From Tradition to Modernization: Research on Green and Low-carbon Development Path of Inner Mongolia Pastoral Area*

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Abstract

A thorough understanding of the "production-living-ecology" coordinated development mechanism in pastoral regions is crucial for achieving regional economic growth, improving living standards, and protecting the ecological environment. This study, from the perspective of green and low-carbon development, comprehensively evaluates the coordination level and coupling index of "production-living-ecology" in 14 border pastoral banners of Inner Mongolia, while analyzing their dynamic trends. Building on existing research findings, the paper proposes policy recommendations to effectively address the root causes of conflicts in this tripartite system and promote green, low-carbon transitions in production and lifestyle practices.

Keywords: "Production-Living-Ecology"; Coordinated Development Index; Coordinated Coupling Index

The No.1 Central Document of China in 2025 clearly states that "to achieve Chinese-style modernization, it is essential to accelerate the comprehensive revitalization of rural areas." The Inner Mongolia pastoral region is the largest pastoral area in China, covering 27.34% of the country's total pastoral area, serving as a crucial ecological security barrier. It supports the livelihoods of herders and is a typical region requiring coordinated efforts to balance ecological protection and economic development. The "production-living-ecology" triad in the Inner Mongolia pastoral region exhibits close connections and mutual influences. Specifically, pastoral production activities are primarily livestock-based, and the development of animal husbandry directly depends on the grassland ecosystem. Meanwhile, as the foundation for herders' survival, the ecological condition of the grasslands directly impacts their quality of life and production efficiency. In terms of lifestyle, the pastoral herders' way of life is closely tied to the grassland ecosystem. Traditional nomadic practices have fostered deep emotional bonds between herders and the grasslands, while modern lifestyles are gradually integrating into pastoral life. However, both traditional and modern lifestyles must be conducted under the premise of protecting the grassland ecosystem. Therefore, how to ensure the quality of life for herders while minimizing damage to the grassland ecosystem remains a critical challenge for the green and low-carbon development of the Inner Mongolia pastoral region. This study focuses on analyzing the intrinsic connections between the "production-living-ecology" triad in the pastoral region and conducts quantitative analysis through relevant indicator systems, aiming to provide theoretical support and decision-making references for promoting the coordinated and symbiotic development of "production-living-ecology" in the pastoral region under the "dual carbon" goals.

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1. Theoretical analysis and research hypothesis

The three dimensions of "production-living-ecology" essentially mean to correctly handle the relationship between the three, solve the development problems, achieve the value goals of resource conservation and environmental protection, and realize the symbiosis between production, life and natural ecology.

1.1. "Production-Living-Ecology" cycle

The relationship between "production-living-ecology" creates a virtuous cycle where productivity growth and improved living standards drive ecological conservation. However, this progress often comes at the expense of environmental degradation. In pastoral grassland ecosystems, this dynamic manifests as a vicious cycle: Governments adopt extensive mining strategies to fuel economic growth, while herders expand livestock populations to enhance livelihoods. Bao et al., (2024) pointed out that the prolonged exploitation of mineral resources and population expansion have caused severe ecological collapse and pollution. The resulting environmental damage further hampers productivity growth and living standards improvements. Consequently, a destructive cycle of mutual destruction emerges among production activities, livelihood demands, and ecological protection. Conversely, Zhou et al., (2024) by analyzing the coupling and coordination degree of the agro-pastoral transitional regions in Inner Mongolia, it is evident that promoting the harmonious and sustainable development of living, production, and ecological functions is crucial for achieving regional sustainability. Effectively balancing these three elements to achieve a sustainable "production-living-ecology" cycle could unlock the potential for long-term ecological resilience in pastoral regions.

1.2. Carbon cycle

The carbon cycle involves the collaborative mechanisms of producers, consumers, and decomposers to maintain the interactions between living and non-living elements in grassland ecosystems. The "human-grass-livestock-soil-atmosphere" carbon cycle regulates critical aspects including atmospheric conditions, grassland structure, soil nutrients, microbial communities, and livestock distribution. Firstly, based on long-term grazing experience, herders provide food resources and energy security for livestock while enhancing grassland carbon sequestration through seasonal supplementary feeding and rotational grazing. Secondly, the structural characteristics of grasslands and vegetation diversity serve as key factors in livestock energy supply. Soil microorganisms influence grass growth through multiple direct and indirect pathways, while grasses improve soil properties and microbial composition via root growth, secretions, and litter, thereby enhancing ecosystem stability and carbon sequestration. Thirdly, selective grazing, trampling, and manure return by livestock like cattle and sheep reshape grassland structures and microbial communities, directly or indirectly affecting grass regeneration capacity to maintain the grassland system's balanced mechanisms. Thus, pastoral grasslands function as "carbon reservoirs" through herders, soil, and livestock, fulfilling their ecological carbon sequestration role.

2. Research Design

2.1. Study area

Fourteen pastoral banner counties along the border of Inner Mongolia, located in northern China (Figure 1), serve as vital ecological security barriers and livestock production bases for the country. Their long-standing socio-economic development has been predominantly driven

by traditional animal husbandry, forming a distinctive regional "production-living-ecology" system with pronounced local characteristics. The study area experiences a temperate semi-arid continental climate characterized by scarce and highly variable precipitation, as well as intensive evaporation, rendering its ecosystem markedly fragile and sensitive. Table 1 (Statistical yearbooks of various autonomous regions and cities, 2023, para.2) presents baseline data across the three dimensions of "production-living-ecology" for each study unit, offering a quantitative foundation for analyzing human-environment interactions in the region.

In terms of ecological baseline, grasslands cover over 60% of the total land area in most pastoral banners, serving as the core component of the regional ecosystem. From a production perspective, a significant positive correlation exists between grassland area and livestock population, reflecting the high dependence of traditional pastoralism on grassland resources. However, prolonged overgrazing in some banners has led to grassland degradation and reduced vegetation coverage, further exacerbating ecological vulnerability. Regarding the demographic dimension, population distribution is highly uneven. Banners such as Siziwang, Urad Middle, and Darhan Maomingan United exhibit relatively large populations (each exceeding 100,000 inhabitants), indicating relatively stronger socio-economic carrying capacity. In contrast, sparsely populated banners like Ejin, Alxa Right, and New Barag Right (each with fewer than 40,000 residents) represent typical extensive territories with low population density.

Moreover, the study area spans a vast geographical extent—from the Hulunbuir grasslands in the east to the desert steppes of Alxa in the west—with topographical transitions from mountains and hills to plains and gobi deserts. This results in significant spatial heterogeneity in the structure and function of grassland ecosystems, providing a realistic basis for analyzing the coupling of the "production-living-ecology" system and regional variations in carbon cycle processes.

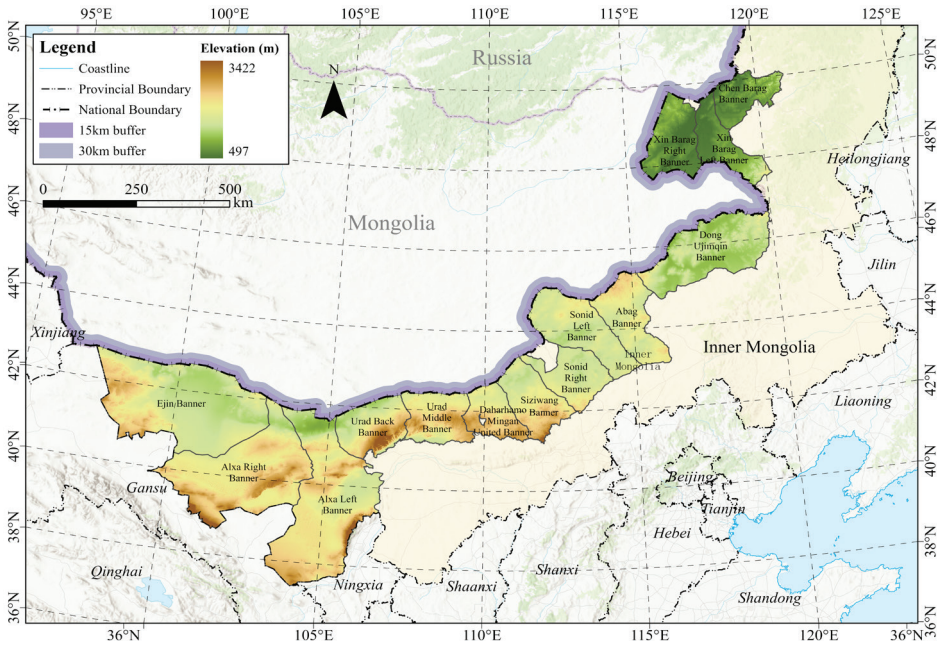

Figure 1. Location distribution of the study area

Table 1. Basic Information of "Production-Living-Ecology" in the Study Area

Pastoral Banner	Land area (10,000 km²)	Area of grasslands (10,000 km²)	Population (10,000)	Livestock count (10,000)
Xin Barag Right Banner	2.52	2.17	3.50	116
Xin Barag Left Banner	2.20	1.39	4.13	78
Chen Barag Banner	2.12	1.22	5.27	106
Abag Banner	2.75	2.48	4.26	168
Sonid Left Banner	3.45	3.35	3.40	118
Sonid Right Banner	2.67	1.95	6.51	106
Dong Ujimqin Banner	4.75	3.93	6.21	291
Siziwang Banner	2.55	2.14	20.47	144
Daharhamo Mingan United Banner	1.82	1.66	10.78	140
Urad Middle Banner	2.29	2.20	14.18	155
Urad Back Banner	2.50	2.43	5.82	46
Alxa Left Banner	8.04	4.60	13.33	59
Alxa Right Banner	7.30	3.19	2.50	15
Ejin Banner	11.46	0.69	1.95	13

2.2. Variable Description

2.2.1. Indicator Determination

Drawing on existing relevant literature, this study measures the "production-living-ecology" coordination index and coordination coupling index of 14 border pastoral banners in Inner Mongolia from 2018 to 2022 based on the "production-living-ecology" development level measurement index system of Inner Mongolia's pastoral grasslands, and provides an objective evaluation. In accordance with the design principles of the indicator system, the evaluation system is constructed from three aspects: the social production indicator system, the living indicator system, and the ecological indicator system, including 5 primary indicators and 12 secondary indicators. The relevant indicator data are sourced from the 2018-2022 editions of the "Inner Mongolia Statistical Yearbook"(Inner Mongolia Statistical Yearbook,2023,para.2), the "China Urban Statistical Yearbook"(China Urban Statistical Yearbook,2023,para.3), as well as the statistical yearbooks of various leagues and cities and the national economic and social development bulletins of various banners and counties (Statistical yearbooks of various autonomous regions and cities,2023,para.2).Missing indicators are supplemented using linear interpolation.

The specific indicators are shown in the table 2 below. The TOPSIS entropy weighting method is used to determine the weights, and then the comprehensive score is measured.

Table 2. The "Production-Living-Environment" Indicator System for Pastoral Areas

target system	Primary indicator	Secondary indicator	unit	Indicator type
Production Index System	Industry value level	Primary industry gross product	10,000 Yuan	positive
		Gross output of secondary industry	10,000 Yuan	positive
		Gross output of the tertiary industry	10,000 Yuan	positive
	Livestock output value level	production of meat	ton	positive
target system	**Primary indicator**	**Secondary indicator**	**unit**	**Indicator type**
Life Index System	health index	Health institutions per 10,000 population number of bed	Pieces	positive
	Basic material security	Per capita disposable income of herdsmen	10,000 Yuan	positive
		Total retail sales of consumer goods	Yuan	positive
		jobless rate	%	minus
		education spending	10,000 Yuan	minus
Ecological Index System	Environmental efficiency	Energy consumption per unit of GDP	Tons of standard coal/wan yuan	minus
		Nature reserve area	hectare	positive
		Vegetation (forest) coverage	%	positive

2.2.2. Relevant indicators

1. Production index system: Four indicators, including the added value of the primary, secondary and tertiary industries and the output level of meat in the output value of livestock products, are selected to represent the economic and social development level of the pastoral areas in Inner Mongolia.
2. The living index system: Through the selection of two perspectives of medical care and basic material security, and the selection of five indicators such as the number of medical and health institutions per 10,000 population, total retail sales of social consumer goods, the per capita disposable income level of herdsmen, unemployment rate and education expenditure for analysis, it reflects the comprehensive quality development of herdsmen indirectly.
3. Ecological indicator system: The ecological health status of pastoral areas is evaluated through three dimensions: energy consumption per unit of GDP, nature reserve area, and vegetation coverage.

2.3. Model Construction

To assess the overall situation of "production-living-ecology" low-carbon development in Inner Mongolia's pastoral regions, this study employs the TOPSIS entropy weighting method to comprehensively evaluate the low-carbon development levels of these three aspects. A coupling coordination model is constructed to investigate the coordinated development degree of 14 border pastoral banners in Inner Mongolia. Additionally, drawing on research by (Ma et al., 2018; Xie & Zhao, 2019; WU & Li, 2019; REN & DU, 2021), this papers propose classification criteria for the "production-living-ecology" coupling coordination degree in pastoral areas, as shown in the table 3 below:

Table 3. Coupling coordination degree classification criteria

Coordination range	Coordination level	Coordination range	Coordination level
$0<D\leq0.1$	Extreme	$0.5<D\leq0.6$	Compromise
$0.1<D\leq0.2$	major maladjustment	$0.6<D\leq0.7$	Primary coordination
$0.2<D\leq0.3$	Moderate imbalance	$0.7<D\leq0.8$	Moderate coordination
$0.3<D\leq0.4$	Mild imbalance	$0.8<D\leq0.9$	Good coordination
$0.4<D\leq0.5$	At risk	$0.9<D\leq1.0$	Quality Coordination

3. Empirical Results and Analysis

3.1. Comprehensive evaluation analysis

This paper constructs 5 first-level indicators and 12 second-level indicators, which are based on the actual situation of 14 pastoral banners in Inner Mongolia. However, each pastoral banner is faced with different ecological conditions such as extreme drought and desert grassland, which may become potential limiting factors and thus affect the accuracy of the index. Following the entropy method calculation approach, entropy weights for each secondary indicator were derived, with specific results shown in the table 4 below. Within the primary indicator system, the production development system holds the highest weight at 37.34% entropy weight, followed by the living development system at 32.06%, and then the ecological indicator system at 30.60%. At the secondary indicator level, the secondary and tertiary industries in the production sector demonstrate significant influence through their gross product levels, while the primary industry and meat production levels show relatively lower impact. In the living sector, the health index (number of hospital beds per 10,000 population) and basic material security (total retail sales of consumer goods) carry substantial weight, whereas education expenditure and unemployment rate exert limited influence. Regarding ecological development, energy consumption per unit of GDP carries minimal weight, while nature reserve area demonstrates a higher ecological impact.

Table 4. Weighting of Development Evaluation Indicators for 'Production-Living-Ecology' in 14 Border Pure Pastoral Banners of Inner Mongolia

Three Lives System	Primary indicator	Secondary indicator	Entropy Weight (%)
Production Index System	Industry value level	Primary industry gross product	5.09
		Gross output of secondary industry	12.62
		Gross output of the tertiary industry	14.59
	Livestock output value level	production of meat	5.04
Life Index System	health index	Health institutions per 10,000 population number of bed	10.90
	Basic material security	Per capita disposable income of herdsmen	4.03
		Total retail sales of consumer goods	12.62
		jobless rate	3.30
		education spending	1.21
Ecological Index System	Environmental efficiency	Energy consumption per unit of GDP	1.25
		Nature reserve area	21.18
		Vegetation (forest) coverage	8.17

Overall, with results shown in the table 5 below, the "production-living-ecology" development composite scores of Inner Mongolia's 14 pastoral border counties from 2018 to 2022 showed a sustained upward trend. Regarding regional disparities, the average composite scores between 2018 and 2022 revealed that Xinbaerhu Right Banner in eastern Inner Mongolia's pastoral border region scored 0.5382, ranking first, followed by Xinbaerhu Left Banner with 0.5233—both exceeding the regional average. In contrast, Ejina Banner and Alxa Right Banner in western border areas recorded the lowest scores at 0.1701 and 0.2756 respectively, which were merely about one-third of the eastern leading pastoral counties' scores.

Analyzing the time trend, the comprehensive score of Darhan-Mongol United Banner rose from 0.4930 in 2018 to 0.5133 in 2022, with an average annual growth rate of 0.82%. Similarly, Siziwang Banner's score increased from 0.2667 in 2018 to 0.3065 in 2022, achieving an average annual growth rate of 2.27%. In the eastern Mongolian region, Chenbaerhu Banner and Xinbaerhu Left Banner demonstrated higher scores and faster growth rates. Chenbaerhu Banner's score climbed from 0.4357 in 2018 to 0.4870 in 2022, with an average annual growth rate of 2.11%, while Xinbaerhu Left Banner's score rose from 0.5115 to 0.5371, maintaining an average annual growth rate of 1.37%.

Table 5. Comprehensive Sustainability Scores of 'Production-Living-Ecology' Development in 14 Border Pastoral Counties of Inner Mongolia

Pastoral Banner	2018	2019	2020	2021	2022	mean
Xin Barag Right Banner	0.5323	0.5513	0.5377	0.5382	0.5315	0.5382
Xin Barag Left Banner	0.5115	0.5149	0.5245	0.5286	0.5371	0.5233
Chen Barag Banner	0.4357	0.4429	0.4407	0.4623	0.4870	0.4537
Abag Banner	0.2843	0.2778	0.2870	0.3056	0.3170	0.2943
Sonid Left Banner	0.2472	0.2328	0.2344	0.2340	0.2453	0.2387
Sonid Right Banner	0.2727	0.2529	0.2502	0.2593	0.2724	0.2615
Dong Ujimqin Banner	0.4206	0.4006	0.4051	0.4119	0.4169	0.4110
Siziwang Banner	0.2667	0.2761	0.2844	0.2831	0.3065	0.2834
Daharhamo Mingan United Banner	0.4930	0.4812	0.4855	0.4928	0.5133	0.4932
Urad Middle Banner	0.2917	0.3013	0.3105	0.3152	0.3218	0.3081
Urad Back Banner	0.2562	0.2739	0.2744	0.2858	0.3143	0.2809
Alxa Left Banner	0.2408	0.2756	0.2268	0.2670	0.2019	0.2424
Alxa Right Banner	0.2190	0.2222	0.3136	0.3008	0.3224	0.2756
Ejin Banner	0.1670	0.1724	0.1734	0.1640	0.1738	0.1701

3.2. Coupling Coordination Level Analysis

The status of high-quality economic development can be evaluated from both macro perspectives and various subsystem dimensions, while the coordination among subsystems reflects the development level of "production-living-ecology", with results shown in the table 6. The coupling coordination degree model was subsequently applied to analyze the three-dimensional coupling coordination of "production-living-ecology" in 14 border pastoral banners of Inner Mongolia. The calculation results are shown in the table below. Except for Chenbaerhu Banner, all pastoral banners demonstrate an increasing trend in coupling coordination. Overall, the coupling coordination level of "production-living-ecology" development in Inner Mongolia's 14 border pastoral banners remains relatively low. Regionally, according to the coupling coordination degree classification criteria, Xinbaerhu Right Banner achieved the highest coordination level with a 2022 coupling degree of 0.6650 (primary coordination), while Alxa Right Banner recorded the lowest at 0.2490 (moderate discoordination). Between 2018 and 2022, Wulate Rear Banner transitioned from near discoordination to barely coordinated, while Siziwang Banner shifted from barely coordinated to primary coordination. Notably, Alxa Right Banner, Alxa Left Banner, and Ejina Banner still exhibit relatively low coupling coordination levels, indicating significant room for improvement.

Table 6. Inter-system coupling coordination degree of 14 border pure pastoral banners in Inner Mongolia

Pastoral Banner	2018	2019	2020	2021	2022
Xin Barag Right Banner	0.6542	0.6483	0.6565	0.6625	0.6650
Xin Barag Left Banner	0.5533	0.5560	0.5575	0.5675	0.5732
Chen Barag Banner	0.5143	0.5295	0.5223	0.5465	0.5207
Abag Banner	0.5321	0.5205	0.5366	0.5718	0.5895
Sonid Left Banner	0.4193	0.4026	0.4045	0.4002	0.4139
Sonid Right Banner	0.4436	0.4270	0.4225	0.4345	0.4469
Dong Ujimqin Banner	0.6227	0.5946	0.5980	0.6086	0.6097
Siziwang Banner	0.5727	0.5833	0.5922	0.5899	0.6112
Daharhamo Mingan United Banner	0.5759	0.5497	0.5573	0.5706	0.5970
Urad Middle Banner	0.5797	0.5819	0.5860	0.5818	0.5947
Urad Back Banner	0.4252	0.4588	0.4595	0.4779	0.5123
Alxa Left Banner	0.2447	0.2716	0.2190	0.2746	0.2606
Alxa Right Banner	0.2243	0.2346	0.1994	0.1999	0.2490
Ejin Banner	0.3991	0.3059	0.3357	0.3251	0.3315

4. Conclusions and Implications

This study measured the development levels of "production-living-ecology" in 14 border pastoral counties of Inner Mongolia from 2018 to 2022, yielding the following key conclusions: (1) The entropy method constructed an evaluation index system to assess low-carbon development in Inner Mongolia's pastoral regions. Analysis revealed that the comprehensive scores of these 14 border pastoral counties showed a sustained growth trend during the period. However, 9 pastoral counties maintained scores below 0.50, indicating relatively low overall development levels with significant regional disparities. (2) The coupling coordination degree model analyzed the three aspects of "production-living-ecology" in Inner Mongolia's pastoral areas, revealing an overall upward trend in coordination. Xinbaerhu Right Banner, Xinbaerhu Left Banner, Darhan Maoming'an United Banner, Siziwang Banner, and Dongwuzhumuqin Banner demonstrated higher coordination levels, while Alxa Left Banner, Alxa Right Banner, and Ejina Banner remained relatively low. This suggests that the varying coordination levels in pastoral regions may be attributed to abundant natural resources, continuous industrial upgrading, and prioritization of ecological conservation and green development.

Based on the research conclusions, this paper analyzes the policy implications of Inner Mongolia pastoral development from the following two aspects:

1. To effectively address the core issues in the "production-living-ecology" triad and achieve coordinated development across all three sectors. From the perspective of pastoral economic and social production, it is imperative to extend the livestock industry chain, resolve the mismatch between livestock production and market demands, and enhance production scale, product quality, and market competitiveness to alleviate pressure on grassland ecosystems. Regarding pastoral livelihoods, continuous efforts should focus on improving residents' health standards and basic material security, strengthening

infrastructure connectivity in border counties, upgrading public service systems including elderly care and healthcare, promoting educational quality enhancement, and diversifying income sources. In ecological conservation, strict implementation of grass-livestock balance policies should be prioritized, while leveraging carbon trading markets to unlock ecological asset value and boost grassland carbon sequestration capacity. This will foster a virtuous cycle of intensive and efficient production, prosperous and sustainable living, and stable ecological development.

2. Actively promote the green and low-carbon transformation of production and lifestyle to create social conditions for grassland ecological restoration. Local governments in Inner Mongolia should formulate differentiated policies based on regional realities: In ecologically fragile eastern pastoral areas, prioritize strengthening ecological compensation mechanisms to harness grasslands 'carbon sequestration capabilities; in the central agro-pastoral transition zone, emphasize industrial chain extension and optimize industrial structures; in western desert grassland regions, focus on developing efficient water-saving specialty livestock industries to boost herders' productivity and income. Through this approach, establish a long-term mechanism for coordinated development of "production-living-ecology" to advance ecological conservation and low-carbon sustainable socio-economic development in pastoral areas.

Reference

Alxa League Bureau of Statistics. (2023). *Alxa League Statistical Yearbook* [Monograph].https://tjj.als.gov.cn/col/col3060/index.html.URL

Baotou Municipal Bureau of Statistics. (2023). *Baotou Statistical Yearbook* [Monograph].http://tjj.baotou.gov.cn/tjyw/tjsj/btstjjndsj/2023/indexch.htm.URL

Bayannur City Bureau of Statistics. (2023). *Bayannur City Statistical Yearbooк* [Monograph].http://tjj.bynr.gov.cn/tjjztzl/tjnj/index.html.URL

Bao, Y. S., Bao, F. L., & Gao, Y. J. (2024). *Reconsideration of Several Basic Issues in China's Pastoral Areas.Frontier*, (01):71-83.https://doi.org/10.14129/j.cnki.forwordposition.2024.01.002

China National Bureau of Statistics, Urban and Social Economic Survey Division. (2023). *China City Statistical Yearbook* [Monograph].Beijing: China Statistics Publishing House.https://cnki.istiz.org.cn/CSYDMirror/area/Yearbook/Single/N2024050590?z=D19.URL

Hulunbuir Municipal Bureau of Statistics. (2023). *Hulunbuir Statistical Yearbook* [Monograph].https://tjj.hlbe.gov.cn/News/show/1165268.html.URL

Ministry of Agriculture and Rural Affairs of the People's Republic of China.（2025, January 1) *Opinions of the CPC Central Committee and the State Council on Further Deepening Rural Reform and Solidly Promoting the Comprehensive Revitalization of the Countryside.* https://www.moa.gov.cn/ztzl/2025yhwj/zxgz_29966/202502/t20250224_6470398.htm.URL

Ma, L., Long, H. L., Ge, D. Q., Zhang, Y. N., & Tu, S. S. (2018). *China Rural Area Urban-Rural Coordinated Development and Rural Revitalization Pathways.Economic Geography,38(4)*; 37-44. https://doi.org/10.15957/j.cnki.jjdl.2018.04.005

Inner Mongolia Bureau of Statistics. (2023). *Inner Mongolia Statistical Yearbook* [Monograph]. Beijing : China Statistics Publishing House.https://tj.nmg.gov.cn/files_pub/content/PAGEPACK/7f2e427b72bc45ec84f1773389947068/zk/indexce.htm.URL

Ulanqab Municipal Bureau of Statistics. (2023). *Ulanqab Statistical Yearbook* [Monograph].https://www.wulanchabu.gov.cn/tjnj/1457847.html.URL

Ren, B. P., & Du,Y. X. (2021). *The Coupled Synergistic Relationship between Economic Growth, In-*

dustrial Development, and Ecological Environment in the Yellow River Basin.China Population, Resources and Environment, 31(02):119-129.https://kns.cnki.net/kcms2/article/abstract?v=hmNf6PfbaBs744ntwFJ1n40xkkQFfjkwtFRId0G7pEKRJLVyxtxPoKoDrC3H_uAMJfVj34Mmn7d7W24VzadkV9riP7i4O_9B3Nc1m6S5NTrp5d0diihg4icwnn-IjqvD7YX3y4DqA71aXyrGLFjaVEaRhMdNyuV-gUm45evBP-V03Llq1mAcsYONrCxhYclT&uniplatform=NZKPT&language=CHS.URL

Wu, X. J., & Li, T. S. (*2019). Research on the Agglomeration and Synergistic Development of Rural Population, Economy, and Land Space in the Context of Rural Revitalization: A Case Study of Henan Province.Hubei Social Sciences,(6)*:61-69.https://doi.org/10.13660/j.cnki.42-1112/c.015106

Xilingol League Bureau of Statistics. (2023). Xilingol League Statistical Yearbook [Monograph].https://tjj.xlgl.gov.cn/tjj/tjyw/tjsj/yqsc/index.html.URL

Xie, X. J., Zhang, N., & Zhao, Z. X. (2019). *The Synergistic Development of Rural Production, Living, and Ecology (the 'Three Lives') Under the Green Growth Strategy.Environmental Economics Research,4(04)*:78-95. https://doi.org/10.19511/j.cnki.jee.2019.04.006

Zhou, H. T.,Wu, X. D., Nie, H. X., Wang, X. C. Y., & Zang, S. Y. (2024). *Coupling coordination analysis and obstacle factors identification of rural living-production-ecological functions in a farming-pastoral ecotone.Ecological Indicators*,158,111398-. https://doi.org/10.1016/J.ECOLIND.2023.111398.