

# Thoughts on Urbanology in the New Era: Urban Issues, Urban Science, and Urbanology

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**Abstract.** Establishing an urban science system led by urbanology has long been a shared pursuit among urban researchers. The aim has been to construct, from an academic standpoint, a theoretical and methodological framework for urbanology that can provide guiding ideas and professional knowledge for urban development and planning in China. China is now at a critical historical stage in advancing Chinese modernization. Urban development is an important engine of this process, and cities have entered a new phase of development; urbanology therefore requires systematic review and renewed reflection. By tracing the historical trajectory of urban development, this paper argues that urban development in China has consistently been reform-oriented, directed toward liberating and developing productive forces and implementing national development strategies. Compared with urbanology or urban science abroad, Chinese urbanology not only advocates interdisciplinary inquiry into the scientific laws underlying urban development, but also emphasizes close integration with the theory of productive forces, national macro-level policies, and urban institutional reform. This is the essential difference between Chinese urbanology and urbanology or urban science research overseas. On this basis, and in accordance with the requirements of the Third Plenary Session of the 20th CPC Central Committee, this paper focuses on improving the urbanization strategy and developing new quality productive forces. Building on existing research in urbanology, it explains the practical significance and core content of developing urbanology in the new era, and proposes a disciplinary system composed of six key fields of urban science under the leadership of new-era urbanology, with the aim of providing systematic and sustained scientific support for the construction of modern cities.

**Keywords:** urbanology; urban work; new quality productive forces; urban science; disciplinary system

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Since the beginning of reform and opening up, China has experienced the largest wave of urbanization in human history, accompanied by the rapid development of productive forces [1]. Cities have always occupied a pivotal position in the overall work of the Party and the state, and urban development has become an important engine of Chinese modernization. Given the comprehensiveness and complexity of urban work, Qian Xuesen [2], with strategic foresight, proposed establishing an urban science system led by urbanology, using Marxist philosophy and systems theory to guide the solution of complex urban problems. Since then, China has gradually developed dozens of professional fields bearing the name “urban,” such as urban economy, urban society, urban planning, urban transport, and urban management. Each field has gradually formed its own research directions, theoretical systems, technical methods, and practical domains [3]. Around the notion of “urbanology,” scholars have carried out sustained inquiry and produced a body of papers, monographs, and textbooks [4-5], attempting to build a theoretical and methodological system that could support China's rapid urbanization with professional knowledge.

Yet existing research in urbanology still needs improvement in both basic theory and disciplinary organization. First, compared with the achievements of China's urban development, foundational and systematic theoretical outputs in urbanology remain insufficient, revealing a clear contradiction: theoretical research in urbanology lags behind the development of urban practice. Second, compared with the rapid

advance of new technologies and methods, urbanology has produced too few pioneering and cross-disciplinary innovations; data- and technology-driven pathways for urban planning and governance remain to be further clarified. In addition, as the content and scope of urbanology continue to expand, more related disciplines have become involved. However, the cooperation and competition among subfields of urbanology often lack a unified goal or basic consensus, making it difficult to reflect the holistic and systemic core of urbanology. As a result, an urban science system with urbanology as its true leading field and with a clear main-support structure has not yet taken shape.

For this reason, forty years after Qian Xuesen proposed the establishment of urbanology, it is necessary to review and rethink the field. In particular, on the basis of existing research in urbanology and in light of the reform direction of China's urban development institutions, this paper proposes building a disciplinary system led by urbanology in the new era and supported by different urban science fields. Such a system is intended to provide key theoretical support for the construction of modern cities and for systematically advancing urban work in the context of Chinese modernization.

## **1 Foundations for Building Urbanology in the New Era**

### **1.1 Formation and reform of institutions related to urban development in China**

In general terms, urbanization refers to the process by which, with the development of social productive forces, scientific and technological progress, and industrial restructuring in a country or region, production and living patterns gradually shift from a rural society to an urban society. It is manifested in the transformation of rural population into urban population and in the continuous development and improvement of cities [6]. In the early years of the People's Republic of China, the planned economy was regarded as an essential feature of the socialist system. The First Five-Year Plan, formulated under this premise, occupied a foundational position in the history of urban development in New China [7] and continued to influence urban development after reform and opening up, including the household registration system, land system, administrative system, and fiscal and taxation system. These institutional reforms not only affected concrete dimensions of urban development, such as the distribution of urban and rural populations, land use, industrial structure, and infrastructure construction, but also formed an overall methodological path: using reform to resolve the contradictions between original urban institutions and mechanisms and new development characteristics.

From 1953 onward, China accelerated its advance toward socialist industrialization and decided to implement the First Five-Year Plan, centered on heavy industrial construction. This marked the beginning of large-scale industrialization. With assistance from the Soviet Union, China designed 156① key industrial construction projects [8], classified cities into four categories, and adopted differentiated construction policies for different types of cities. To ensure the policy goal of prioritizing heavy industry and to prevent blind expansion of construction, the central government controlled the urbanization process through administrative divisions and the city-town establishment system. The household registration system, fiscal and taxation system, and social welfare system derived from this arrangement had far-reaching effects on China's later urbanization [9].

In addition to creating a model of urban development driven by industrial project construction, the First Five-Year Plan period also shaped institutional arrangements related to urban development. Key projects often included housing, education, medical care, and other livelihood service facilities, forming work-residence units centered on enterprises and social spaces of a certain scale - the so-called "work unit running society." In practice, the "scissors gap" between industrial and agricultural product prices provided funds for

industry; the land requisition system supplied land for industrial expansion; and labor recruitment was organized according to industrial project construction plans. The household registration system<sup>②</sup> managed the flow of rural population into cities, while household registration type affected access to grain supply, employment opportunities, education, housing, medical care, and social security benefits. Over time, this evolved into China's distinctive urban-rural dual structure during urbanization [10].

It was not until the Third Plenary Session of the 11th CPC Central Committee in 1978 that the focus of work was clearly shifted to socialist modernization, and the national policy of domestic reform and opening to the outside world began. In 1992, the 14th CPC National Congress explicitly proposed establishing a socialist market economy, powerfully promoting the transformation of China's basic economic system from a planned economy to a market economy. Economic system reform then affected reforms in urban institutions. For example: 1) open capital and labor markets allowed surplus rural labor and wealthier farmers to enter cities for residence and work, promoting household registration reform; 2) changes in the structure of the floating population and in economic and social forms generated demands for equalized basic public services, driving social security reform; 3) basic public services gradually expanded from coverage of registered urban residents to full coverage of the permanent resident population, involving reforms in central-local responsibilities and fiscal distribution; 4) economic system reform led to administrative system reform and the formation of the city-governing-county system, making Chinese municipal governments distinctive governments that coordinate urban and rural areas; 5) as urbanization entered its middle and later stages, China formed an overall urbanization pattern centered on urban agglomerations and coordinated development among large, medium-sized, and small cities as well as small towns, creating new demands for regional collaborative governance and institutional reform.

Promoting economic reform oriented toward an effective market and a capable government has at its core the liberation and development of productive forces. This has been the foundational factor enabling rapid urbanization after reform and opening up. China's permanent-resident urbanization rate rose from 17.9 percent in 1978 to 67.0 percent in 2024, marking entry into a stage dominated by urban society. In 2020, China achieved the goals of eliminating absolute poverty and building a moderately prosperous society in all respects, but it remains in a critical stage of improving the institutional mechanisms for integrated urban-rural development. The decision of the Third Plenary Session of the 20th CPC Central Committee emphasized that integrated urban-rural development is an inevitable requirement of Chinese modernization, and that the integration of urban and rural planning, construction, and governance should be comprehensively improved to further promote common prosperity and development in both urban and rural areas. Adhering to a people-centered approach, adapting to new changes in people's ways of living and producing, and building livable, business-friendly, safe, resilient, and smart cities are the future directions for cities in the new era. These issues also involve ecological and environmental protection and the improvement of urban environments. They constitute the necessary background for understanding China's urban development and grasping its laws.

## **1.2 Review and direction of urbanology research in China**

Soon after reform and opening up began, the State Council convened the Third National Urban Work Conference<sup>③</sup> in March 1978 (Table 1), once again emphasizing the important position and role of cities in the national economy. It stated that “cities are the centers of China's economy, politics, science, technology, culture, and education, and play a leading role in socialist modernization” [11]. Thereafter, urban construction across the country changed dramatically, and scholars began a series of urban-related scientific

studies from different professional perspectives, drawing on international experience in urban construction and development.

Qian Xuesen, an eminent Chinese scientist who made outstanding national contributions, proposed the idea of establishing urbanology on the basis of systems engineering theory, in view of the state of urban construction and the development trend of urban planning at that time [2]. He advocated research into an urban science system led by urbanology [12]. Qian argued that: 1) solving complex urban problems involves multiple disciplines and requires a leading guiding idea - urbanology. Urbanology studies the city itself; the city is a unity of change and continuity and must be guided by Marxist philosophy. With urbanology, urban development planning can have a sound basis. 2) Urbanology belongs to applied theoretical science. It is more theoretical than urban planning, yet compared with other natural and social sciences, it has a distinctive practical orientation; it therefore occupies an intermediate level. 3) Urbanology should not study only one city, but the urban system of a country. A system has structure, and the basic force shaping that structure is productive forces. It is necessary to consider what kind of productive forces will develop in the twenty-first century. 4) Urban problems must be studied through systems thinking; cities cannot be studied in isolation, for isolated elements do not constitute a system.

Qian Xuesen's proposal attracted strong attention and stimulated multiple studies, resulting in a group of papers, monographs, and textbooks. Representative works include the new-knowledge series Urbanology compiled by Jiang Meiqiu and others at Peking University [13], the graduate textbook Urbanology of Harbin Institute of Technology [14], and the graduate textbook Reader in Urban and Town Studies edited by Song Junling and others [15]. These works set out general principles and research contents of urbanology. The basic consensus they formed includes the following: 1) urbanology studies the city itself; guided by Marxist philosophy, it studies cities in relation to scientific and technological progress and the development of productive forces, and is the scientific theory of cities; 2) urbanology occupies an intermediate level between theoretical science and engineering technology, and research in such a science requires systems perspectives and methods; 3) an urban science system led by urbanology provides knowledge for studying and solving urban problems, and can offer scientific bases for many theoretical and practical issues in urban work, such as the laws of urban development, principles of urban planning, and the position and role of cities in national economic and social development.

These basic consensuses deepened China's understanding of urban development and of the complexity and systemic laws of cities [16-18], and became important ideas influencing urban work in China. In particular, shortly after the 18th CPC National Congress, China convened the Fourth Central Urban Work Conference, which explicitly stated that urban work is a systems engineering endeavor. Urban work must establish systems thinking. Urban development is a natural historical process with its own laws, and these laws must be understood, respected, and followed. The conference called for systematically advancing all dimensions of urban work through “one respect and five coordinations.” In April 2020, General Secretary Xi Jinping further stated that “improving the urbanization strategy” [19] was one of the major issues in the national medium- and long-term economic and social development strategy. These requirements for urban work in the new era are both concrete extensions of the holistic and systemic theoretical connotations of urbanology and new directions for deepening urbanology in the new era.

Table 1 Overview of the National (Central) Urban Work Conferences

| Conference                  | Time           | Main contents                                                                                                                                                                                                                                        |
|-----------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First Urban Work Conference | September 1962 | Clarified the coordinated relationships within industry and between industry and agriculture, and between cities and the countryside. Emphasized that every step of industrial adjustment should help strengthen industry's support for agriculture, |

|                              |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |               | expand light industry and handicrafts, strengthen mining and logging capacity, and meet urgent needs of national defense production.                                                                                                                                                                                                                                                                                                                |
| Second Urban Work Conference | October 1963  | Addressed excessively rapid urban population growth and insufficient supply of major daily necessities. Emphasized increasing production and practicing economy in all cities, expanding industrial production, supporting agricultural production, improving management, practicing diligence and frugality, arranging labor properly, coordinating proportional relations, continuing adjustment, and laying a foundation for future development. |
| Third Urban Work Conference  | March 1978    | Reaffirmed the leading role of cities in socialist modernization. Proposed establishing a rational urban system, following a planned development path, improving urban planning, and strengthening planning management.                                                                                                                                                                                                                             |
| Fourth Urban Work Conference | December 2015 | Focused on solving prominent problems such as urban diseases and improving the sustainability and livability of urban development. Emphasized the urban work approach of “one respect and five coordinations.”                                                                                                                                                                                                                                      |

## 2 Overseas Research on Urbanology and a Synthetic Review

Overseas research on urbanology can be traced to the 1910s. In *Cities in Evolution*, published in 1915, the British urban planner Patrick Geddes [20] proposed that urbanology is at once history, science, philosophy, art, and politics. Its focus is urban research required for the “path toward the new technological city,” involving the integration of existing disciplinary knowledge, in-depth analysis of urban problems, and exploration of urban character and spirit. In 1961, the American anthropologist and representative of neo-evolutionism Julian H. Steward [21] noted in a review in *Science* that urban research should focus on cities, and that urbanology could serve as scientific guidance for common problems and methods in studies of urban development. In the same year, “urbanology” was included as a proper term in Webster's Dictionary and defined as the study of problems specific to cities, such as planning, education, society, and politics. In 1966, Professor Isomura Eiichi of Tokyo Metropolitan University first proposed the creation of the discipline of urbanology at the 13th conference of the Japan Society for Urban Science, and renamed the society the Japan Society of Urbanology, with the aim of establishing “urbanology” to solve the lack of comprehensiveness in urban and regional research. In the revised 1965 edition of the *Encyclopedia of Urban Problems*, Isomura discussed the difference between urbanology and urban science, arguing that urbanology forms the central system of urban science but is not identical with urban science itself; urban science refers to sciences that take the city as their object, such as urban geography, urban economics, and urban sociology.

Since 2010, “urban science” has also often been regarded as a disciplinary domain that studies the nature of cities [22-23]. In recent years, technological progress has particularly advanced urban science. Michael Batty [24], a representative of the new urban science school, proposed the concept of “the new science of cities,” defining it as an urban science based on complexity theory and supported by new technologies and methods developed over the previous twenty to twenty-five years. It reflects discreteness, bottom-up thinking, and an evolutionary perspective. In 2021, Luís M. A. Bettencourt [25] of the University of Chicago proposed in *Introduction to Urban Science: Evidence and Theory of Cities as Complex Systems* that urban science is a novel and comprehensive discipline that treats cities as complex adaptive systems. Moreover, with the rapid development and application of digital technologies such as digital twins [26], large models [27], and embodied intelligence [28] in urban scenarios [29-30], learning from data, extracting urban scientific knowledge from that learning, and using scientific knowledge to drive planning analysis, modeling, and decision-making are becoming frontier directions in urban science and urban planning [31].

In summary, overseas urban research has mainly unfolded around “urbanology” or “urban science.” The former focuses on establishing basic theories for the systemic and complex character of cities, whereas the latter emphasizes the use of technical methods to study the causes and mechanisms of urban problems.

Compared with Chinese urbanology, research at home and abroad shares the same object - the city - and emphasizes understanding urban complexity from a systems perspective while advocating interdisciplinary inquiry into the scientific laws behind urban development. The difference is that overseas urbanology lacks a guiding philosophical framework, especially one centered on Marxist philosophy. It also does not closely integrate urbanology with the theory of productive forces, national macro policies, and urban institutional reform. This is the essential difference between Chinese urbanology and overseas urbanology research.

### **3 Marxist Theory of Productive Forces and Urban Development**

#### **3.1 Productive forces as the source of urban development**

Urban development and its laws can be studied from various theoretical perspectives. Urbanology in the new era takes Marxist theory on productive forces and relations of production as its core theory [32-33, 35]. It emphasizes that productive forces are the source of urban development, while relations of production determined by productive forces are the fundamental cause of urban development and systemic evolution [34]. This theoretical orientation continues the basic consensus of existing urbanology while better conforming to the long-term direction of socialist development. It can provide a more explanatory and consensus-based theoretical foundation for urbanization with Chinese characteristics.

Mao Zedong Thought emphasized that “our fundamental task has shifted from liberating productive forces to protecting and developing productive forces under new relations of production.” Deng Xiaoping Theory proposed that “socialism must first develop productive forces.” The important thought of the “Three Represents” states that the Communist Party of China has always represented the development requirements of China's advanced productive forces. The Scientific Outlook on Development particularly emphasized “further giving play to the major role of scientific and technological progress and innovation, and earnestly shifting economic and social development onto a people-centered, comprehensive, coordinated, and sustainable track.” All these constitute developments of Marx's theory of productive forces under socialism with Chinese characteristics.

China's experience of urban development shows that the theory of productive forces is closely related to urban development. It follows a transmission logic: productive forces determine relations of production; relations of production condition social organizational relations; social organizational relations form urban institutional arrangements; and urban institutional arrangements affect urban development. The direction of reform is to liberate and develop productive forces, and the fundamental goal is to improve people's well-being. The improvement of people's well-being, in turn, affects the direction of relations of production and jointly promotes social progress and development.

#### **3.2 New quality productive forces and future urban development**

In September 2023, General Secretary Xi Jinping first proposed the concept of new quality productive forces [36]. “Developing new quality productive forces” is a Chinese innovation in Marxist theory of productive forces. Since entering the new era, China has continuously liberated and developed social productive forces to promote high-quality development. It has proposed that “innovation is the primary driving force of development” and that “developing new quality productive forces is an inherent requirement and an important focus for promoting high-quality development,” thus further deepening the theory of productive forces. In particular, after the concept of “new quality productive forces” was put forward, urban development must pay special attention to advanced productive forces generated by revolutionary technological breakthroughs, innovative allocation of production factors, and deep industrial transformation and upgrading. New quality productive forces are advanced productive forces in which

innovation plays the leading role, which break away from traditional economic growth models and development paths of productive forces, possess high-technology, high-efficiency, and high-quality characteristics, and conform to the new development philosophy [36].

The relationship between new quality productive forces and urban development is essentially a dynamic process of “two-way empowerment.” First, as centers of economic and social activity, cities possess abundant resources such as human capital, capital, technology, and data, providing the material basis and supporting conditions necessary for the development of new quality productive forces. The scale and diversity of cities determine their large market demand, which provides broad market space for new quality productive forces and promotes their industrialization and commercialization. Urban development also facilitates the agglomeration of various factors, forming industrial clusters and innovation networks and improving the efficiency and synergy of factor allocation. Second, through policies, plans, and measures, municipal governments optimize the urban innovation environment, including strengthening intellectual property protection, improving policy systems for innovation and entrepreneurship, and building innovation platforms and carriers, thereby providing a favorable policy environment and institutional safeguards for new quality productive forces. Renewal of productive forces drives the upgrading of urban functions and the restructuring of urban space, while factor agglomeration and institutional innovation in cities provide the soil for leaps in productive forces. Future cities should formulate strategies according to local conditions and enhance overall competitiveness through regional coordination.

New quality productive forces provide a comprehensive and innovative account of the development of productive forces themselves. They are also the new qualitative driving force of future urban development and offer consistent theoretical grounds and guiding ideas for building urbanology in the new era [37]. This provides important theory for urbanology in the new era to reveal urban development and its laws and to guide future urban work.

## **4 Building Urbanology in the New Era and Its Disciplinary System**

### **4.1 Practical significance of building urbanology in the new era**

The new development stage marks China's transition from high-speed growth to high-quality development, and cities are shifting from extensive growth to intensive, connotative growth [38]. In the future, whether in economic or social development, and whether in changes in modes of production or ways of life, cities are destined to be central places where factors gather and intersect. Cities are not only engines of economic development, but also important carriers of social service functions, especially in public service fields such as education, health care, and housing. Open public spaces in cities promote citizens' cultural participation and social interaction, creating a favorable urban culture and social atmosphere and thereby improving urban residents' quality of life. Overall, in the new development stage, China's urban development is undergoing a strategic transformation from “urban construction” to “modernizing the urban governance system and governance capacity” [39-40]. The development of information technology and the digital economy, which has triggered the Fourth Industrial Revolution, have directly generated profound changes in concepts of urban cognition, guiding measures, planning systems, and disciplinary content [41].

The report to the 20th CPC National Congress proposed the goal of building livable, resilient, and smart cities. Under the overall goal of modernizing urban governance, and in connection with the development of new quality productive forces, clarifying the scientific bases and systemic pathways for realizing these goals has become the first urban problem that urbanology in the new era must address (Fig. 1). The practical significance of building urbanology in the new era lies in the following:

1) Implementing Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era; deeply understanding the relationship between cities and the development of productive forces from the perspective of systems science; promoting better adaptation among relations of production, productive forces, the superstructure, and the economic base; carefully summarizing the historical process of urban development; and forming the correct direction and implementation pathways for urban development.

2) Understanding cities as a whole; studying the objective scientific laws of urban development in China; guiding the expansion of applied theories in various urban sciences; solving problems that arise in urban development; and achieving the goals of sustainable development, livability, and suitability for work.

3) Through the construction of smart cities, simulating the organic links, rules, and laws among the subsystems within the giant open complex system of the city; using systems thinking to achieve precise governance of hot and difficult urban issues; and promoting the modernization of the urban governance system and governance capacity.

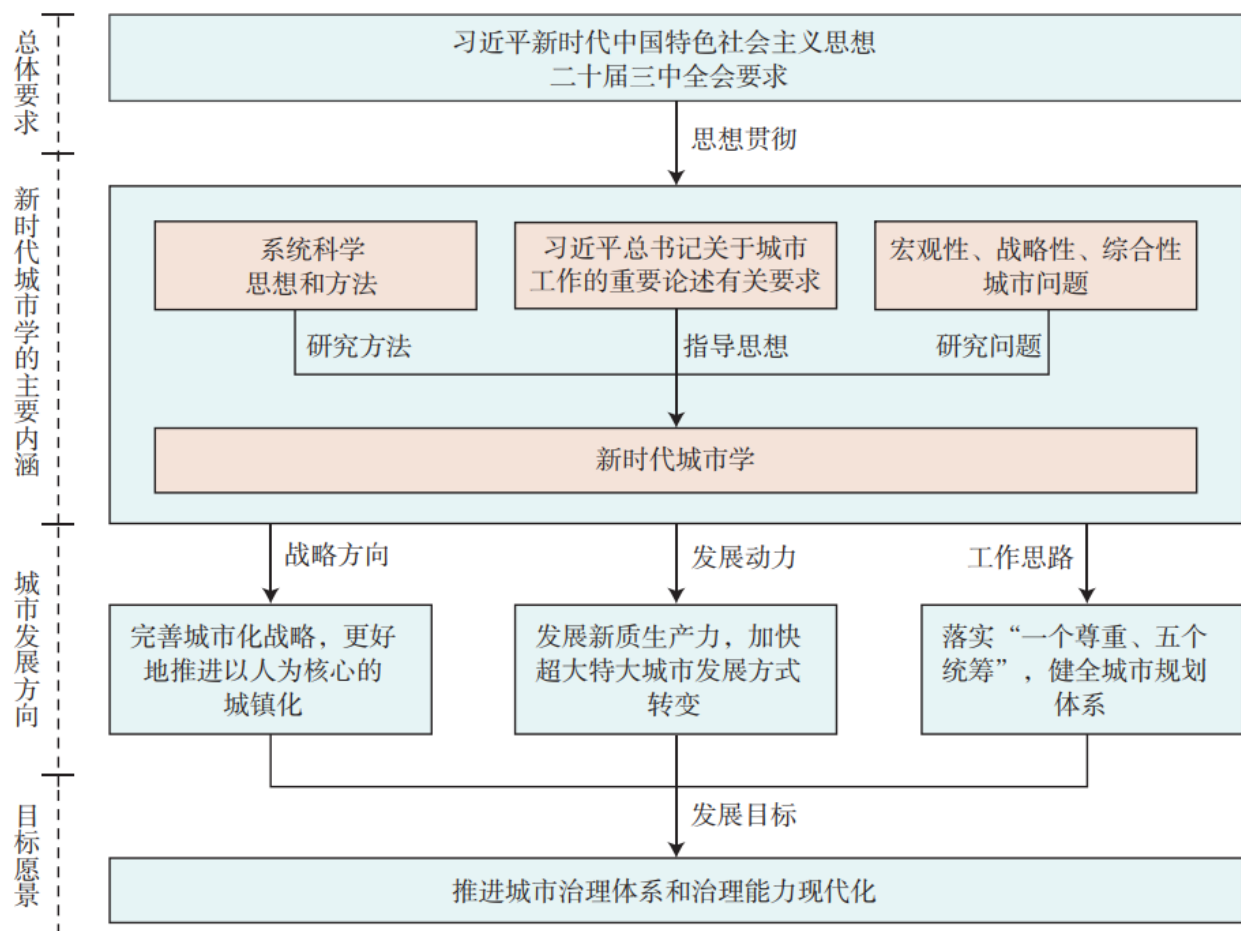


Fig. 1 Core connotations of urbanology in the new era, urban development directions, and target vision

#### 4.2 Core content of urbanology in the new era

Urbanology in the new era should be guided by the implementation of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, put into practice General Secretary Xi Jinping's important statements on urban work [42], adhere to the ideas and methods of systems science, and study macro, strategic, and comprehensive urban issues in the new development stage. It should provide key theoretical support for modernizing the urban governance system and governance capacity. The core contents of



urbanology in the new era include: 1) conforming to the socialist system with Chinese characteristics, reflecting the overall requirements of Chinese modernization, and building livable, resilient, and smart cities that give the people a sense of gain, happiness, and security; 2) following the deployment of national development strategies and adapting to the transformation of the principal social contradiction in the new era; 3) developing new quality productive forces according to local conditions and forming a new pattern in which cities drive regional development; 4) understanding urban forms at China's current stage of urbanization, implementing the rural revitalization strategy, and promoting integrated urban-rural development; 5) adapting to the development of the digital economy and gradually shifting from purely qualitative analysis to methods combining qualitative and quantitative analysis. The key points are as follows:

1) Chinese modernization is the expression of the development goal of socialism with Chinese characteristics. Developing new quality productive forces opens a new voyage toward the great rejuvenation of the Chinese nation through Chinese modernization and expands new pathways toward modernization. Urban development should make efforts and contributions commensurate with this era in serving national strategies, social development, and cultural inheritance.

2) Cities are important engines of national economic growth and wealth creation. Economic goals are mediating, whereas social goals are fundamental. Cities and economic development complement and reinforce each other. Cities are places where different social groups live and work. Urban development and the formulation of public policy must consider the needs and demands of different groups and improve the level of basic urban public services through urban development.

3) The development of the modern economy relies mainly on science and technology, and the future will be a digital era of intellectual competition. Informatization is a field of scientific and technological innovation in which global R&D investment is concentrated, innovation is active, applications are extensive, and spillover effects are strong. It is a global high ground of technological innovation. As carriers of innovation and creative industries, cities should develop into modern cities that better promote knowledge progress, industrial prosperity, and entrepreneurial vitality.

4) Ecological bottom lines must be upheld. The foundational role of territorial spatial planning should be strengthened, and urban residential environment construction should be integrated into ecological protection and development, with ecological protection always placed first. Cities are not only centers of economic and social activity, but also important components of the ecological environment. Urban development and ecological protection must be balanced to achieve sustainable development.

5) New industrialization, informatization, urbanization, and agricultural modernization are developing in parallel. Correctly handling the relationship between industry and agriculture and between cities and the countryside is essential; the level of productive forces determines urban-rural relations and their characteristics. In the early stage of productive-force development, urban-rural separation may occur, but as social productive forces continue to develop and progress, cities and villages will once again move toward integration, gradually forming a situation of mutual integration among factors.

6) Cultural inheritance should uphold fundamental principles while fostering innovation. It requires both intergenerational continuity and protection, and renewal in keeping with the times. Culture is not only the soul of the city, but also an important marker of urban character and quality, as well as a lubricant for harmonious urban development. Good cultural inheritance strengthens residents' sense of belonging and pride, enhances cohesion and identity, and provides intellectual support for urban development.

7) The city is a giant open complex system, and scientific research on cities requires an integrated methodology combining qualitative and quantitative approaches [43]. On the one hand, it should rely on computers, big data, artificial intelligence, and other technologies; on the other hand, it should draw on

expert knowledge, practical experience, and public opinion. This is the basic methodology of urban science research and an important path for making such research deeper and more substantive.

4.3 Urbanology in the new era and the six key disciplinary systems

Because urban work is a systems engineering endeavor, it is necessary to build an urban science disciplinary system led by urbanology in the new era so that urban work can receive a continuous supply of scientific strength. Based on the practical significance and core content of urbanology in the new era, this paper extracts from many urban-related disciplines a system of urban sciences supported by six key fields: urban sociology, urban economics, urban ecology, urban cultural heritage conservation, urban transport studies, and urban-rural planning (Fig. 2). This system is intended to provide systematic and sustained scientific ideas and professional knowledge for urban work now and in the coming period.

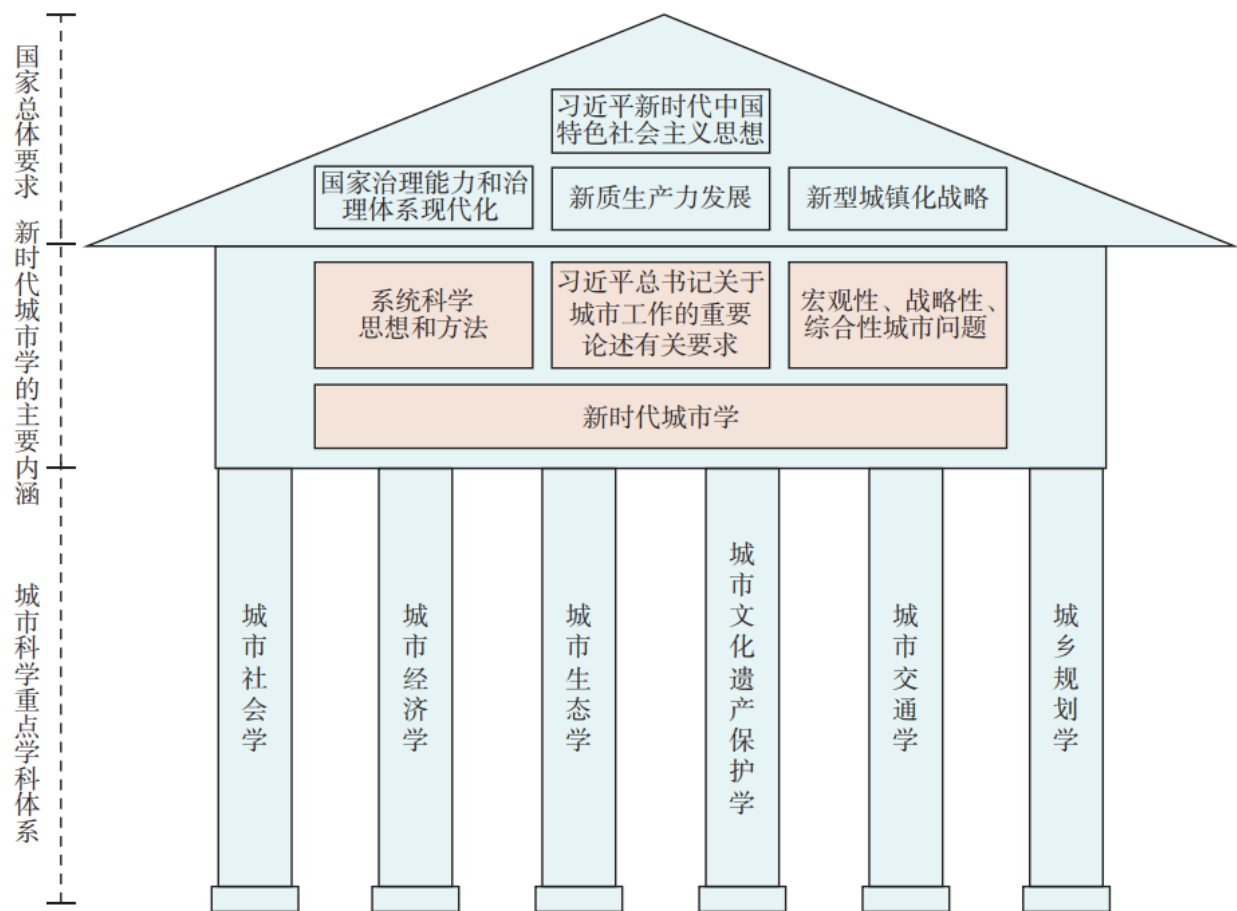


Fig. 2 Interdisciplinary framework of urban sciences anchored by urbanology in the new era

The six key disciplines cover the crucial fields of urban work in the new development stage. Within the urban science disciplinary system led by urbanology in the new era, their supporting value lies in the following:

1) Urban sociology emphasizes the study of cities from the perspective of people [44]. Advancing people-centered urbanization is the foundation of urban development, and the orderly citizenization of permanent residents who are capable of stable employment and life in cities is an important embodiment of people-

centered urbanization. Urban sociology can provide the necessary professional knowledge and is therefore one of the important supporting disciplines of urbanology in the new era.

2) Urban economics emphasizes that cities are the main carriers of China's economic activities [45], and that urbanization plays a fundamental role in promoting economic development. Under the guidance of the new quality productive forces theory in urbanology in the new era, urban economics research will help unleash huge domestic-demand potential through urbanization, improve labor productivity, and promote social equity and common prosperity [46].

3) Urban ecology emphasizes that urban development must be integrated into the broader pattern of regional ecological and environmental protection, making it an important component of urbanology in the new era [47]. Urban ecology research can provide key scientific knowledge for advancing ecological civilization, building a Beautiful China, implementing the “dual-carbon” goals, and accelerating the formation of green modes of production and life. It has important practical and strategic significance for urban modernization.

4) Urban cultural heritage conservation is an emerging discipline concerned with inheriting historical context [48]. Cities are carriers of cultural heritage, and cultural heritage gives cities distinctive historical and humanistic character. Establishing and developing urban cultural heritage conservation helps properly handle the relationship between protection and development, understand and exert the social and economic value of cultural heritage at a higher level, and promote high-quality urban and rural construction.

5) Urban transport studies focus on how to organize efficient, safe, low-consumption, and sustainable urban operation [49]. Starting from people's needs, urban transport studies examine the ternary mechanism of “physical space - social space - information space,” emphasize the construction and operation of compound urban transport networks, constitute a key application scenario for information technology, and serve as an important lever for building smart cities and implementing the digital transformation of urban governance.

6) Urban-rural planning centers on land use and the planning of urban physical space [50]. At present, the discipline of urban-rural planning is undergoing adaptive adjustment from urban-rural planning to territorial spatial planning [40, 51-53]. Urban-rural planning is both the origin and the point of application of urbanology. The management of land and space use is the spatial foundation of urbanology in the new era, and an important pathway for implementing the requirements of developing new quality productive forces and moving urbanology from applied theoretical science toward practical application. In the context of comprehensively deepening reform and advancing Chinese modernization, the urban planning system<sup>④</sup> should be examined and improved from the perspective of urbanology in the new era, so as to enhance the efficiency of land and space use.

## 5 Conclusion

More than forty years have passed since Qian Xuesen proposed the establishment of urbanology. During this period, urbanology has become a subject of concern and advocacy among many scholars in China and abroad. China is now in a critical period of comprehensively advancing Chinese modernization, and building modern cities is an essential part of that endeavor. Against this background, this paper has reviewed the historical context of building urbanology in the new era, drawn on overseas urbanology research, and taken the Chinese innovation of Marxist productive-force theory - especially new quality productive forces - as its point of focus. It has explained the practical significance and core content of building urbanology in the new era and proposed establishing a system of six key urban science disciplines led by new-era urbanology, in the hope of providing systematic and sustained scientific support for the construction of modern cities.

## Notes

① During implementation, some projects were merged and others cancelled. The number of projects ultimately completed was 150, but people have become accustomed to referring to them collectively as the “156” key construction projects.

② In 1985, China formally promulgated the Regulations of the People's Republic of China on Household Registration, centered on the household registration system. In 1963, on the basis of this system, the Ministry of Public Security divided household registration into “agricultural” and “non-agricultural” categories, which served as the basis for allocating state-planned commodity grain. It later gradually evolved into an urban-rural dual structure and administrative management system attached to the household registration system.

③ Since the founding of New China, the Party and the state have convened four National (Central) Urban Work Conferences. The Urban Work Conference is China's highest-level meeting devoted specifically to urban work. It provides guiding ideas, overall approaches, and key tasks for urban work, and is an important foundation for Chinese urbanology research and urban development.

④ The Decision of the Central Committee of the Communist Party of China on Further Comprehensively Deepening Reform and Advancing Chinese Modernization proposes “improving the urban planning system and guiding the coordinated development and intensive, compact layout of large, medium-sized, and small cities and small towns.”

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