

New Urbanization: Urban-Rural Coordination and Sustainable Development

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1. Introduction

In the context of sweeping shifts in global urban configurations and the broad advancement of Chinese modernization, new urbanization has emerged as a defining strategy for guiding high-quality development across urban and rural areas alike. The traditional urbanization model, oriented primarily toward expanding the physical scale of cities, has over time produced a set of interrelated practical challenges, including growing disparities in urban-rural development, restricted circulation of production factors, uneven access to public services, and deepening tensions between ecological protection and economic growth. Against this backdrop, promoting coordinated urban-rural development and embedding the principles of comprehensive sustainability have become shared imperatives in urban planning, regional governance, and urban-rural research worldwide.

Urban-rural integration forms the conceptual core of new urbanization, while sustainable development functions as the overarching principle threading through every stage of urban-rural construction. At present, China's urbanization trajectory has formally entered a phase characterized by quality improvement and efficiency enhancement, and cultivating a new model of urban-rural relations that combines industry-agriculture complementarity, integrated urban-rural development, and all-round regional prosperity demands a thorough understanding of the interconnections, operational mechanisms, and practical approaches linking new urbanization, urban-rural coordination, and sustainable development. With the aim of showcasing the latest scholarly advances, frontier methodologies, and empirical outcomes in this domain, this journal has organized a Special Issue focused on New Urbanization: Urban-Rural Coordination and Sustainable Development.

This Special Issue adopts a multidisciplinary, multi-scale, and cross-regional research perspective, bringing together a collection of high-quality academic papers that cover multiple representative regions across China and extend to developing countries overseas. Methodologically, the studies integrate spatial analysis, big data technology, intelligent algorithms, mathematical modeling, and qualitative research, and collectively address key themes such as urban-rural spatial evolution, factor interactions, governance optimization, ecological trade-offs, and industrial synergy. The findings range from theoretical framework development and mechanism analysis to quantitative assessment, scenario simulation, and policy design, with the overall aim of providing theoretical foundations, technical tools, and practical references for advancing people-centered new urbanization, resolving urban-rural development challenges, and achieving sustainable development in China and beyond.



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2. Overview of Contributing Institutions and Authors

The issue brings together 13 papers in total, with authors affiliated with universities, research institutes, planning organizations, and government agencies both in China and abroad. The broad diversity of institutions and geographic coverage among contributors fully reflects the internationalized, interdisciplinary, and integrated industry–academia–research character of this field of inquiry. The institutions involved in this Special Issue fall into four main categories. The first and largest group consists of comprehensive public universities, namely Peking University, the Chinese Academy of Sciences, Harbin Institute of Technology, Sun Yat-sen University, Tongji University, Xi'an Jiaotong University, East China Normal University, Yunnan University, Henan University, Fuzhou University, Chang'an University, Guangdong University of Foreign Studies, Jiangsu University of Science and Technology, and Zhengzhou University of Light Industry. The second category comprises specialized colleges focused on differentiated urbanization pathways and regionally distinctive research problems. The third includes dedicated research platforms and key laboratories that conduct empirical analyses drawing on long-term locational observation and accumulated field data. The fourth covers government-affiliated bodies such as academies of social sciences and urban planning and design institutes, which carry out applied research grounded in front-line planning and management practice.

Research emphases differ meaningfully across these institutional types. University teams prioritize theoretical innovation, model construction, long-term spatiotemporal evolution analysis, and mechanism investigation, while research platforms concentrate on multi-source data integration, methodological iteration, and the development of quantitative evaluation frameworks. Government and planning institutions, for their part, place greater weight on translating findings into practice, refining policy instruments, and designing operational solutions. This coordinated effort across diverse institutional actors allows the Special Issue to balance theoretical depth, technical innovation, and practical relevance, together offering a comprehensive reflection of the current research landscape in new urbanization and urban-rural coordination.

3. Thematic Review of Core Research Topics and Findings

Drawing on the research directions, study areas, methodological approaches, and core findings of all included papers, the Special Issue organizes its contributions into five thematic clusters that are mutually connected and logically coherent, together forming an integrated research system.

3.1. Urban-Rural Spatial Morphology, Boundary Evolution, and Urban Expansion

Urban-rural spatial configuration represents the most tangible material expression of new urbanization, and the study of urban-rural boundary change, settlement evolution, and urban expansion patterns constitutes a classic strand of inquiry in this field.

Studies in this cluster focus on spatial restructuring within the ongoing process of dissolving the urban-rural dual structure. One study centered on Zhengzhou draws on three core dimensions of population, land, and function, and constructs an urban-rural fuzziness index to quantify the dynamics of urban-rural boundary change. Its findings confirm that urban-rural boundaries are undergoing sustained weakening overall, with functional urbanization and population mobility identified as the primary drivers of boundary blurring [Contribution 1]. The study further validates this index as an effective quantitative indicator for assessing urban-rural integration outcomes. Another study combines long-term time series data on land use, nighttime light, and points of interest to examine spatiotemporal trends in urban-rural spatial morphology, revealing a gradual transition from a mono-

centric agglomeration pattern toward a polycentric networked development structure [Contribution 2].

This cluster also incorporates a bibliometric analysis of the driving forces behind urban expansion, systematically tracing research hotspots, dominant methodologies, and contested issues in global urban expansion studies across several decades and clarifying the roles of core driving factors such as socioeconomic conditions, institutional policies, and the natural environment [Contribution 3]. A cross-national case study of Tanzania further examines the expansion characteristics, regional disparities, and driving mechanisms of urban-rural settlements in African countries, finding that socioeconomic factors exert considerably greater influence on settlement development than natural environmental factors, and in doing so enriches comparative research on urbanization spatial dynamics across countries at different stages of development. Taken together, this cluster clarifies the objective patterns governing urban-rural spatial evolution and provides a solid empirical basis for territorial spatial planning and urban layout optimization [Contribution 4].

3.2. Urban-Rural Integration Effects, Regional Heterogeneity, and Coupling with Demographic Structure

The ultimate goal of urban-rural integration is to narrow the urban-rural gap and advance toward common prosperity, while demographic structural change profoundly shapes urbanization processes at the county and regional levels, and together these concerns form a core research direction of this Special Issue.

An empirical study focused on Guangdong Province demonstrates that urban-rural integration significantly promotes urban spatial expansion and enhances regional economic vitality, yet this developmental effect exhibits pronounced regional heterogeneity, phased characteristics, temporal lag, and diminishing marginal returns. The study further notes that urban-rural integration does not automatically translate into improved levels of common prosperity, and that development pathways must be optimized in a differentiated, phased manner according to each region's development foundation [Contribution 5].

Addressing the challenges facing county-level urbanization, a study using Jilin Province as its case area investigates the coupling relationship among population shrinkage, population aging, and new urbanization. The findings confirm that population outflow and aging significantly undermine the quality of county-level urbanization development, with both factors exhibiting a strong negative correlation, thus providing an analytical basis for population-declining areas to overcome urbanization difficulties and stabilize urban-rural development patterns. Taken together, this cluster directly confronts the imbalances inherent in urban-rural development, accurately identifies the practical shortcomings of integration-oriented growth, and offers empirical support for the formulation of differentiated policies [Contribution 6].

3.3. Urban-Rural Collaborative Governance, Public Services, and Infrastructure Integration

The restricted flow of production factors and the uneven distribution of public services and infrastructure between urban and rural areas represent critical bottlenecks constraining coordinated urban-rural development, and collaborative governance together with shared facility construction have thus become key mechanisms for addressing these challenges.

A study of the Yangtze River Delta region approaches this from a collaborative governance perspective, employing grounded theory and multi-level coding methods to identify six core elements, namely policy planning capacity, public participation, social organization involvement, government information disclosure, supervision and evaluation, and implementation capacity. Drawing on these elements, the study constructs a theoretical framework for collaborative governance of urban-rural integration, enriches the broader theoretical system of collaborative governance, and offers practical reference for optimiz-

ing governance models in the Yangtze River Delta and analogous regions nationwide [Contribution 7].

In the infrastructure domain, another study introduces last-mile logistics spatial accessibility as a novel dimension for measuring urban-rural integration, and taking Guangzhou as its case area, it combines deep learning and graph neural network technologies for comprehensive assessment. The findings reveal that logistics accessibility is considerably stronger in urban core areas while peripheral rural zones still exhibit notable gaps, though overall facility levels across the entire territory show steady improvement, underscoring logistics network optimization as a meaningful indicator of urban-rural infrastructure integration. Additionally, a study focused on the Yangtze River Economic Belt examines socio-cultural coordinated development by assessing the spatial distribution of regional public services and cultural resources. It identifies a pronounced east-high west-low development gradient alongside considerable internal disparities and proposes optimization pathways centered on cultural industry development and the equalization of public services [Contribution 8].

3.4. Land-Use Functions, Ecological Trade-Off Coordination, and Watershed Ecological Compensation

The balance between land use, ecological protection, and urban-rural development constitutes a core issue in achieving sustainable development, and this cluster concentrates its inquiry on ecologically functional zones and watershed areas.

A study taking townships in the Funiu Mountain ecological function zone as its analytical unit constructs a land-use evaluation system grounded in the production-living-ecology framework, combining correlation analysis and geographically weighted regression to examine the spatiotemporal dynamics and trade-off/synergy relationships among land-use functions. The results reveal that ecological function holds a dominant position in the region, that production and living functions display a synergistic relationship with each other, while both stand in a trade-off relationship with ecological function. Pronounced spatial non-stationarity across different functional combinations further highlights systemic complexity, and these findings offer a scientific basis for spatial governance and resource allocation in townships within ecological function zones [Contribution 9].

A parallel study of the Fenhe River Basin applies the InVEST model to simulate urban-rural water supply service flows at multiple scales and investigate ecological compensation mechanisms, quantifying spatiotemporal mismatches in water resource supply and demand between upper and lower reaches, confirming that supply concentrates upstream while demand clusters downstream, and validating the effectiveness of water conservation policies and hydraulic engineering in mitigating this imbalance, thereby establishing a multi-scale analytical framework for ecological service flow analysis and ecological compensation research [Contribution 10]. Research on the middle and lower reaches of the Yellow River, meanwhile, focuses on the relationship between new urbanization and urban land green utilization efficiency, unpacking the complex influences of urbanization spatial association networks on green land use, distinguishing the differential effects of urbanization across various dimensions, and offering decision-making recommendations for efficient and ecologically sound land use in basin cities [Contribution 11].

3.5. Spatial Matching of Transportation, the Digital Economy, and Related Factors with Urban-Rural Development

Transportation networks, the digital economy, and the cultural tourism industry serve as vital forces for energizing urban-rural development and advancing industrial integration, and the degree of spatial matching among these factors directly shapes the effectiveness of coordinated urban-rural development.

A study of Yunnan Province integrates social media check-in big data with transportation network data, applying time-series network models and spatial autocorrelation methods to assess the spatial mismatch between transportation construction and tourism spatial vitality. The findings indicate that infrastructure conditions in certain areas have steadily improved while cultural tourism resource development lags considerably behind, producing an imbalance in which expanded road access fails to generate corresponding economic dynamism. The study thus clarifies that transportation investment must advance in tandem with industry cultivation and market development in order to fully unlock development potential [Contribution 12].

Shifting to a broader national scale, another study covering 287 cities across China systematically examines the spatiotemporal evolutionary patterns of the digital economy and green innovation, confirming that the digital economy exerts a significant promotional effect on green innovation and generates pronounced spatial spillover effects, with both factors exhibiting an overall east-high west-low spatial agglomeration structure. Together, these findings offer fresh perspectives for harnessing digital technology to drive urban-rural green transformation and build low-carbon sustainable development pathways [Contribution 13].

4. Conclusions and Prospects

The papers collected in this Special Issue draw on diverse geographic regions, research scales, and disciplinary perspectives to directly confront the practical challenges encountered in advancing new urbanization, and together they achieve an organic integration of theoretical exploration, methodological innovation, and practical application. Viewed as a whole, the contributions exhibit three distinctive characteristics. First, the research perspective is comprehensive in scope, moving beyond the conventional dualistic thinking that separates urban from rural and treating urban-rural systems as organic wholes for systematic analysis. Second, the methodological approaches are technically advanced, broadly incorporating multi-source big data, artificial intelligence, spatial econometrics, and simulation modeling, and in doing so pushing urban-rural research toward greater precision and quantitative rigor. Third, the research orientation is decidedly pragmatic, closely targeting the specific development challenges of different regions and putting forward tailored recommendations for planning, governance, and industrial development, with findings that carry strong potential for real-world application.

At the same time, we acknowledge that new urbanization, urban-rural coordination, and sustainable development constitute a long-term and inherently complex systemic undertaking, and considerable space for further inquiry remains in the current body of research. Future efforts should therefore continue to deepen exploration across five directions, encompassing deeper institutional and mechanism reform in support of urban-rural integration, the substantive application of digital governance and smart technologies in urban-rural settings, the construction of resilient urban-rural systems in response to climate change and extreme events, the development of cross-regional coordination mechanisms addressing benefit distribution and long-term governance, and comparative studies of urbanization pathways across different development models and economic contexts.

The publication of this Special Issue aims to provide a productive platform for scholarly exchange and to inspire deeper research engagement from academics in China and beyond, continuously enriching relevant theoretical frameworks, refining methodological tools, and consolidating practical experience in this field. The collected findings also aspire to offer meaningful reference for urban planners, regional administrators, and policymakers, supporting countries around the world in steadily advancing high-quality urbanization,

progressively narrowing the urban-rural development gap, and collectively moving toward a coordinated, green, and enduringly sustainable path of development.

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