

Theory and Practice of the Science of Human Settlements in China

Written by Mao Qizhi Translated by Ye Qimao

Abstract: The science of human settlements is the science that studies the relationship and development between human settlements and their environments. China's theory and practice of the science of human settlements are one of the landmark achievements of the 40th anniversary of reform and opening-up. The article is divided into two parts, the theory and the practice. Part one outlines the origin and development of the science of human settlements in China and its core contents. As its founder of the science of human settlements in China, Wu Liangyong developed and integrated the methods of architecture, urban and rural planning, and landscape architecture. As a result, he provided a theoretical framework for the development of human settlements in urban and rural area as spatially ordered and environment suitable for living. Part two describes the various practice activities around the science of human settlements, from the "Habitat I" to the "Habitat III", the conferences of the United Nations, from the Habitat Agenda to the New Urban Agenda, the Habitat Movement at home and abroad have closely exchanged and promoted interaction. Under the supervision of Wu Liangyong, the research team of Tsinghua University has adhered to problem-oriented and from the reality of China in the practice. Wu Liangyong with his term has looked consciously for a new "paradigm" for the development of human settlements in urban-rural areas and continued to promote the development of human settlements of progress.

Keywords: Human Settlement, Ekistics, The Science of Human Settlements, UN-Habitat, New Urban Agenda, Wu Liangyong

Introduction

The annual National Science-Technology Award Ceremony held in the Great Hall of the People in Beijing on February 14, 2012. Professor Wu Liangyong of Tsinghua University, members of both the Chinese Academy of Sciences (CAS) and the Chinese Academy of Engineering (CAE), received the National Supreme Science and Technology Awards for the year 2011.

The National Supreme Science and Technology Awards Evaluation Committee identified that Wu Liangyong is the Chinese founder of the Science of Human Settlements. Wu Liangyong established a series of

spatial planning and design methods and practice models centering human settlement development, thus provided a theoretical framework for achieving the goals of orderly space and livable environment. The science studies the relationship and development laws of human settlements and their environment. As the result of the studies, Wu Liangyong developed the methods of architecture, urban and rural planning and landscape architecture. And Wu Liangyong proposed the regional coordination theory, the organic renewal theory and the regional architecture theory.

Wu Liangyong organized the scientific community for the Science of Human Settlements and gave full play to the advantages of various disciplines. By successfully applying the Science of Human Settlements, Wu Liangyong carried out the studies and practices of urban planning and design in multiple dimensions and categories including regional, urban and rural planning, architectural design, and landscape architecture. Wu Liangyong also participated in the design of the new building of Beijing Library, the planning and design of the expansion of Tian'anmen Square, the campus design of the Central Academy of Fine Arts, the Confucius Institute, and other major projects.

Wu Liangyong received a number of awards. He won a World Habitat Award of the United Nations for his contribution to the house-building project of Ju'er Hutong in Beijing in 1993. He won the Ho Leung Ho Lee Prize in 1995 and the UIA Architectural Education Prize of the International Union of Architects in 1996, the Asian Institute of Architects Gold Award, the Tan Kah Kee Science Award, the Prince Claus Award from the Netherlands in 2002. Wu Liangyong devoted himself to education and scientific research and practice, and is still active in the forefront of science and technology.

The National Supreme Science and Technology Awards to Wu Liangyong is the recognition of architecture, urban and rural planning, landscape architecture and other related disciplines by the academic community. It also is a state's praise of the Science of Human Settlements created by Chinese architects, planners and landscape architects represented by Wu Liangyong as their outstanding representative and their contribution to the development of social, economic and cultural development.

1 Theory of the Science of Human Settlements developed in China

1.1 Origin of the Science of Human Settlements

Wu Liangyong observed: "since the mid-18th century, the world's urbanization has gradually accelerated and urban problems have

intensified with the advancement of the industrial revolution. In order to solve those urban problems, the urban planning theories based upon various disciplines in modern time and contemporary have kept coming up. Among those theories, the urban planning theories established on architecture, economics, sociology, geography, etc. have developed the fastest. For their own academics, they all make sense. However, the actual results have proved that those theories can't get rid of the limitations of their disciplines. They are difficult to fully adapt to the needs of development and solve real problems without compromise”.

Thus, those scholars of the generation of Wu Liangyong devoted themselves to the exploration of a new paradigm for the development of urban studies by means of system theory, cybernetics and information theory (the old three theories) and dissipative structure theory, synergy theory and mutation theory (the new three theories), various inter-disciplines, cross edge disciplines and the disciplines on complexity. Among those explorations, ekistics related to the science of human settlements as a paradigm is a prominent example.

Ekistics involves every kind of human settlement from Anthropos (individual) to Ecumenopolis (global city). It develops the scientific mode by means of the convergence of the conceptions and methodologies from geography, ecology, culture, politics, anthropology, human psychology and aesthetics. It is related to regional, city, community planning, and dwelling design.

The father of ekistics, Constantinos Apostolos Doxiadis (1913-1975, often cited as C. A. Doxiadis), a Greek architect and town planner, coined the term “ekistics” in 1942. According to Doxiadis’ explanation, ekistics is derived from the Greek adjective οικιστικός. The ancient Greek adjective οικιστικός means “concerning the foundation of a house, a habitation, a city or colony; contributing to the settling.” It was derived from οικιστής (oikistēs). The ancient Greek noun means “the person who installs settlers in place”. This may be regarded as deriving indirectly from another ancient Greek noun, οίκισις (oikisis). It means “building”, “housing”, “habitation”, and especially “establishment of a colony, a settlement, or a town” (already in Plato), or “filling with new settlers”, “settling”, “being settled”.

Ekistics theory of Doxiadis emphasizes that all human settlements, including villages, towns, cities, etc., as a whole being, are organized in five elements or principles: nature, anthropos, society, shells, and networks of human settlements and subject to systematic investigation. Doxiadis founded the academic periodical, *Ekistics: the problems and science of HUMAN SETTLEMENTS* (Hereinafter referred to as *Ekistics*), overlapping the fields of human geography, environmental psychology, and the

sciences of the built environment, published by Athens Center of Ekistics established in 1963. The Delos Symposia was held to discuss the issues of human settlements once a year. During the Third Delos Symposia in 1965, the World Society of Ekistics (WSE) was established. Doxiadis was an outstanding representative of architecture and urban and rural planning after World War II. It was particularly dazzling in the 1950s and 1960s. His active international academic activities were directly linked to the United Nations and the World Bank. But when he died in 1975, the Doxiadis Empire gradually declined, and his doctrine became increasingly bleak after the 1980s.

1.2 Ekistics comes to China

Wang Jintang, a Taiwanese scholar, translated *Architecture in Transition* by Doxiadis (1963) to Chinese and published by Taipei's Tailong Bookstore in 1971. As a result, the spread of Doxiadis theory began in China between the 1960s and the 1970s. Chuin Tung, a late professor at Nanjing Institute of Technology, published *New Architecture and Schools* in 1980. The book introduced Doxiadis and his ekistics to Chinese. The translated ekistics into Chinese originally means "settlement planning and design".

As Wu Liangyong's recall, his first understanding of Doxiadis could be traced back to the late period of the Cultural Revolution. Once, he had the opportunity to go to the National Library in Beijing and read academic journals. When he read the reports about Doxiadis, he was interested in his works. From 1980 to 1981, Wu Liangyong was invited to give lectures at the University of Kassel, Germany. He discovered *Ekistics: An Introduction to the Science of Human Settlements* (Constantinos Apostolos Doxiadis, 1968). He considered some of the concepts in the book were novel and rational. He was quite happy to read further.

Wu Liangyong observed, in the first meeting after being elected as an academician of the Chinese Academy of Sciences in 1981, that it was necessary to conduct a basic exploration of architectural theory in order to cope with the new era of urban and rural planning and development in China. He believed that in order to clarify the true meaning of architecture and its important role for social development and actively adapt to the needs of the times, the field of architecture should be extended in dimension and in depth. We should have a breakthrough in the understanding of architecture from the concept of building to the concept of settlement. Doxiadis called the extraction and systematic research of the concept of settlement as Ekistics, and Wu Liangyong translated it as "the Science of Human Settlements". He observed that architects talked about building to the exclusion of other things so that building was difficult for

non-professionals to understand though architects recognized the dual attributes of the building and laid stress on the attribute of art. However, as soon as we connected building to the settlement, our perspective was very different indeed. The whole settled environment was not a simple superposition of the building with the building, but a place where people could live and work in a variety of ways. From an individual building to several buildings, village, town, city, larger city, and megacities, all of them were a type of settlement. From the point of view, architecture integrated naturally with cities should integrate with anthropology and sociology, geography and other disciplines in order to analyze and study practical problems. The Science of Human Settlements is a fundamental theory. Based on the fundamental theory, we could recognize the characteristics of region, culture, science and technology of building. Thus, we would finally produce “the General Theory of Architecture” and “the Science of Human Settlements”.

In 1984, Wu Liangyong went to University of Tsukuba in Japan to attend the International Conference on Human Settlement. At the evening party held by the Japan Society of Ekistics, he met the president of the Society, Eiichi Isomura (1903-1997), the secretary-general of the World Society of Ekistics (WSE) and editor of *Ekistics*, P. Psomopoulos (1924-2017) from Greece, as well as Japanese architect Koichi Nagashima and his wife Catharine Nagashima, who had studied at the Doxiadis school, and professor Gerald B. Dix of the University of Liverpool, who became president of the WSE late on (1987-1990). Since then, Wu Liangyong began to actively participate in WSE activities.

In 1986, Wu Liangyong supervised the postgraduate Zhang Xiaoming to complete his master’s thesis, Review Doxiadis, and Ekistics. The review is one of the representative works in the early stage for the studies of the science of human settlements in China.

In the spring of 1987, Zhou Yongyuan (1923-2008), the former director of Beijing City Planning Bureau, and Psomopoulos, editor of *Ekistics* in Greece, made efforts to publish “The Human Settlements in the People’s Republic of China (PRC)”, a special issue of *Ekistics*, including twelve articles by Chinese scholars such as Wu Liangyong, Zhou Yongyuan, Chen Weibang, Gu Yunchang, Zhang Yuanduan and Dong Guangqi, etc., and the content relevant to urban planning, housing development, historical heritage conservation, environmental protection, landscape architecture and the case studies in relation with China’s urban and rural development such as, Beijing, Shashi, Nantong, Suzhou, Qingzhou (Yidu) and Hongshan Farm (Xiaoshan District, Hangzhou).

In 1993, Wu Liangyong was elected as the thirteenth president of the

World Society of Ekistics (WSE). Due to his recommendation, a group of Chinese scholars participated in the WSE activities, and many people were accepted as members of WSE. In June 1996, Tsinghua University, the Canadian International Development Agency (CIDA) and the World Society of Ekistics jointly held an international conference on Towards a Sustainable Urban Future: Mega-cities, Regional Development and Planning in Beijing and the special event, “Ekistics Day”. The proceedings of the conference were subsequently published in the special issue of *Ekistics* in 1997, with the theme of Mega-cities and Mega-city Region. In November 2008, with the opportunity of the 4th World Urban Forum (WUF4) held in Nanjing, the World Society of Ekistics held its annual conference in the School of Architecture at Southeast University.

1.3 The establishment of the Science of Human Settlements

First of all, Wu Liangyong considered, inspired by the conception of ekistics, the General Theory of Architecture. In the academic seminar of 1987, the Future of Architecture as a Science, held by Tsinghua University, Wu Liangyong proposed the General Theory of Architecture. Then he presented his thoughts as an academic report to the university. Two years later, *A General Theory of Architecture* written by Wu Liangyong was published, including ten chapters, namely: settlements, regionalism, culture, science and technology, policy and legislation, profession, education, art, methodology and the framework of a general theory of architecture. The book won the first prize of the 1990 National Science and Technology Progress Award by the State Education Commission.

Then, Wu Liangyong raised the protection and development of the built environment to the height of the construction and development of human settlements and began to explore the establishment of a group of disciplines on the Science of Human Settlements in China after the creation of the General Theory of Architecture. In 1993, Wu Liangyong invited Zhou Ganshi (1930-2014) and Lin Zhiqun (1929-1993) to analyze the situation and problems of China’s urban and rural development and formally proposed the establishment of the Science of Human Settlements as a group of disciplines in a report to the Chinese Academy of Sciences. He conceived that the harmonization of human with nature would be a core of this new group of disciplines, and the habitat environment would be the object for the study of this new group of disciplines. *Chinese Science*, a newspaper, reported the proposal with the title, Academician Wu Liangyong is looking forward to the future of China’s building industry. The conception of the Science of Human Settlements received a positive response from the academic community and attention from relevant

parties soon after that.

The book, *Today and Tomorrow for China's Construction Industry* written by Wu Liangyong, Zhou Ganshi, and Lin Zhiquan, was published in 1994. The leadership of Tsinghua University examined the possibility and feasibility to establish an institute for the sciences of the human settlements managed by the university in the summer of 1994. The Center for Science of Human Settlements of Tsinghua University was set up on November 27, 1995, which was one year late. During this period, the National Natural Science Foundation of China has sponsored four academic conferences on "Habitat Environment" (Kunming conference in 1994, Xi'an conference in 1995, Guangzhou conference in 1996, Chongqing conference 1998). In addition, Tsinghua University and Tongji University successively run the program on human settlements, and Chongqing University held an international academic conference on the mountain habitat environment. The organization and activities of the academic community engaged in the study of human settlements have gradually increased and the term human settlements generally accepted and used.

Wu Liangyong points out that the establishment and development of the new discipline system of the Science of Human Settlements from a new perspective and multi-dimensions would help to reveal the problems existing in the current human settlements and all kinds of phenomena appear due to the rapid development of China in the urbanization process, and would scientifically predict the major prospects in the development of human settlements, and make full use of the existing scientific research results to solve some complicated contradictions in the development of human settlements. At the same time, the rich practice of urban and rural development in China would make the study of the science of human settlements possible to obtain better conditions and more operational results than other countries and regions. In such a new academic concept and an open academic system, the original relevant subject areas would be enriched, expanded, cross-over and recombined, and could find some more comprehensive and practical solutions for the specific problems raised in China's development practice.

1.4 The Core of the Science of Human Settlements

Introduction to Sciences of Human Settlements is the monograph of Wu Liangyong, which was published by Tsinghua University Press in 2001. Wu Liangyong recognized, "the Science of Human Settlements is still in its infancy. Now it is only sketching its outlines to help people's thinking. The overall goal of the Science of Human Settlements is, through studies and development, to explore the multi-disciplinary group with the purpose to

improve and enhance the quality of human settlements, including those parts related to the habitat environment in natural science, technical science and humanities, and to form a new discipline system—the Science of Human Settlements”.

(1) The paraphrase to human settlements

Human settlement is a settlement, locality or populated place in which people live. Human settlement is a surface space closely related to human being survival activities. Human settlement is the base on which human beings depend. Human settlement is the main place where people use nature and transform nature. According to the function and influence degree of human being survival activities, in terms of space, the human settlements can be further divided into two parts: ecological green systems space and artificial built systems space.

(2) The composition of human settlements

The human settlements include five major systems: natural systems, human systems, social systems, residential systems, and support systems. The human settlements consist of five levels: global, regional, city, community (village and town) and building. This definition references to Doxiadis theory and takes the actual problems in China and the actual situation of human settlements research into account as well.

Through extensive thinking on a number of issues around the world and China, the five principles for the development of human settlements are proposed:

- To face up to the ecological predicament and to improve the ecological awareness;
- The positive interactions between the development of human settlements and economic development;
- The development of science and technology to promote economic development and social prosperity;
- Caring for the broad masses of the people and attaching importance to the overall interests of social development;
- The pursuit of science is combined with the creation of art.

(3) Basic research framework for the Science of Human Settlements

- We live in the environment we create as human settlements, in which we are center with other living organisms.
- We as human beings have a common pursuit for our settlements in various periods and with diverse cultures. On the other hand,

various people in different regions and distinct times have their special requirements for their own human settlements. According to China's situation, we call the basic requirements of ecology, economy, technology, society, and humanities (culture and art) as human settlements as the five principles (or the five major programs) with the specific connotations and focuses of China.

- We may choose one system among five systems (natural, human, social, residential, support network) as the core of a research process according to our specific circumstances.
- We may concentrate our studies on a level among the five levels according to different topics but we have to pay attention to the interrelationship among them.

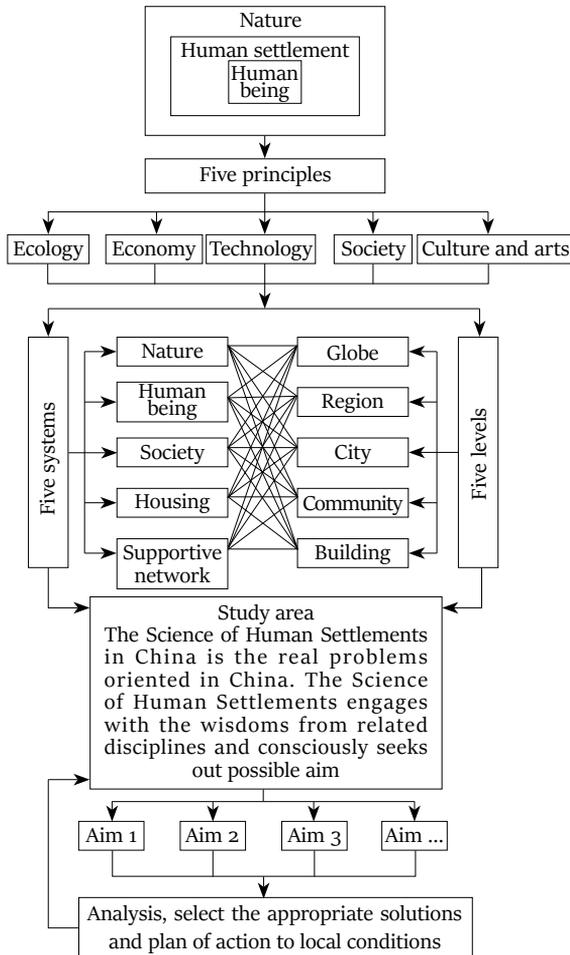
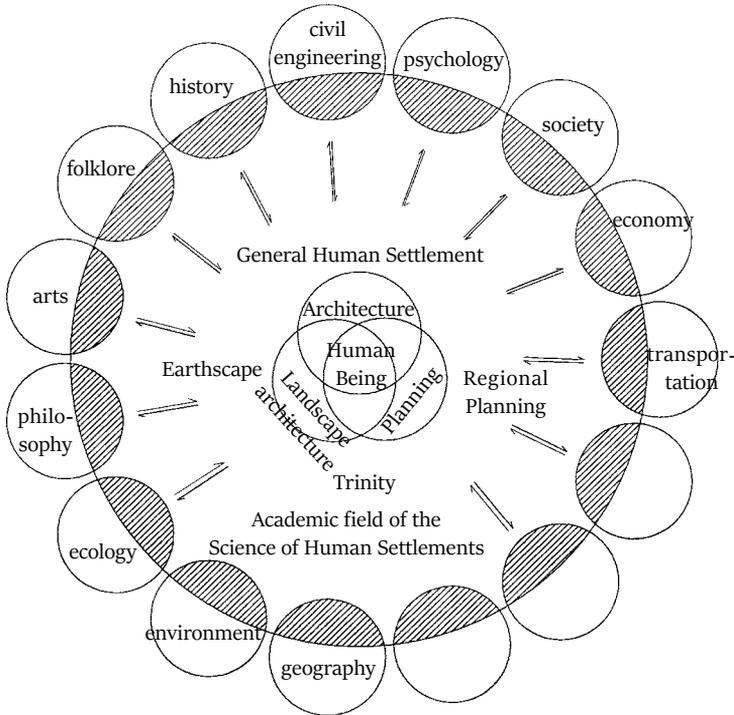


Figure 1. The framework of the Science of Human Settlements

- We may make alternatives with various possibilities to encounter the real issues with special properties and context according to our purpose and emphasis.
- We may compromise due to unknown factors and unforeseen circumstances in certain for our alternatives.
- We have to improve and enhance our studies and relevant recognitions above in order to suit for the change of circumstances.
- It is a brief of the framework of the science of human settlements.

(4) The science of human settlements with an open-ended system

The science of human settlements consists of a group of disciplines. It is forever in progress that with a dynamic mechanism and the developments of a variety of related disciplines. It solves creatively the problems in complicated social practices by means of all relevant disciplines. Therefore,



Notes: The disciplines showing in the figure are just indicated because it has an open-ended system as we said above. We do not separate the levels of the related subjects for the convenience of explanation. We do not take the special links and distinctions among peripheral disciplines into account. The arrows indicate the mutual requests and mutual penetration among disciplines. The blank circles indicate the relevant subjects to be developed.

Figure 2. The Science of Human Settlements with an open-ended system

the science of human settlements together with economics, sociology, geography, environmental science constitutes the science of human settlements with an open-ended system.

2 Practice of the Science of Human Settlements

2.1 The movement of human settlements under the auspice of the United Nations

At the end of World War II, the global economy gradually recovered and rose up to the levels of environmental pollution and ecological damage. Acid rain and marine pollution in the 1950s and the 1960s became a global trend. The United Nations Conference on the Human Environment was held in Stockholm, Sweden from June 5–16 in 1972. It was the first international conference to discuss contemporary environmental issues and explore strategies to protect the global environment. The meeting agreed upon a Declaration containing 26 principles concerning the environment and development; an Action Plan with 109 recommendations, and a Resolution Principles of the Stockholm Declaration. In particular, Article 15 of the Common Principles stated “Human settlements must be planned to eliminate environmental problems”, Article 13 “Integrated development planning is needed” and Article 14 “Rational planning should resolve conflicts between environment and development”.

On January 1st 1975, the UN General Assembly established the United Nations Habitat and Human Settlements Foundation (UNHHSF), the first official UN body dedicated to urbanization. Then under the umbrella of the United Nations Environment Program (UNEP), its task was to assist national program relating to human settlements through the provision of capital and technical assistance, particularly in developing countries. The UNHHSF was only given an initial budget of 4 million US dollars for a total period of four years.

(1) Habitat I and the United Nations Centre for Human Settlements (UNCHS)

Because two-thirds of humanity around the world was still rural at the time, urbanization and its impacts were less prominent in the UN agenda. However, alarmed by rapid and uncontrolled urban growth, particularly in the developing world, the UN General Assembly in 1976 called for the First United Nations Conference on Human Settlements (Habitat I) addressing the challenges and future of human settlements. During the conference, which was held in Vancouver from 31 May to 11 June 1976, it was recognized that the conditions of human settlements directly affect human, social, economic development, and that uncontrolled urban

development can have severe environmental and ecological impacts. This led to the Vancouver Action Plan which outlined the first strategies at an international level to address and control the issues of urban growth. The approach towards urbanization was already holistic and global, linking together political, spatial, social, cultural, economic, and environmental concerns.

While taking into account human and social dimensions as well as the needs of disadvantaged and marginalized population groups, Habitat I gave the governments specific recommendations and urged to develop national strategies and policies to deal with land use and tenure, population growth, infrastructure, basic services, and the provision of adequate housing and employment. The Vancouver Declaration starts with a preamble stating that “unacceptable human settlements circumstances are likely to be aggravated by inequitable economic growth and uncontrolled urbanization, unless positive and concrete action is taken at national and international levels”. In the Guidelines for action, various elements of a human settlements policy are defined. Focus is placed on harmonious integration, reduction of disparities between rural and urban areas, orderly urbanization, progressive minimum standards and community participation. The cornerstones of the current UN-Habitat mandate were set by the Vancouver Declaration, which carried an action plan with 64 recommendations for national action, and by the Vancouver Action Plan.

This conference resulted in the creation, on 19 December 1977, of the precursors of UN-Habitat: the United Nations Commission on Human Settlements—an intergovernmental body—and the United Nations Centre for Human Settlements (UNCHS), which served as the executive secretariat of the Commission. Indian scientist Dr. Arcot Ramachandran (1923-2018) was appointed as Deputy Secretary-General of the United Nations and the first Executive Director of UNCHS. Since then, the management of UNHHSF was also transferred to UNCHS.

(2) From Habitat II to Habitat III

Habitat II, the second conference on Cities held by the United Nations in Istanbul, Turkey in 1996 was going to assess two decades of progress since Habitat I in Vancouver and to set fresh goals for the new millennium. Adopted by 171 countries, the political document—dubbed the Habitat Agenda—that came out of this “city summit” contained over 100 commitments and 600 recommendations.

The Habitat Agenda reaffirms Governments’ “commitment to better standards of living in larger freedom for all humankind.” Governments

must combat deteriorating conditions by, inter alia, addressing “unsustainable consumption and production patterns, particularly in industrialized countries.” The interdependence of rural and urban development is noted. The promotion of “gender equality in policies, programs and projects” for shelter is pledged. The “commitment to the full and progressive realization of the right to adequate housing as provided for in international instruments” is reaffirmed. In view of different contributions to global environmental degradation, governments reaffirm the principle that countries have common but differentiated responsibilities. Local action should be guided “through local programs based on Agenda 21, the Habitat Agenda, or any other equivalent programmed.”

From 1997 to 2002, Habitat—guided by The Habitat Agenda and, later, the United Nations Millennium Declaration in 2000—underwent a major revitalization, using its experience to identify emerging priorities for sustainable urban development and to make needed adjustments and corrections in its direction and organizational structure. On 1 January 2002, through General Assembly Resolution A/56/206, Habitat’s mandate was strengthened and its status elevated to a fully-fledged program in the UN system, giving birth to UN-Habitat, the United Nations Human Settlements Program. Key recommendations and fine tuning of the agenda were now underway, along with new strategies for achieving the urban development and shelter goals and targets for the next 15 years.

In 2015, member states approved the Sustainable Development Goals including a dedicated goal for urban development, which calls to “Make cities and human settlements inclusive, safe, resilient and sustainable.” A year later, at the UN Conference on Housing and Sustainable Urban Development—Habitat III—member states signed the New Urban Agenda. Habitat III, the United Nations Conference on Housing and Sustainable Urban Development, took place in Quito, Ecuador, from 17-20 October 2016. The UN Conferences on Housing (Habitat) are occurring in the bi-decennial cycle (1976, 1996 and 2016). The United Nations General Assembly decided to convene The Habitat III Conference in its resolution 66/207. The Habitat III Conference reinvigorates the global commitment to sustainable urbanization, to focus on the implementation of a “New Urban Agenda”.

Habitat III was one of the first United Nations global summits after the adoption of the Post-2015 Development Agenda. It gave the opportunity to open discussions on important urban challenges and questions, such as how to plan and manage cities, towns and villages for sustainable development. The discussion of these questions shapes the implementation of new global development and climate change goals. In particular, the conference elaborates

on Goal 11 of the Sustainable Development Goals: “Make cities and human settlements inclusive, safe, resilient, and sustainable.”

(3) New Urban Agenda (NUA)

The primary goal and outcome of the conference was an agreement by UN member states on the New Urban Agenda, which will serve as a guideline for urban development for the next twenty years.

New Urban Agenda makes frequent references to related UN agreements, including the Rio Declaration on Environment and Development passed in 1992, and the 2030 Agenda for Sustainable Development, the International Guidelines on Urban and Territorial Planning, the Sendai Framework for Disaster Risk Reduction (2015-2030), and the Paris climate agreement, all issued in 2015.

The four mechanisms envisioned for affecting the New Urban Agenda are:

- National urban policies promoting “integrated systems of cities and human settlements” in furtherance of “sustainable integrated urban development”.
- Stronger urban governance “with sound institutions and mechanisms that empower and include urban stakeholders” along with checks and balances, to promote predictability, social inclusion, economic growth, and environmental protection.
- Reinvigorated “long-term and integrated urban and territorial planning and design in order to optimize the spatial dimension of the urban form and deliver the positive outcomes of urbanization”.
- Effective financing frameworks “to create, sustain and share the value generated by sustainable urban development in an inclusive manner.”

New Urban Agenda is an action-oriented document which sets global standards of achieving the Sustainable Development Goals, rethinking the way we build, manage, and live in cities.

(4) World Habitat Day, World Habitat Awards, the UN-Habitat Scroll of Honor Award, Dubai International Award for Best Practice to Improve the Living Environment

World Habitat Day is observed every year on the first Monday of October throughout the world. It was officially designated by the United Nations and first celebrated in 1986. The purpose of the day is to reflect on the state of our cities and towns and the basic human right to adequate shelter. It also aims to remind the world of its collective responsibility for the habitat of future generations.

World Habitat Awards were established in 1985 by the Building and Social Housing Foundation as part of its contribution to the United Nations' International Year of Shelter for the Homeless in 1987. Two awards are given annually to projects from the Global South as well as the North that provide practical, innovative and sustainable solutions to current housing needs, which are capable of being transferred or adapted for use elsewhere.

The UN-Habitat Scroll of Honor Award was launched in 1989 and is one of the most prestigious human settlements awards in the world. It aims to acknowledge initiatives which have made outstanding contributions in the field of human settlements, provision of housing, highlighting the plight of people living in poverty or who have been displaced, developing and improving human settlements and the quality of urban life to leave no one behind echoing the Sustainable Development Goals 2030 with emphasis on Goal 11: Sustainable Cities and Communities.

The Dubai International Award for Best Practice to Improve the Living Environment represents the importance of strong and coherent partnerships in implementing the New Urban Agenda and SDG 11, and delivering socially, economically and environmentally sustainable cities for all. In line with Sustainable Development Goal 11—to make cities and communities inclusive, safe, resilient and sustainable—the Best Practice Award recognizes significant contributions which:

- have a demonstrable and tangible impact on improving people's quality of life;
- are the result of effective partnerships between the public, private and civic sectors of society;
- are socially, culturally, economically and environmentally sustainable.

Working closely with UN-Habitat, the award reflects the policy and commitment of the Dubai Government and the United Arab Emirates towards the sustainable development of human settlements and the protection of the environment.

2.2 The movement of human settlements in China

2.2.1 The Chinese government's contribution to the world movement of human settlements

China has gradually participated in relevant UN activities since the Chinese government returned to the United Nations in October 1971. China participated in the annual meeting of the UN Commission on Human Settlements as an observer from 1983. China responded to the 1987 International Year of Housing in urban and rural development. China was

formally accepted as a member state of the Human Settlements Committee in 1988. The Permanent Representative of China to the UNCHS was established in 1990.

The UN-Habitat (UNCHS) Beijing Information Office was established on October 29, 1992, in accordance with the relevant provisions of the Memorandum of Understanding signed by the Ministry of Development and UNCHS on August 6, 1991. The Ministry of Housing and Urban-Rural Development of China has been working with UN-Habitat for a long time to publish the magazine *Human Habitat* and translated a series of UN-Habitat publications into Chinese, which has promoted the Chinese participation in UN-Habitat and the World Habitat Movement. Since 2010, the International Science and Technology Center of the Eurasian Academy of Sciences, the China Mayors Association, the China Urban Planning Association and UN-Habitat have jointly compiled *The State of China's Cities*. Four volumes have been published so far.

(1) To participate in the Habitat II Conference

On June 3rd to 14th, 1996, the Chinese government delegation headed by Minister of Construction Hou Jie attended the Habitat II conference held in Istanbul, Turkey. Zou Jiahua, Vice Premier of the State Council, attended the special high-level government meeting and delivered a speech, expounding the Chinese government's stance on human settlements and introducing China's achievements in human settlements. Zou Jiahua pointed out that the two themes put forward by this conference fully reflect the concerns of human beings for the most basic living conditions and the needs of their own survival. "Everyone has the right to adequate housing" is a basic human right and an important part of the human right to survival and development.

Hou Jie expounded the views of the Chinese government on the theme of the Habitat II conference: 1) The key to solving the problems of the human settlement will be the promotion of economic development and poverty alleviation. 2) The attention will be paid to coordination with population and environment, sustainable development. 3) Extensive participation in society will be necessary. 4) It is necessary to implement the principle of equal emphasis on urban and rural areas. 5) The real conditions of our country will be a foundation for any activity. 6) The international cooperation with effective will be essential.

(2) To participate in the Habitat III Conference

On October 17th to 20th, 2016, Minister of Housing and Urban-Rural Development Chen Zhenggao participated in the Habitat III Conference held in Quito, Ecuador, as a special representative of the

Chinese government. In his speech, Chen Zhenggao indicated that China has undergone earth-shaking changes in the past two decades. The urbanization rate increased from 30.5% in 1996 to 56.1% in 2015, with an average annual increase of about 1.3 percentage points; urbanization became an important engine of economic growth in China. In the past two decades, China not only solved the problem of food and clothing for 1.3 billion people, but also worked hard to solve the housing problem of 1.3 billion people. The average housing floor area per capita in urban areas of China reached more than 33 square meters, and the average housing floor area per capita in rural areas reached more than 37 square meters. In particular, it provided spacious and bright new homes for more than 26 million families who originally lived in shanty towns. It also provided affordable housing for public rental housing for 17 million families.

2.2.2 Report on Human Settlements Development of the People's Republic of China

The Chinese government published “The Report on Human Settlements Development” in 1996, 2001 and 2016 respectively. Those reports explained the main tasks of China’s adherence to sustainable development in the process of urbanization and the improvement of human settlements, its achievements, policies adopted, and prospects and responses for the future.

(1) Report on development of human settlements in the People’s Republic of China (March 1996)

The Chinese government submitted “The Report on Development of Human Settlements in the People’s Republic of China” to the United Nations Habitat II Conference in April 1996. The report was prepared by the Ministry of Construction, the Ministry of Foreign Affairs, the State Science and Technology Commission, the National Family Planning Commission, the State Environmental Protection Administration, the National Bureau of Statistics and other relevant departments. It summarizes the work and experience of China made to improve the human settlements since 1980. It clarified the Chinese government’s basic stance on human settlements issues and proposed the China Human Settlements Development Action Plan (1996-2010). The goal of China’s human settlements development is to formulate and implement policies, regulations, development strategies and plans to promote the sustainable development of human settlements through government departments and legislative mechanisms, mobilize the active participation of all the people, and strive to build China’s urban and rural settlements with reasonable layout, complete supporting facilities,

favorable work, convenient living, clean environment, beautiful, quiet and comfortable living conditions.

(2) Report of the People's Republic of China on the development of human settlements (1996-2000)

The United Nations convened the "Istanbul+5" conference to comprehensively review the implementation of the Habitat Agenda adopted by the Habitat II Conference in June 2001. The Chinese government formed a delegation headed by Yu Zhengsheng, Minister of Construction to attend the conference held at the UN headquarters in New York. In order to support the convening of the "Istanbul+5" conference and continue to promote the improvement of human settlements in China, the Chinese government organized relevant departments to write "The Report of the People's Republic of China on the Development of Human Settlements (1996-2000)". The report summarizes the main work, achievements, policies and future prospects and countermeasures that China has adhered to in the process of urbanization since the Habitat II conference, and has maintained its achievements in improving the level of human settlements.

(3) China Country Report: Prepared for the United Nations Conference on Housing and Sustainable Urban Development (October 2016)

The Chinese government issued the "China Country Report: Prepared for the United Nations Conference on Housing and Sustainable Urban Development" in October 2016. The report summarizes China's work and effectiveness in human settlements over the past 20 years, analyzes the challenges and problems it faced, and proposes goals, countermeasures, and actions for the next phase.

The urban and rural settlement development action plan proposed in the report targets for 2020 include:

- The level and quality of urbanization will increase steadily. By 2020, the urbanization rate of permanent residents will reach 60%, and the urbanization rate of household registration population will reach 45%.
- The average floor space per capita of the town reached about 35 square meters, and the renovation of existing urban shanty towns, urban villages and dilapidated residential buildings were basically completed. The newly built urban housings have reasonable layout, complete facilities, and distinctive features. It has good thermal insulation, heat insulation, and sound insulation performance. The building structure meets the requirements of earthquake resistance, fire prevention, and energy saving.
- The average road network density of urban built-up areas reaches 8 km/km², and the road area ratio reaches 15%. The sharing rate of public

transportation in oversized and mega-cities reaches over 40%, the large cities reach more than 30%, and the small and medium-sized cities reach more than 20%. The public water supply penetration rate reached 95%; the urban sewage treatment rate reached 95%, the domestic garbage treatment rate reached 95%; the urban built-up area green land rate reached 38.9%; the urban flood control and drainage facilities construction were significantly strengthened.

- Practice the construction of eco-city in the form of “low-carbon ecological demonstration city”, “green eco-city” and “green low-carbon key small towns”, leading urban transformation and development, and improving the urban living environment. Strive for urban green buildings to account for 50% of new buildings.

- Basically complete the task of transforming existing dilapidated houses in rural areas. The basic living conditions such as rural residential housing, drinking water, and travel have improved significantly, and 90% of the village’s domestic garbage has been effectively disposed of. The living environment has basically been clean, tidy and convenient, and a number of beautiful and livable villages with their own characteristics have been built.

2.2.3 China Human Settlements and Environment Award and China Human Settlements and Environment Award for best practices

The Ministry of Construction established China Human Settlements and Environment Award and China Human Settlements and Environment Award for Best Practices in April 2000. Those awards will award the cities, towns, villages, and individuals that have made outstanding contributions to the human settlement in order to improve the urban and rural environmental quality, improve the overall function of the cities and towns. Those awards will be selected once a year and will be recommended by the relevant department of provinces, autonomous regions, and municipalities. The Ministry of Construction will organize the evaluation of the selection committees and the final decision will be made by the Ministry of Construction.

On December 28, 2001, the Ministry of Construction announced the winners of the first China Human Settlements and Environment Award and the China Human Settlements and Environment Award for Best Practices. Five cities including Shenzhen received the China Human Settlements and Environment Award, and 28 projects such as Beijing Air Pollution Control and Environmental Comprehensive Improvement received the China Human Settlements and Environment Award for

Best Practices.

From 2001 to 2017, a total of 43 cities won the China Human Settlements and Environment Award, and a total of 623 projects won the China Human Settlements and Environment Award for Best Practices. At the same time, the Ministry of Construction selected some outstanding projects from which recommended the UN-Habitat Award and the Dubai International Award for Best Practice to Improve the Living Environment to UN-Habitat. According to statistics, from 1990 to 2018, China has won the UN-Habitat Award and the UN-Habitat Award for Special Honors 23 times. From 1996 to 2017, China has 136 projects respectively won the Dubai International Award for Best Practices, Good Forms Award, and Encouragement Award, of which 7 projects won the title of The Best Top Ten in the World. China's remarkable achievements in the field of human settlements have won wide acclaim and recognition from the international community.

(1) Tangshan City won the UN-Habitat Award

The Tangshan Municipal Government won the UN-Habitat Award in 1990 for its outstanding achievements in the earthquake relief, the reconstruction of Tangshan City and the settlement for millions of people. Tangshan's earthquake with 7.8 on the Richter scale in 1976 caused more than 240,000 deaths and 160,000 serious injuries. On May 14th, 1977, the State Council approved the Master Plan for Tangshan City Restoration and Development. The large-scale post-disaster reconstruction work began in the second half of 1979, and in 1986, by the 10th anniversary of the earthquake, 98% of the residents in the urban area moved into their new homes. On behalf of the UN Under-Secretary-General and the Executive Director of the UNCHS, Dr. Arcot Ramachandran, the United Nations Development Program Office in Beijing at the award ceremony presented the award to the Mayor of Tangshan and praised: "The award to the Tangshan Municipal Government is to reward Tangshan's large-scale construction and outstanding achievements after the 1976 earthquake. This is an outstanding example of solving the problems of housing, infrastructure, and services with science and enthusiasm. The Tangshan's experience shows that the active participation of citizens will play an important role in improving the living conditions of humans after the disaster."

(2) Anhui Province won the Dubai Award for the post-disaster reconstruction in rural areas

The post-disaster reconstruction in rural areas of Anhui Province, selected by the international jury for Dubai International Best Practice Award from more than 600 projects recommended by more than 80 countries, received the Dubai International Best Practice Award for Improving Living Environment

in 1996. The award ceremony was held at the UN-Habitat II. In the summer of 1991, the extensive large-scale widespread of Yangtze-Huaihe river basin in China suffered from catastrophic floods. 2.78 million housing units in Anhui Province only collapsed. Among them, the affected population accounted for 70% of the total population of those areas. Shortly after the disaster, the central and local governments actively implemented strategies to fight disasters and improve the residents' settlements and environment. Thanks to the active participation of the affected residents, this strategy achieved remarkable results. In just five years, 95% of the affected residents moved into new homes.

(3) The Funan River Comprehensive Improvement Project won three awards

The Funan River Comprehensive Improvement Project won 1) the UN-Habitat Award in 1998; 2) the Funan River Renovation and Urban Residential Environmental Improvement Project won, in 2000, the Local Government Initiative Award jointly established by the International Local Environmental Pioneer Committee, the United Nations Commission on Sustainable Development, and the United Nations Environment Program; and 3) the Dubai International Best Practice Award for Improving the Living Environment in 2000.

Fuhe and Nanhe are two tributaries of Minjiang River. They meet in Chengdu and flow surround the city center with 29 kilometers long as a river named as Funan River. Funan River has various functions such as irrigation, water supply, shipping, drainage, flood discharge and entertainment. Before the development of the Funan River Comprehensive Improvement Project, most of the original functions of Funan River lost due to the rapid growth of urban population and economy and the increasingly obsolete infrastructure. In addition to the certain flood discharge capacity, it basically became a black and odorous water body that discharged industrial wastewater and domestic sewage. About 100,000 residents lived in shacks on the banks of Funan River, which was low in humidity and lack of sanitation facilities, and was threatened by poverty, disease and crime.

The Funan River Comprehensive Improvement Project was fully launched in 1994. In order to improve the settlements, the project includes river regulation, sewage interception, shantytown renovation, road and pipe network, riverside greening, ancient city culture development and so on. The comprehensive improvement project took into account economic, social and environmental benefits and supposed to become the model for sustainable development of the city.

(4) The objective of urban development and the creation of good human settlements

On March 15, 2001, the Fourth Session of the Ninth National People's Congress approved the Outline of the Tenth Five-Year Plan for National Economic and Social Development. The first section of Chapter IX, "Implements the urbanization strategy, promotes the common progress of urban and rural areas" indicated: "Strengthen urban infrastructure construction and improve functions such as urban residence, public services, and community services. Focusing on creating good human settlements, we will strengthen urban ecological construction and comprehensive pollution control to improve the urban environment. Strengthen urban planning, design, construction, and comprehensive management, form distinctive urban styles, and comprehensively improve urban management."

"The urban work should take the creation of good human settlements as the central goal, and strive to build the city into a beautiful home where people and people live in harmony with nature" addressed by President Xi Jinping in the Central City Work Conference held in Beijing in 2015.

"To create better human settlements", and "public services involving education, culture, sports, healthcare and elderly care should be improved. Residential land and its supporting infrastructure should be reasonably arranged regarding population distribution. Increasing housing supplies through multiple channels is encouraged, and comprehensive governance over the urban and rural environment will be strengthened." Those requirements will be always in the State Council approval for the urban master plans since 2016.

2.3 Practice activities of Tsinghua team for the Science of Human Settlements

Mr. Liang Sicheng (1901-1972), the famous architect, was no doubt put forward the "physical environment" theory as the ideology of Tsinghua architecture education as he founded the Department of Architecture of Tsinghua University in October 1946. He said: "The so-called physical environment, it is from one lamp and one inkstone, one cup and one dish, to the whole city, to several cities in a region, to establish cultural, political, industrial and commercial relations for human life and work."

Since the 1980s, Wu Liangyong has inherited and carried forward Mr. Liang's architectural thoughts and proposed The General Theory of Architecture and the Science of Human Settlements to meet the new

requirements of the times.

In the new century, the School of Architecture of Tsinghua University has gradually established new ideology and goals of its education on architecture, “based on the human settlements, exploring Chinese characteristics, and being among the best in the world”. Under the guidance of the science of human settlements, the School has concerned with the major issues of urban and rural development in China, and has insisted on the combination of theory with practice, the study of the frontier topics of discipline development at home and abroad, and exploration of new theory and method. Adhere to the combination of teaching, scientific research and practice, and continuously achieve new achievements in the practice of building human settlements in China.

(1) The project of Ju'er Hutong neighborhood in Beijing

“The Ju'er Hutong Courtyard Housing Project is pioneering a new approach to urban renewal in the heart of Beijing. Traditional courtyard housing is being restored and improved, avoiding the need for wholesale demolition of historic but dilapidated inner-city housing. Equally importantly the project seeks to bring about a new approach to the funding and planning of housing provision within historic cities.” (World Habitat Awards, 1993)

Wu Liangyong presided over the Ju'er Hutong Courtyard Housing Project with a group of teachers and students from the School of Architecture of Tsinghua University in 1987. As the one of the first pilot projects for the renovation of old cities and the combination of dilapidated and dangerous housing reforms, the project occupied a land area of 8.28 hectares in Ju'er Hutong in location of the inner Beijing, only one block away from Di'anmenwai Street on the central axis of the city and is a part of Nanluoguxiang neighborhood near the Bell and Drum Towers. Based on the field surveys and residents' participation in the reconstruction, Wu Liangyong with his team reconsidered the previous planning policies and planned and designed the restoration and improvement of this sort of historic areas in Beijing.

Actually, Wu Liangyong preferred to call the project The Project in the Ju'er Hutong Neighborhood rather than the Ju'er Hutong Courtyard Housing Project, as he gave the title, *Rehabilitating the Old City of Beijing: A Project in the Ju'er Hutong Neighborhood* (1999), to his book.

Since the beginning of the year, the project with the assistance of the Beijing Housing System Reform Office established new approaches to the funding of housing provision in China as well as developing successful collaboration between local government, residents and academics in the

provision of new and improved housing and living conditions in some of the poorest areas of Chinese cities. Under the Ju'er Hutong experiment, the cost of rehabilitation is shared between the local government, the residents and the work units where the residents work. Existing residents are entitled to a discounted price to encourage them to stay in the project. Those who do not wish to stay are provided with good quality alternative accommodation. Any flats remaining after the needs of existing residents have been met are sold at the full market price, thereby recouping the costs incurred and generating a surplus to enable further work to be carried out.

A further innovative aspect of the project is the degree of cooperation and collaboration that has been fostered and encouraged in the process of neighborhood renewal. Planning and design have been carried out in close cooperation with all those involved and project implementation has been facilitated by a close relationship between the residents, architect/planners, and the local government. A housing cooperative has been formally established and is supported by the residents.

In the two phases of the project, 13 new courtyard houses were built, and 15,000 square meters of new houses were built, which improved the living conditions of the original 236 households. The experiment is now regarded as a model for future development by the Beijing city government, providing as it does an effective approach in both design and policy implementation for historic areas of the city.

(2) Research on the rural and urban spatial development planning for the Greater Beijing Region

The Greater Beijing Region (Jing-Jin-Ji), also known as Beijing-Tianjin-Hebei, is the national capital region of China. It is one of three biggest urbanized megalopolis regions in China; the other two are the Pearl River Delta in the south and the Yangtze River Delta in the east. It includes an economic region surrounding the municipalities of Beijing and Tianjin, along the coast of the Bohai Sea.

At the turn of the century, however, the region was plagued by various problems of its own development such as, especially the “urban disease” caused by excessive urban functions in the capital Beijing, and the disparate and uneven in the regional development while facing the challenges of global urban competition.

In 1998, under the leadership of Wu Liangyong, the research team of Tsinghua University carried out the continuous research work on the Rural and Urban Spatial Development Planning for the Greater Beijing Region (Beijing, Tianjin, and Hebei). Meanwhile, it is one of the major research subjects of the National Natural Science Foundation, “Basic Theory and

Typical Example of Sustainable Human Settlements of China” and a key research project of the Ministry of Construction. Moreover, it is also funded respectively by the “985” Research Fund of Tsinghua University.

The research used of the “Scientific Community” model of multidisciplinary, inter-departmental and large collaboration. With the cooperation of relevant departments and different professions, 21 institutions and nearly 200 experts have participated in it. In 2002, 2006 and 2013, Wu Liangyong and the research team published the first, second and third reports of the Research on the Rural and Urban Spatial Development Planning for the Greater Beijing Region (Beijing, Tianjin and Hebei). It studied the key issue of human settlements, and also seeks common policies and paths for transforming the current development mode from the perspectives of a regional urban-rural spatial pattern, a comprehensive transport system, an ecological civilization construction, a regional cultural system, etc., and proposes some specific suggestions for the joint development of a beautiful environment and harmonious society.

Synchronized with the transformation of the national development mode, the research team proposed the planning paradigm with regional coordination as the core. It is the first successful large-scale regional planning exploration in the new era. It is the specific theory of human settlements in the urban and regional levels. Application has important guiding significance for national urban and regional planning work. The comprehensive results of the research were exhibited at the National Museum of China in the November of 2014, and won the first prize of Huaxia Construction Science and Technology in 2016.

(3) The compilation of the Science of Human Settlements Discipline for *Encyclopedia of China*

As the Editor-in-Chief for the Science of Human Settlements Discipline, Wu Liangyong indicated, in the meeting for the compilation of the Science of Human Settlements Discipline for *Encyclopedia of China* in 2015, that *Encyclopedia of China* (Third Edition) specially established the Science of Human Settlements Discipline, which includes three branches, architecture, urban-rural planning and landscape architecture. It is unprecedented in the encyclopedic history, and will further show the general trend of this scientific development.

On June 10, 2015, the General Editorial Committee of the Encyclopedia of China sent a letter to Tsinghua University, stating that “through multi-party research, expert recommendation, and discussion by the *Encyclopedia of China* (Third Edition) Steering Group, special enrollment of Academician Wu Liangyong as the Editor-in-Chief for the Science

of Human Settlements Discipline (including architecture, urban-rural planning, and landscape architecture).”

The *Encyclopedia of China* is a national-level large-scale publishing project and an important basic, landmark and innovative project for China’s scientific and cultural undertakings. The third edition of the *Encyclopedia of China* is a new encyclopedia of the digital age. It is a national large-scale public knowledge service platform based on information technology and the Internet for knowledge production, distribution and dissemination.

(4) The establishment of the Academy of Human Settlements in Tsinghua University

The Academy of Human Settlements with the initiative and specific guidance of Wu Liangyong was established in Tsinghua University on December 13, 2015. It would be the first think tank in China’s human Settlements field.

The orientation of the Academy is a public platform for the academic exchange in relation to the theory and practice of human settlements at home and abroad. It is an academic community that brings together relevant experts and scholars in various fields. The purpose of the Academy of is to study the scientific theories and practical cases of the development of human settlements and to provide counseling and knowledge dissemination for the development of human settlements and urbanization in China and the world. Wu Liangyong recommended a total of 82 people as the first members of the Academy.

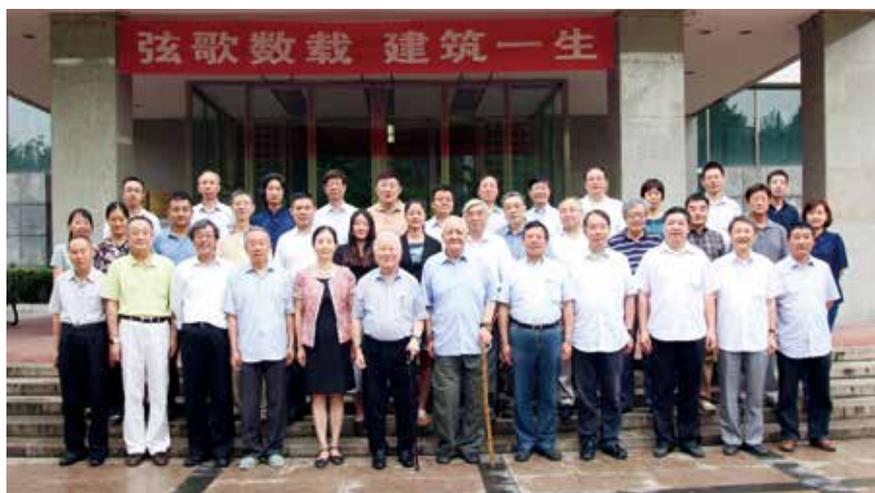


Figure 3. The group photograph of all conventioners in the meeting for the Compilation of the Science of Human Settlements Discipline for *Encyclopedia of China* in 2015

In the inaugural meeting of the Academy and the Science of Human Settlements Forum 2015, Wu Liangyong reviewed the history of the creation of the science of human settlements. He argued that in the new era when the country entered the development of thinking tanks, we had the responsibility to reply to this call to establish the Academy of Human Settlements. The development direction of the Academy would be: to rise up the development of human settlements with the core of architecture, urban-rural planning and landscape architecture to the height of the national strategy and action plan; to grasp the scientific direction and social pursuit of building a better human settlement, and jointly create a beautiful livable and harmonious society; to emphasize on the planning and design of cities and countryside, and open up new areas of spatial planning; in term of the discipline development, to encourage the coherence and innovation of the three first-level disciplines of architecture, urban-rural planning, and landscape architecture, and to take the academic development path with Chinese characteristics.

Wu Liangyong urged the Academy of Human Settlements to be the integration on research and teaching as far as Tsinghua University is concerned, and to create a conception of human settlement with Chinese characteristics, to be in accordance with natural laws and social laws. With reference to the theory of complexity science, the science of human settlements will be the combination of natural sciences, humanities, and arts. The paradigm the science of human settlements is looking for will be suitable to our real conditions as the integration of all developments such as political, economic, social, human, ecological, transportation, architecture, planning, landscape, energy, etc.

3 Conclusion

Wu Liangyong received the medal of Reform Pioneer for celebrates 40th anniversary of reform and opening-up in 2018, as I completed the article.

“The reform is developed by reverse transition”, Wu Liangyong observed in retrospect the creation of the science of human settlements. He indicates in his book *Exploration of Liangyong* (Tsinghua University Press and People’s Publishing House, 2016): “The Science of Human Settlements is the real problem-oriented in China, and that is starting from the reality of China’s development. The Science of Human Settlements engages with the wisdoms from related disciplines and consciously seeks out the ‘new paradigm’ of urban and rural human settlement development, and constantly promotes theory development. It can be said that the scientific study at any level is not isolated and must use all knowledge and cognitive achievement, and to accumulate

academics and to develop a common knowledge system with the solution of common concerned problems, that is, ‘raise a question—strive to solve it.’”

Beyond dispute, the theory and practice of the Science of Human Settlements has become one of the landmark achievements of the 40th anniversary of reform and opening-up in China. Indeed, it is its achievements that drove me to write this article. **UIPI**

References

- [1] 吴良镛. 人居环境科学导论 [M]. 北京: 中国建筑工业出版社, 2001.
- [2] 童寯. 新建筑与流派 [M]. 北京: 中国建筑工业出版社, 1980.
- [3] ZHOU Y Y. Human settlements in The People's Republic of China[J]. *Ekistics: The Problems and Science of HUMAN SETTLEMENTS*, 1987, 54(322).
- [4] Mega-cities ... and mega-city regions 1: Asia[J]. *Ekistics: The Problems and Science of Human Settlements*, 1997(385/386/387).
- [5] 吴良镛. 广义建筑学 [M]. 北京: 清华大学出版社, 1989.
- [6] 吴良镛, 周干峙, 林志群. 我国建设事业的今天和明天 [M]. 北京: 中国城市出版社, 1994.
- [7] 吴良镛. 北京旧城与菊儿胡同 [M]. 北京: 中国建筑工业出版社, 1994.
- [8] 吴良镛等. 京津冀地区城乡空间发展规划研究 [M]. 北京: 清华大学出版社, 2002.
- [9] 《人居进展》编辑部. 人居进展 (创刊词)[J]. *人居进展*, 2016(1): 1-4.
- [10] 吴良镛. 良镛求索 (中国工程院院士传记) [M]. 北京: 清华大学出版社, 2016.

Bibliography

- [11] WU Liangyong. Rehabilitating the old city of Beijing: a project in the Ju' er Hutong neighbourhood (urbanization in Asia)[M]. University of British Columbia Press, 1999.
- [12] WU Liangyong. Conservation and development in the historic city of Beijing[J]. *Ekistics*, 1997, 64(385/386/387): 240-246.
- [13] WU Liangyong. Coping with urbanization in China: The role of the sciences of human settlements and planning practice[J]. *Ekistics*, 2006, 73(436-441): 196-206.
- [14] WU Liangyong. Development strategies for Beijing: the need for a holistic approach[J]. *Ekistics*, 1997, 64(385/386/387): 198-202.
- [15] WU Liangyong. The need for the study of mega-cities and mega-city regions in Asia[J]. *Ekistics*, 1997, 64(385/386/387): 166-167.
- [16] WU Liangyong. Protecting the heritage of historic cities: a challenging task[J]. *Ekistics*, 1987, 54(322): 14-27.
- [17] WU Liangyong. Sciences of Human Settlements: searching for the theory and practice[J]. *Ekistics*, 2002, 69(415/416/417): 279-284.
- [18] WU Liangyong. Sustainability of mega-city regions in China: the future of Beijing, Shanghai, and Guangzhou[J]. *Ekistics*, 1997, 64(385/386/387): 182-188.
- [19] WU Liangyong. Beijing at a crossroads – a new concept for Greater Beijing[J]. *Ekistics*, 1998, 65(388/389/390): 57-64.
- [20] 吴良镛. 京津冀地区城乡空间发展规划研究 (二期报告) [M]. 清华大学出版社, 2007.
- [21] 吴良镛. 京津冀地区城乡空间发展规划研究 (三期报告) [M]. 清华大学出版社, 2013.
- [22] 吴良镛, 吴维佳. “北京 2049” 空间发展战略研究 [M]. 清华大学出版社, 2012.
- [23] 吴良镛. 吴良镛论人居环境科学 [M]. 清华大学出版社, 2010.
- [24] 吴良镛. 吴良镛城市研究论文集——迎接新世纪的来临 [M]. 中国建筑工业出版社, 1996.
- [25] 吴良镛. 人居环境科学导论 [M]. 中国建筑工业出版社, 2001.
- [26] 吴良镛. 中国人居史 [M]. 中国建筑工业出版社, 2015.
- [27] WU Liangyong. Urban conditions – process – housing regeneration, old Beijing[J].

- The Architectural Review, 2000, 207(1236): 73.
- [28] WU Liangyong. The science of human settlements in China[M]. Paramus, NJ: Homa & Sekey Books, 2015.
- [29] 吴良镛. 中国建筑与城市文化 [M]. 北京: 昆仑出版社, 2009.
- [30] WU Liangyong. China housing 2000: inner-city, organic renewal for Xin-Tai-Cang neighborhood in old city of Beijing: outer-city, creative housing city for Beijing at BDA[M]. Beijing: Institute of Architectural and Urban Studies, School of Architecture, Tsinghua University; Seoul: Archiban, cop., 2003.
- [31] WU Liangyong. A brief history of ancient Chinese city planning[M]. Kassel Gesamthochschulbibliothek, 1986.
- [32] WU Liangyong. Architecture in the new millennium[J]. The Journal of Architecture, 2000, 5(1): 9-19.
- [33] WU Liangyong. Architettura integrate[M]. Roma: Nuova Cultura, 2013.
- [34] 吴良镛. 国际建协《北京宪章》——建筑学的未来 [M]. 清华大学出版社, 2002.
- [35] 吴良镛. 广义建筑学 [M]. 清华大学出版社, 1989.
- [36] 吴良镛, 周干峙, 林志群. 我国建设事业的今天和明天 [M]. 中国城市出版社, 1994.
- [37] 童寯. 新建筑与流派 [M]. 中国建筑工业出版社, 1980.
- [38] 周干峙. 我所理解的吴良镛先生和人居环境科学 [J]. 城市规划, 2002(7).
- [39] 毛其智. 从广义建筑学到人居环境学——记两院院士、清华大学教授吴良镛 [J]. 长江建设, 2000(3): 6-9.
- [40] 武廷海. 吴良镛先生人居环境学术思想 [J]. 城市与区域规划研究, 2008, 1(2): 233-268.
- [41] Editorial Office of Human Settlements. Human Settlements. Related articles from 1992 to 2018.

About the author: **Dr. Mao Qizhi** is a professor at Tsinghua University. Email: qizhi@mail.tsinghua.edu.cn

About the translator: **Ye Qimao** is a Certified Practicing Planner in Australia.

(Edited by Qin Yi)