billion RMB. However, this rapid expansion has brought environmental challenges, including resource overexploitation and ecosystem degradation.

The environmental health of Inner Mongolia's grasslands holds local and national significance. As a fragile ecological zone, its preservation is vital for regional biodiversity, climate regulation, and cultural sustainability (Suo & Leng, 2024). Environmental regulation emerges as a central strategy to mitigate these pressures, aligning government actions, community engagement, and individual behaviors toward ecological preservation.

While existing research has explored environmental regulation broadly, there is limited focus on its role in grassland tourist areas. Inner Mongolia's unique socio-ecological context offers an opportunity to expand theoretical and practical understanding. This study seeks to address this gap by investigating how environmental regulation influences residents' environmental responsibility behaviors in these regions.

2. Theoretical Foundation and Literature Review

Environmental regulation refers to a set of legal, administrative, and policy mechanisms used by governments and institutions to mitigate the ecological impacts of human activities (Yu et al., 2024). Its primary objectives include promoting sustainable development, preserving natural resources, and reducing pollution across air, water, and soil systems. The evolution of environmental regulation highlights its significance in addressing ecological challenges. Early frameworks like the UK's 1889 Pollution Act laid the groundwork for modern legal instruments, and by the mid-20th century, comprehensive measures such as the U.S. Clean Air Act and Clean Water Act broadened the scope of environmental governance by incorporating pollution control alongside sustainable resource management (Yang, 2024). These regulations are defined by three core characteristics. They are legally binding, compelling compliance among businesses, governments, and

individuals. For instance, China's Environmental Protection Law enforces emission standards with penalties for violations to ensure adherence (Chen, 2024). They are universal, encompassing all sectors and entities that affect the environment to promote a holistic approach to ecological governance. Additionally, they are adaptable, evolving with advancements in technology and shifting socio-economic landscapes, as exemplified by China's revisions to its Environmental Impact Assessment Law to address emerging challenges (Song Huifang, 2024).

In grassland pastoral regions like Inner Mongolia, environmental regulation extends beyond pollution control and encompasses ecosystem preservation to counter ecological degradation caused by tourism and pastoral activities (Xu & Bao, 2022). The growing importance of collaborative regulatory frameworks has led to multi-stakeholder models involving governments, businesses, and communities to achieve regulatory goals. Xia et al. (2024) argue that such collaborative models optimize outcomes, balancing green growth with carbon reduction. Environmental regulation can be categorized into three main types: administrative regulation, market-based regulation, and voluntary regulation. Administrative regulation involves direct interventions through laws, standards, and permits, such as China's emission limits, which compel pollution control (Wu & Xu, 2024). While effective, this approach often incurs high regulatory costs and can lack flexibility. Market-based regulation leverages economic tools like environmental taxes and trading systems to incentivize compliance. For example, Sweden's carbon tax has significantly reduced emissions, illustrating the effectiveness of financial instruments. Voluntary regulation encourages entities to adopt environmentally friendly practices of their own accord, as seen with the ISO 14001 standard, which fosters corporate social responsibility and enhances market competitiveness. In Inner Mongolia, these regulatory approaches have collectively contributed to grassland preservation. Policies like ecological compensation mechanisms and emissions trading have incentivized local communities and businesses to actively engage in environmental protection, thereby improving ecological outcomes (Zhang & Wang, 2024).

Environmental responsibility behavior integrates awareness, attitudes, and actions toward environmental stewardship. It involves voluntary choices informed by personal values, social norms, and external regulations. Responsibility behavior is multidimensional, encompassing awareness and motivation, moral and ethical considerations, and social support. Residents' understanding of environmental challenges often drives their actions, as Jingjing (2023) observed that heightened concern for ecological issues correlates with proactive environmental behaviors in Inner Mongolia. Responsibility behavior is also driven by ethical considerations, where individuals feel a moral obligation to protect the environment. Surveys indicate that over 80% of residents in Inner Mongolia express a strong ethical commitment to safeguarding their grasslands. Social and group dynamics further influence these behaviors, as community norms and institutional support enhance individual responsibility. He (2024) highlights how collective action and government partnerships significantly increase the adoption of sustainable practices.

Theoretical models provide insights into the drivers of environmental responsibility behavior. The Theory of Planned Behavior (TPB) posits that attitudes, subjective norms, and perceived behavioral control influence individual actions (Ajzen, 1991). This model explains how residents' perceptions and societal expectations shape their ecological behaviors. The Norm Activation Model (NAM), introduced by Schwartz (1977), emphasizes the role of moral obligations and social norms in motivating pro-environmental actions. In Inner Mongolia, traditional pastoral values align closely with NAM, reinforcing environmentally responsible behaviors. The Value-Belief-Norm (VBN) theory integrates values and beliefs with norms to drive ecological actions, suggesting that pastoral residents with strong ecological values are more likely to engage in sustainable practices (Stern et al., 1999). These models underline the importance of integrating behavioral and cultural factors into environmental governance strategies (Song, 2024).

A review of domestic and international research highlights critical factors influencing environmental responsibility behavior. Domestically, Wang Gang et al. (2019) emphasize the role of government-led initiatives in promoting awareness and sustainable practices. Li (2018) notes that community participation enhances residents' sense of responsibility, calling for stronger mechanisms to facilitate engagement. Du (2024) evaluated the environmental performance of a Power Company using the balanced scorecard method, finding that individual responsibility behaviors within the company could significantly enhance overall environmental performance, aligning with the analysis of resident responsibility behavior theory models. Liu et al., (2017) observed that traditional pastoral culture fosters ecological responsibility by promoting harmony with nature. Internationally, research extends these findings by constructing models that predict behavior and evaluate policy effectiveness across diverse contexts. In Nordic countries, policy transparency and public education have significantly enhanced ecological responsibility, while North American studies reveal the

impact of economic incentives like ecological taxes on sustainable behaviors (Liu, 2024). Australian research highlights the effectiveness of community-based social marketing in driving environmental engagement (Wang et al., 2024). These findings collectively suggest that integrating regulatory frameworks with local cultural and socio-economic contexts is essential for fostering environmental responsibility.

3. Current State of Environmental Regulation and Responsibility in Grassland Pastoral Tourist Areas

3.1 Overview of Tourism in Inner Mongolia's Grassland Areas

Inner Mongolia is home to some of the most iconic grassland ecosystems in the world, including the Hulunbuir Grassland, which is celebrated for its vast biodiversity and unique cultural heritage (Jingjing, 2023). Covering 118 million hectares—approximately 40% of China's usable grassland—the region provides critical ecological services and cultural value while attracting over 100 million tourists annually. In 2022, tourism revenue surpassed 200 billion RMB, making it a cornerstone of the local economy (Zhu, 2013). Natural attractions, such as Daihai Lake, Hulun Lake, and the Greater Khingan Mountains, alongside cultural events like the Nadam Festival and Mongolian yurt experiences, position Inner Mongolia as a premier tourist destination. However, the rapid expansion of tourism has heightened ecological pressures, including grassland degradation, water scarcity, and overexploitation of resources (Tang et al., 2021). To address these challenges, the government has prioritized sustainable development through initiatives like smart tourism management, environmental monitoring, and the establishment of ecological demonstration areas (Jiang, 2024). Measures such as rotational grazing and bans on overgrazing aim to balance economic development with grassland conservation (Wang, 2020).

3.2 Implementation and Challenges of Environmental Regulation

Government intervention is central to environmental regulation in Inner Mongolia. The Environmental Protection Law of the People's Republic of China and the Inner Mongolia Autonomous Region Ecological Environmental Protection Ordinance provide legal frameworks for environmental governance (Huang & Feng, 2024). These laws establish penalties for violations, mandate ecological impact assessments, and require compliance with grassland protection standards. In addition to legislative measures, the government has implemented monitoring systems for air, water, and soil quality. For instance, real-time environmental monitoring enables authorities to issue warnings and enforce regulations promptly (Zhou et al., 2024). Economic incentives, including subsidies for green tourism projects and tax reductions for eco-friendly technologies, further encourage sustainable practices (Wang Yan, 2012). In 2019, 200 million RMB was allocated to grassland ecological protection, demonstrating the government's commitment to balancing development with conservation (Li & Wang, 2023).

The active participation of pastoral residents is critical for effective environmental regulation. However, limited awareness of policies and inadequate economic incentives hinder resident engagement. Surveys indicate that 60% of residents have limited knowledge of environmental regulations, and only 30% participate in environmental protection activities (Zhu, 2013). Efforts to address these challenges include awareness campaigns, participatory governance mechanisms, and financial incentives. For example, village meetings and community gatherings provide platforms for residents to contribute to ecological decision-making. However, cultural barriers, particularly traditional pastoral lifestyles, complicate the adoption of modern environmental practices (He, 2024).

3.3 Residents' Environmental Responsibility Behavior

Environmental responsibility awareness among residents is shaped by education, cultural heritage, and government initiatives. Surveys reveal that 70% of residents attribute their environmental knowledge to government-led awareness campaigns, such as community tree-planting events and media broadcasts (Li & Zhong, 2024). Mongolian cultural traditions, which emphasize harmony with nature, further strengthen residents' ecological values. Despite high levels of awareness, translating this knowledge into action remains challenging. Nearly 40% of respondents cite economic constraints as barriers to adopting sustainable practices. Educational initiatives targeting lower-income residents and tailored economic incentives are needed to bridge this gap (Liang et al., 2024).

Residents' environmental responsibility behaviors manifest in waste sorting, participation in restoration projects, and support for ecotourism. Approximately 68% of households practice waste sorting, reducing

pollution and promoting resource recycling (Environmental Protection Department of Inner Mongolia, 2022). Community-led initiatives, such as grassland restoration and wetland protection, are also common. For instance, a vegetation recovery project in Xilingol League increased vegetation coverage by 15% due to strong community participation (Wang, 2020). Ecotourism offers another avenue for residents to engage in environmental protection. Many residents operate eco-friendly guesthouses or lead educational tours, integrating traditional cultural elements with sustainable practices. However, challenges persist in aligning these behaviors with modern environmental goals, particularly among older generations who adhere to traditional lifestyles (Liang et al., 2024).

The implementation of environmental regulations in Inner Mongolia illustrates the complex interplay between government initiatives, community participation, and residents' behaviors. While government-led measures have improved awareness and established frameworks for sustainable tourism, challenges such as limited resident engagement and cultural barriers remain. Strengthening participatory mechanisms and integrating traditional values with modern sustainability principles are crucial for addressing these challenges (Yu & Song, 2024). Tailored educational programs and economic incentives can further motivate residents to adopt environmentally responsible behaviors, ensuring the long-term sustainability of Inner Mongolia's grassland ecosystems (Zhou et al., 2024; Jingjing, 2023).

4. impact of Environmental Regulation on Environmental Responsibility Behavior
4.1 Impact on Residents' Awareness
4.1.1 Impact of Environmental Education and Awareness Campaigns

Environmental education and awareness campaigns play a crucial role in enhancing the environmental responsibility awareness of residents in Inner Mongolia's grassland pastoral areas. In recent years, these areas have significantly improved residents' environmental consciousness through multi-layered and multi-channel education and awareness activities. According to Zhu (2013), education activities for residents primarily occur across three levels: school education, community activities, and media campaigns. School education has been fundamental in cultivating residents' responsibility awareness. Environmental courses have gradually been integrated into the basic education curriculum in Inner Mongolia, teaching students about the vulnerability of grassland ecosystems and the importance of environmental protection. Statistics show that over 70% of primary and secondary schools in Inner Mongolia offer ecological protection courses that emphasize theoretical knowledge and practical activities, allowing students to experience the importance of environmental protection through field studies and extracurricular activities.

Community activities are an essential supplement to environmental education. Community organizations regularly hold various ecological protection activities, such as tree planting and grassland cleanup campaigns, which increase resident engagement and subtly enhance their environmental awareness. According to a survey by Jingjing at Inner Mongolia Normal University (2023), nearly 80% of residents who participated in such activities reported increased environmental awareness and a stronger sense of responsibility. Moders played a significant role in environmental awareness campaigns. With the development of information technology, television, radio, and the internet have become key channels for spreading environmental knowledge. The government and environmental organizations use these media to broadly disseminate environmental concepts and knowledge. In recent years, the spread of social media has enabled environmental messages to reach a wider audience more quickly. According to local statistics, over 60% of residents in Inner Mongolia obtain environment-related information through television and the internet. Such widespread and timely information dissemination greatly promotes public interest in environmental issues (Wang Zheng, 2024). However, challenges remain in environmental education and awareness campaigns. Some residents' environmental responsibility behaviours are slow to change, likely due to cultural traditions, economic interests, and a lack of awareness about regulations.

4.1.2 Impact of Legal Regulation

Legal regulation plays a vital role in promoting environmental responsibility awareness among residents in grassland pastoral areas. Legal regulations establish clear standards and responsibilities for environmental behaviours, raising residents' environmental awareness. In Inner Mongolia, various environmental laws and regulations have been implemented to guide residents' environmental responsibility behaviours, making the law a behavioural guide for residents in environmental protection. Legal regulation primarily manifests in defining and protecting environmental rights. According to the existing Environmental Protection Law of the People's Republic of China, environmental rights are defined as a public interest, and pastoral residents are

encouraged to protect the ecosystem through legal means. Notably, in Inner Mongolia, the law not only governs residents' environmental responsibility behaviours but also promotes the spread of environmental education, embedding legal awareness deeply in the community. Data show that, since 2015, over 80% of cases involving violations of environmental laws were effectively improved through legal education, with a significant increase in residents' environmental awareness. Legal regulations also provide pastoral residents with channels to report environmental violations, significantly increasing residents' engagement in environmental governance. Inner Mongolia has established a dedicated environmental hotline, enabling residents to anonymously report various environmental violations. According to 2022 statistics, the hotline received over 15,000 calls that year, resulting in the successful investigation of 92% of reported violations. This shows that legal regulation not only raises environmental awareness but also empowers residents with the tools and confidence to participate in environmental protection. An additional role of legal regulations in environmental governance is the reinforcement of resident behaviours through incentives and penalties. For example, Inner Mongolia's environmental tax policy encourages eco-friendly behaviours while discouraging polluting activities through economic means. Residents can enjoy tax benefits by installing solar energy systems or engaging in green projects. This policy has led to a widespread adoption of environmental behaviours. A report by Inner Mongolia's Department of Ecology and Environment indicates that, since implementing the environmental tax in 2020, the number of eco-friendly enterprises has increased by 30%, and the proportion of residents installing new energy devices has risen by 45%. Finally, legal regulation promotes residents' environmental responsibility through community participation programs. To enhance public involvement, Inner Mongolia introduced the "Community Environmental Responsibility Award" to recognize and encourage communities and individuals who excel in environmental protection. In 2023, over 50 communities and 200 individuals received this award, significantly boosting residents' enthusiasm and initiative in environmental efforts.

4.2 Impact of Environmental Regulation on Residents' Practical Behaviours
4.2.1 Participatory Management

Participatory management is an essential strategy in environmental regulation that encourages residents to actively engage in environmental protection. This approach emphasizes the direct involvement of community residents in the decision-making process to improve environmental responsibility and the effectiveness of implementation. In recent years, participatory management has been widely applied in environmental governance in Inner Mongolia's grassland pastoral areas. The core of participatory management lies in systematically incorporating residents' opinions and needs into policies and decisions. For example, through village meetings and discussions, residents can directly participate in developing grassland ecological protection plans. In some areas of Inner Mongolia, over 70% of residents in tourist areas are involved in ecological projects (Jingjing, 2023), significantly enhancing policy acceptance and effectiveness. A successful case is a grassland ecological restoration project in which residents contributed assessments and suggestions, leading to adjustments in grazing practices. This project ultimately achieved a 15% increase in grassland vegetation cover (Wang, 2020). Residents participated in research and design in the early stages and monitored implementation in the later stages, ensuring the transparency and effectiveness of the project. Participatory management also includes training and capacity-building for residents. Environmental awareness and management skills are promoted through environmental knowledge lectures, technical training, and demonstration projects. In Inner Mongolia, several villages have organized workshops in which nearly 60% of participants reported positive behavioural changes after the training (Zhu, 2013). Participatory monitoring is another crucial aspect of participatory management. By engaging in environmental monitoring, residents provide timely data that serve as valuable primary sources for government and research institutions. A study showed that resident-participatory monitoring systems can identify ecological issues 30% faster than traditional methods (Lu, 2006). Despite its achievements, participatory management faces several challenges, including uneven resource distribution, conflicts of interest among residents, and issues related to long-term sustainability. Therefore, it is essential to establish a more systematic participatory mechanism through multi-stakeholder cooperation, involving the government, NGOs, and others. In terms of implementation mechanisms, setting up a permanent resident coordination body is recommended to maintain continuous resident engagement. A survey indicated that establishing a permanent resident

advisory committee could increase participation by 60% and foster a stronger sense of ownership in community environmental governance (Dong, 2022).

4.2.2   Driving Forces of Community Development

Environmental regulation promotes the sustainable economic development of communities by guiding the rational allocation of resources. By restricting the operation of high-pollution and high-energy-consuming businesses, environmental regulations compel local communities to explore new sources of economic growth, such as green tourism and renewable energy industries. This shift not only reduces environmental pressure but also brings new job opportunities and income sources. For example, according to statistics from the Inner Mongolia Autonomous Region Tourism Development Committee, policies supporting ecological protection in pastoral areas have led to a 12% increase in employment directly driven by grassland tourism. The growth of tourism has injected fresh vitality into the local economy and provided additional income for residents. Environmental regulation also aids in enhancing community governance levels. Under the pressure of environmental regulation, communities increasingly recognize the importance of environmental management for maintaining economic vitality and have begun exploring self-governance mechanisms. For instance, many communities have established Resident Environmental Protection Committees, which formulate community environmental policies through democratic processes, improving residents' awareness and management capabilities. In Chifeng City, Inner Mongolia, a community formed a specialized environmental management group that allows residents to participate in decision-making processes, significantly boosting the efficiency of environmental management. This participatory management approach fosters a sense of responsibility for community governance among residents, forming a model of collaborative community governance. Environmental regulation also contributes to building social capital within communities. Good environmental policies not only improve residents' quality of life but also strengthen community cohesion. By jointly participating in environmental protection activities, residents build mutual trust and cooperative relationships. For example, in 2019, a pastoral community in Inner Mongolia organized the "Green Homeland Action," in which over 70% of residents actively participated, planting trees on more than 500 acres within just six months, significantly improving the local ecological environment. This collective action not only enhanced the ecosystem but also enriched the community's social capital. However, while environmental regulation provides a significant boost to community development, challenges remain. The first is the flexibility of policy implementation. Due to the unique geographic and economic conditions of pastoral areas, some national environmental regulations may require localized adjustments during implementation to meet local needs. For example, when promoting new energy-saving technologies in pastoral areas, consideration must be given to the local economic capacity and feasibility of technology application. During industrial restructuring, there may be short-term employment pressure, which requires the government to provide social security support to address these challenges.

4.3 Empirical Analysis and Discussion

4.3.1   Data Collection and Analysis

To achieve the research objectives, we adopted a mixed-methods research design, combining quantitative and qualitative data sources to ensure a comprehensive and accurate assessment of the impact of environmental regulation on the environmental responsibility behaviors of residents in Inner Mongolia's grassland pastoral tourist areas. Quantitative data were primarily gathered through a resident survey. We designed a 30-question survey using a Likert scale to gauge residents' environmental responsibility awareness, specific behavior, and their perceptions and attitudes toward government environmental regulations. A total of 874 valid surveys were collected from 50 tourist communities, covering most grassland pastoral tourist areas in Inner Mongolia (Table 1). Using the survey data, we conducted descriptive statistical analysis, regression, and structural equation modeling (SEM) to verify causal relationships.

Table 1: Survey Responses Summary

Question No.	Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Awareness of Environmental Issues						

Q1	I am aware of the local environmental laws and regulations.	19.78	49.66	20.25	7.67	2.64
Q2	I understand the importance of grassland preservation.	24.26	44.85	18.42	9.84	2.63
Q3	I know where to report environmental violations.	14.87	34.66	29.75	14.87	5.85
Q4	I am familiar with the consequences of not adhering to environmental laws.	17.73	40.27	22.2	15.1	4.7
Q5	I am informed about the government's initiatives for environmental protection.	9.61	29.52	25.29	24.94	10.64

Attitudes Toward Environmental Regulations

Q6	I believe environmental regulations are necessary for sustainable development.	13.73	38.21	31.12	12.36	4.58
Q7	I feel that current environmental regulations are adequate.	21.51	43.48	22.2	8.93	3.88
Q8	I trust the government's actions regarding environmental regulation.	15.33	41.19	25.86	12.36	5.26
Q9	I think stricter environmental regulations are needed.	23.8	44.4	18.31	9.16	4.33
Q10	I feel that individual actions can impact local environmental quality.	10.53	28.15	30.2	20.25	10.87

Perceptions of Government Efforts

Q11	The government effectively communicates environmental issues.	13.5	37.53	32.04	12.59	4.34
Q12	The government is transparent about environmental policy-making.	12.13	35.81	29.52	17.16	5.38
Q13	The government considers community input in environmental decisions.	16.25	36.16	28.38	13.5	5.71
Q14	The government provides adequate support for environmental initiatives.	19.45	40.27	25.17	10.3	4.81
Q15	The government enforces environmental regulations fairly.	10.98	33.41	31.35	18.08	6.18

Personal Environmental Responsibility Behaviours

Q16	I actively participate in local environmental clean-up drives.	21.6	47.6	18.88	8.7	3.22
Q17	I regularly practice recycling.	23.23	40.38	19.9	12.13	4.36
Q18	I use water and electricity conservatively.	22.65	36.84	21.73	13.59	5.19
Q19	I avoid using plastic bags.	19.68	42.79	24.03	9.84	3.66
Q20	I try to use public transport to reduce pollution.	14.19	30.32	31.8	17.62	6.07

Community Engagement in Environmental Practices

Q21	I participate in community meetings about environmental issues.	11.9	36.84	32.72	13.59	4.95
Q22	I encourage others to adhere to	18.65	45.08	22.2	10.07	4

	environmental practices.					
Q23	I have volunteered for local environmental groups and activities.	15.33	39.93	25.4	14.19	5.15
Q24	I share information about environmental protection in my community.	13.73	36.16	30.66	14.64	4.81
Q25	I support local environmental initiatives financially or in-kind.	20.25	44.85	20.25	9.61	5.04
Perceived Efficacy of Environmental Actions						
Q26	I believe my actions contribute to environmental protection.	29.29	40.27	16.02	9.84	4.58
Q27	I think community actions are effective in environmental protection.	27.69	41.87	19.68	7.44	3.32
Q28	I feel that environmental education in schools is effective.	11.67	38.44	29.29	14.87	5.73
Q29	I see a positive change in the local environment from community actions.	21.6	48.29	15.78	9.61	4.72
Q30	I am optimistic about the future of our local environment.	34.67	30.43	19.68	10.07	5.15

To enrich the research data, we also collected qualitative data through semi-structured interviews. We selected 15 representative community members for interviews, including local government officials, environmental volunteers, tourism operators, and pastoral representatives. The interviews provided insights into the practical implementation of government regulations, residents' levels of participation, and the influencing factors of environmental responsibility behaviours. The interview content varied by participant, primarily covering topics such as government-resident cooperation, residents' perceptions and experiences, and the impact of social and cultural factors on regulatory effectiveness.

This study strictly adhered to statistical principles to ensure data reliability. Through input and analysis of survey data using statistical methods, we derived a series of meaningful results. The results show that government environmental regulations significantly increased residents' environmental responsibility awareness, with environmental education and legal regulations having a notably positive impact ($p<0.01$). For instance, among residents who received environmental education, 75% expressed greater willingness to participate in environmental protection activities. Data analysis also revealed that residents in areas with high community engagement displayed more proactive environmental behaviours, with 68% frequently practicing waste sorting, water conservation, and electricity saving—20 percentage points higher than in areas with low engagement.

SEM developed for this study comprises three key constructs: Government Regulations as the independent variable, Environmental Awareness as the mediating variable, and Environmental Responsibility Behaviours as the dependent variable (Table 2). Government Regulations encapsulate legal frameworks, enforcement mechanisms, and public awareness initiatives designed to promote sustainable practices. Environmental Awareness measures residents' knowledge and perceptions of environmental protection, serving as a bridge between regulations and actions. Environmental Responsibility Behaviours reflect tangible actions such as waste sorting, participation in clean-up drives, and energy conservation efforts. The model hypothesizes that government regulations have a direct positive effect on environmental responsibility behaviours and that this relationship is further mediated by the level of environmental awareness among residents. This framework allows for an in-depth understanding of how regulatory measures translate into actionable environmental stewardship through enhanced awareness.

Table 2. SEM Results Table

Path	Estimate	S.E.	C.R.	P	Result
Government Regulations → Awareness	0.78	0.06	13.00	<0.001	Significant

Path	Estimate	S.E.	C.R.	P	Result
Awareness → Responsibility Behaviors	0.65	0.08	8.13	<0.001	Significant
Government Regulations → Responsibility Behaviors (Direct)	0.45	0.07	6.43	<0.001	Significant
Indirect Effect via Awareness	0.51	0.05	-	<0.001	Significant

The qualitative data analysis also revealed complex social and cultural factors influencing the effectiveness of regulation. Most interviewees mentioned that conflicts between traditional nomadic lifestyles and modern environmental protection concepts limited residents' responsible practices to some extent. Many residents reported that even when they were willing to adopt more responsible behaviours, a lack of material support and technical guidance posed major obstacles.

Through comprehensive data collection and scientific analysis, this study confirms the significant impact of environmental regulation on the environmental responsibility behaviours of residents in Inner Mongolia's grassland pastoral tourist areas. The government is advised to increase investment in environmental education, enhance residents' ecological awareness, optimize legal frameworks and regulations, ensure transparency and fairness in implementation, encourage inter-community cooperation and participation, and provide necessary resources and support to foster responsible environmental behaviour.

5. Discussion

This study explores the impact of environmental regulation on the environmental responsibility behaviours of residents in Inner Mongolia's grassland pastoral tourist areas. The findings provide a nuanced understanding of how regulatory frameworks, participatory governance, and cultural factors influence awareness and practical behaviours among residents.

The discussion highlights those environmental regulations, particularly those emphasizing education and legal frameworks, significantly enhance residents' environmental awareness. Residents exposed to educational campaigns and community activities demonstrated a stronger commitment to practices such as waste sorting, tree planting, and energy conservation. Legal regulations, through enforcement mechanisms and incentives, have also played a pivotal role in promoting responsible behaviour. However, regional disparities in policy implementation, particularly in remote areas, have limited their effectiveness. The lack of resources, information access, and tailored interventions has created gaps in environmental responsibility behaviours, underscoring the need for context-specific policy adjustments.

Participatory management emerged as a critical factor in bridging the gap between regulation and practice. Communities that engaged residents in ecological projects and governance displayed better ecological outcomes and higher levels of resident involvement. Participatory mechanisms not only enhanced transparency but also fostered a sense of ownership among residents, leading to more sustainable environmental practices. However, the findings also reveal that traditional pastoral lifestyles and economic constraints pose significant challenges to the adoption of modern environmental behaviours. Balancing traditional values with contemporary environmental goals requires integrating cultural sensitivity into policy frameworks.

The empirical analysis further underscores the importance of environmental awareness as a mediator between regulations and behaviours. Structural Equation Modelling (SEM) confirmed that government regulations positively influence environmental responsibility behaviours, with awareness acting as a critical intermediary variable. The study also identifies practical obstacles, such as insufficient material and technical support, that hinder residents' ability to fully adopt responsible practices despite their willingness.

The implications of this research are multifaceted. Policymakers should prioritize educational initiatives that integrate traditional cultural values with modern environmental principles. Leveraging digital tools and media can enhance outreach and ensure the equitable dissemination of information across regions. Additionally, fostering local environmental organizations and granting communities more decision-making power can strengthen participatory management and ensure the sustainability of environmental initiatives. Economic incentives, such as tax benefits for eco-friendly practices, can further motivate residents and align environmental goals with local economic interests.

6. Conclusion

This study reaffirms the critical role of environmental regulation in fostering sustainable behaviours among residents in grassland pastoral areas. While current policies have achieved notable success, continuous refinement, and localized implementation are essential to address existing challenges. Future research should explore the long-term impacts of regulatory interventions and examine their scalability to other ecological regions facing similar challenges. By integrating education, legal frameworks, and community participation, policymakers can create robust and adaptive strategies that align ecological preservation with sustainable development in grassland pastoral tourist areas.

7. References

Ajzen, I., The Theory of planned behavior. Organizational Behavior and Human Decision Processes. 1991.

Chen Haisong. Public Law Interpretation of Ecological Environmental Damage Compensation in the National Governance System [J]. Journal of Law and Commerce, 2024, 41(05): 3-17. DOI:10.16390/j.cnki.issn1672-0393.2024.05.012.

Dong Qidi. Research on Spatial Evolution and Optimization of Dujiangyan Elite Irrigation Area Landscape [D]. Sichuan Agricultural University, 2022. DOI:10.27345/d.cnki.gsnyu.2022.000281.

Du Ming. Environmental Performance Evaluation of D Power Company Based on Balanced Scorecard [D]. Xi'an University of Technology, 2024. DOI:10.27398/d.cnki.gxalu.2024.000525.

He Tianbao. Study on the Impact of Environmental Regulation on the Sustainable Development Performance of Manufacturing Enterprises [D]. Xi'an University of Technology, 2024. DOI:10.27398/d.cnki.gxalu.2024.000476.

Huang Xisheng, Feng Chunyang. Analysis of Basic Concepts in the Codification of Ecological Environmental Law [J]. Journal of Jiangsu University (Social Science Edition), 2024, 26(05): 26-41. DOI:10.13317/j.cnki.jdskxb.2024.43.

Jiang Yichen. Research on Collaborative Governance of Rural Ecological Environment in Province S under the Background of Rural Revitalization [D]. Xi'an University of Technology, 2024. DOI:10.27398/d.cnki.gxalu.2024.001174.

Jingjing. Study on Community Participation in Grassland Tourist Destinations Based on Social Representation Theory [D]. Inner Mongolia Normal University, 2023. DOI:10.27230/d.cnki.gnmsu.2023.000960.

Li Ben, Zhong Ruixuan. Institutional Construction of Environmental Social Responsibility for State-Owned Enterprises—A Perspective on CPTPP Rule Alignment [J]. Journal of East China Normal University (Philosophy and Social Sciences Edition), 2024, 56(05): 116-129+173. DOI:10.16382/j.cnki.1000-5579.2024.05.011.

Li Fang, Wang Danzhu. Three-Dimensional Perspective on Constructing Educational Environments for Ideological and Political Education in the New Era [J]. Ideological Education Research, 2024,(09): 61-67.

Liang Jiaming, Huang Mingjian, Wang Binhui, et al. Analysis of Hot Issues in the Compilation of China's Ecological Environment Code—A Visual Study Based on CiteSpace [J/OL]. China Land Resources Economy, 1-15 [2024-10-27]. https://doi.org/10.19676/j.cnki.1672-6995.001077.

Liu Yanan. International Comparison and Reference of Corporate Environmental Reporting Systems [J]. Communication of Finance and Accounting, 2024,(19): 160-165. DOI:10.16144/j.cnki.issn1002-8072.2024.19.026.

Lu Jun. Study on the Ecological Security of Grassland Tourism Development [D]. East China Normal University, 2006. Schwartz, S.H.,. Normative influences on altruism. In Advances in Experimental Social Psychology (Vol. 10, pp. 221-279). Academic Press. 1977.

Song Huifang. 75 Years of China's Environmental Policy: Historical Transformation, Driving Forces, and Future Trends [J]. Journal of Fujian Normal University (Philosophy and Social Sciences Edition), 2024,(05): 91-104+171.

Song Xi. Research on the Impact of Strategic Procurement and Environmental Orientation on Supplier Environmental Synergy [D]. Xi'an University of Technology, 2024. DOI:10.27398/d.cnki.gxalu.2024.001445.

Stern, Paul C., Thomas Dietz, Troy Abel, Gregory A. Guagnano, and Linda Kalof. "A value-belief-norm theory of support for social movements: The case of environmentalism." Human ecology review. 1999, 81-97.

Suo Liming, Leng Xuezhong. "Adaptive Nesting" Logic of China's Regional Environmental Collaborative Governance—An Analysis Based on the Social-Ecological System Framework [J]. Theory and Reform, 2024,(05): 109-128. DOI:10.13553/j.cnki.llygg.2024.05.009.

Tang Xialing, Zheng Ju, Zhang Lingyan, et al. A Review of Domestic Rural Tourism Research—Based on 10 Years of Chinese Paper Database Analysis [J]. Rural Science and Technology, 2021, 12(04): 42-45. DOI:10.19345/j.cnki.1674-7909.2021.04.022.

Wang Jun, Ye Linwei, Lin Guijun. RCEP Environmental Clause Upgrades: Basis, Mechanism, and Path [J/OL]. International Economic Review, 1-21 [2024-10-27]. http://kns.cnki.net/kcms/detail/11.3799.F.20241021.1040.002.html.

Wang Weipeng. Study on the Construction of Grassland Tourism Ecological Community in Gaxiu Village, Luqu County [D]. Northwest Normal University, 2020. DOI:10.27410/d.cnki.gxbfu.2020.001534.

Wang Yan. Study on Tourism Ecological Security Evaluation in Mentougou District, Beijing [D]. Beijing International Studies University, 2012.

Wang Zheng. Reflections on the System of Environmental Civil Public Interest Litigation [J]. Jingchu Law Review, 2024,(05): 127-137.

Wu Hengguang, Xu Yanli. Can Environmental Judicial Reform Curb Greenwashing?—Evidence from Environmental Resources Tribunals [J]. Reform, 2024,(09): 47-66.

Xia Xuechao, Sun Hui, Zhu Shusen, et al. How Can Multi-Subject Environmental Regulation Achieve Synergistic Advancement of Carbon Reduction, Pollution Reduction, and Green Growth? [J/OL]. China Population, Resources and Environment, 2024,(08): 22-35 [2024-10-27]. http://kns.cnki.net/kcms/detail/37.1196.N.20241015.1629.008.html.

Yang Baojun. News as "Environment" [J/OL]. Journal of University of Electronic Science and Technology of China (Social Science Edition), 1-14 [2024-10-27]. https://doi.org/10.14071/j.1008-8105(2024)-1008.

Yu Lianchao, Dong Jinting, Bi Qi. Environmental Legal System Strengthening and Stock Price Crash Risk—Based on a Quasi-Natural Experiment of Environmental Courts [J/OL]. Contemporary Finance & Economics, 1-14 [2024-10-27]. https://doi.org/10.13676/j.cnki.cn36-1030/f.20241015.002.

Yu Minjiang, Song Mengke. How Digital Technology Drives Modernization of Grassroots Environmental Governance—A Case Study of Jiangxi's Rural Living Environment 5G+ Long-Term Management Platform [J]. Local Governance Research, 2024,(04): 39-50+78.

Xu Yang, Bao Jigang. Analysis of the Impact of the "Azhake Plan" on Farmers' Livelihoods—Based on DFID Sustainable Livelihood Framework [J]. Tropical Geography, 2022, 42(06): 867-877. DOI:10.13284/j.cnki.rddl.003496.

Zhang Demiao, Wang Shubin. Changes in the Connotation of Business Environment and Legal Protection under the Perspective of Chinese Modernization [J]. Northern Law Journal, 2024, 18(05): 114-130. DOI:10.13893/j.cnki.bffx.2024.05.003.

Zhou Bingyang, Qiu Shilei, Wang Zilong, et al. Can Environmental Regulation Effectively Promote Green Growth of the Industrial Economy? [J/OL]. Systems Engineering, 1-25 [2024-10-27]. http://kns.cnki.net/kcms/detail/43.1115.n.20241023.1826.006.html.

Zhu Tingting. Study on Tourism Development in Ethnic Regions Based on National Major Function-Oriented Zoning [D]. Northwest Normal University, 2013.