

Potential Infrastructure of Dynamic Consistency for Sustainable Development of Urban and Rural

—Strategic Path of Urban and Rural Planning with Chinese Characteristics

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Abstract—In order to ensure the future strategic safety of sustainable development of urban and rural construction, this paper, based on the new characteristics of urban and rural development in China along with the associated theoretical and practical exploitation over the past ten years at the beginning of this century, proposes the concept of potential infrastructure of DC-ACAP for sustainable development of urban and rural from the perspective of dynamic consistency, and believes that developing DC-ACAP is the basic task of urban and rural development. By analyzing the industrial transformation and revolution and the historical materialism which not only promotes but also constraints comprehensive social development, it further concludes that China is at a critical phase of urban and rural development unprecedented for thousand years, and with consistent continuous innovation and regressive system upgrade in such phase, China will find a strategic path of urban and rural development with Chinese characteristics - towards Original Human Settlements.

Keywords—Sustainable Development; Urban Planning; Dynamic Consistency (DC); Potential Infrastructure (DC-ACAP); Original Human Settlements

I. INTRODUCTION

Since the first urbanization process in the middle of 18th century in British, the world has undergone three stages of urbanization: early stage (1760—1850), local development stage (1851—1950), overall development stage (1950 to now). In 1950 when the world's urbanization level was 29.2% and since then this figure has increased to 34.2% in 1960, 37.1% in 1970, 39.6% in 1980, 42.6% in 1990, 46.6% in 2000, and 51.8% in 2010. In the first ten years of 21st century when the world's population is over six billions, the urbanization has exceeded 50%.

In China, the urbanization level was 50% in 2011 and 52.6% in 2012 as compared with 78.5% in America, 80% in German, and 76% in Japan. In the article “The Urban Challenge” published on Science in June 2012, the author worries that “urbanization has continued around the world, sometimes diminishing rather than enhancing social and environmental capital” and “one study of global data for cities sounds the warning: as urban population grows, major innovation cycles have had to be generated at a continually accelerating rate to sustain growth and so avoid stagnation or collapse. The urban citizen is running with no time to take breath” [1]. For the development mode in China, Pan Jiahua stated in From Industrial Toward Ecological in China that “since the 1992 Rio summit, China has been on the fast track to industrialize and urbanize, having transitioned from a low-income developing country into the second-largest economy in the world”, and “in many aspects, China is accelerating the transition from industrial to ecological civilization”. However, it also stated that “Although China has met the millennium goals for poverty reduction, there have been increasing disparities between rich and poor, rural and urban, and coastal and inland regions. Concerns are growing over water availability and pollution, land degradation, depletion of exhaustible resources, and so on. China has no choice but to lead the way for a new paradigm of sustainable development” [2].

Due to the huge population and vast rural areas, and development unbalance between eastern and western areas, China faces heavy and arduous urbanization tasks, and the urbanization level should not be taken as the only goal. Since 1990s till now, the urban development in China can be divided into three phases: “urban-rural integration”, “building a new socialist countryside”, and “new-type urbanization”. In the

future, it is necessary for China to find a strategic path of urban and rural development and urbanization which is suitable to the actual Chinese situations.

II. BASIC DIRECTION AND TASK OF URBAN AND RURAL PLANNING AND DEVELOPMENT IN CHINA

Urban-rural planning theories and practices undertake different missions and tasks and present different directions and tendency in different countries, background, and phases, which can be concluded as the "transfer of practical foundation and focus of attention of urban planning" ("Thought on Principles of Urban Planning", Wu Zhiqiang, 2007). At this moment, Chinese cities are burdened with great and important tasks and historical missions (Zou Deci, 2005). "Competition from economic globalization, constraints from resource shortage, pressure from fast urbanization, and concerns brought by huge urban problems" has brought great challenges, and "the transformation of economic system will certainly involve the change in political institution, mechanism, management, mode and social, cultural and education fields, especially the profound changes in views. In turn, such changes will inevitably influence the concept, principles, and methods of urban planning. China is undergoing this process now" ("City Development and Planning of China in New Times", Zou Deci, 2005). So it is definite that China's urban planning has come to a turning point (Wu Zhiqiang, 2007). Looking back upon more than the ten years at the begging of this century, what guiding ideologies of should we follow in the theories and practices of urban planning in such a critical period? In the authors' opinion, the following three must be adhered to: (1) sustainable development; (2) serving for the fundamental interests of the people; (3) urban development strategy taking all factors into account ("Scientificity of Urban Planning", Zou Deci, 2007). Then, how to put these ideologies and principles into practice to clarify the basic characteristics and directions of urban planning in China? Through analysis, the authors conclude that sustainable development path of urban development in the transitional phase should be taken as our basic direction and task. With this basic direction established, the three guiding ideologies above can be put into practice and more importantly; this can be taken as an important opportunity and breakthrough of urban planning in China. The analysis is described below in detail.

III. POTENTIAL INFRASTRUCTURE OF URBAN AND RURAL SUSTAINABLE DEVELOPMENT-DC-ACAP

A *Connotation of DC-ACAP*

It took about 110 years (1760s to 1870s) from the first industrial revolution to the second and 80 years (1870s to 1940s or 1950s) from the second to the third. According to the acceleration characteristics of technology and industrial civilization, the fourth industrial revolution, a fundamental transformation, will occur in 20-40 years or shorter, the middle of this century. In the history, the three industrial revolutions

not only promoted technical and cultural development, but also caused serious environmental deterioration. Considering this, the International Council of Scientific Unions (ICSU) initiated International Biological Plan (IBP, 1964-1974) in 1960s, the first ten years of the third industrial revolution, marking the beginning of extensive study of on natural ecological system. In 1970s, the researchers started to correlate the ecological study to human activities with the aim of achieving more extensive cross-discipline actions, rather than being limited in the range of traditional biology. For example, United Nations Educational, Scientific and Cultural Organization (UNESCO) initiated the Man and the Biosphere Programme in 1972, the United Nations Conference on the Human passed the Declaration of United Nations Conference on Human in 1972, and in 1987, well-known famous ecological researchers all over the world, as represented by Mrs Brant, put forward the concept of sustainable development. Since then, sustainability became the greatest responsibility to achieve consistency of all countries, sectors, and levels. From the social background of sustainability generation and proposing we can see ecology is the essential source. At present, "the role of ecology in sustainability study is not limited to a subject, it builds a bridge between natural science and society (Odum1972, 1997)" (Li Wenhua, 2004). Especially the systematic ecology has provided an opportunity to achieve consistency between natural science and social science. Its increasingly wider study scope reflects the new needs of sustainable development, and provides important epistemology support. By analyzing the global development status based on ecology, we can find that the most imminent internal and external characteristics of the world are imbalance and uncertainty respectively, which constitute the deep-rooted inherent immanent cause and external inducement of all complicated problems. As such, how to achieve the Relationship of Dynamic Consistency has become the basic work of sustainable development, and how to adjust internal imbalance and mitigate external uncertainty to achieve overall dynamic consistency according to the requirements of sustainability will be considered as the core of sustainability for long. From the perspective of obtaining support from production relations and production capacity, common agreement and mechanism of dynamic consistency should be established and improved on different levels to adjust the production relations, and on the other hand, action adjustment of science and technology evaluation and application must be promoted to adjust the production capacity. In general, with such adjustment, the production capacity and production relations are expected to support and supplement each other, forming the only reliable DC-ACAP for sustainable development of urban and rural. This paper proposes the DC (Dynamic Consistency) based ACAP mode from the adjustment of production relations along with the production capacity with an aim to achieve overall consistency. We hope to provide a perspective of sustainable development in urban and rural planning for discussion. DC-ACAP is composed of four stages (Fig.1):

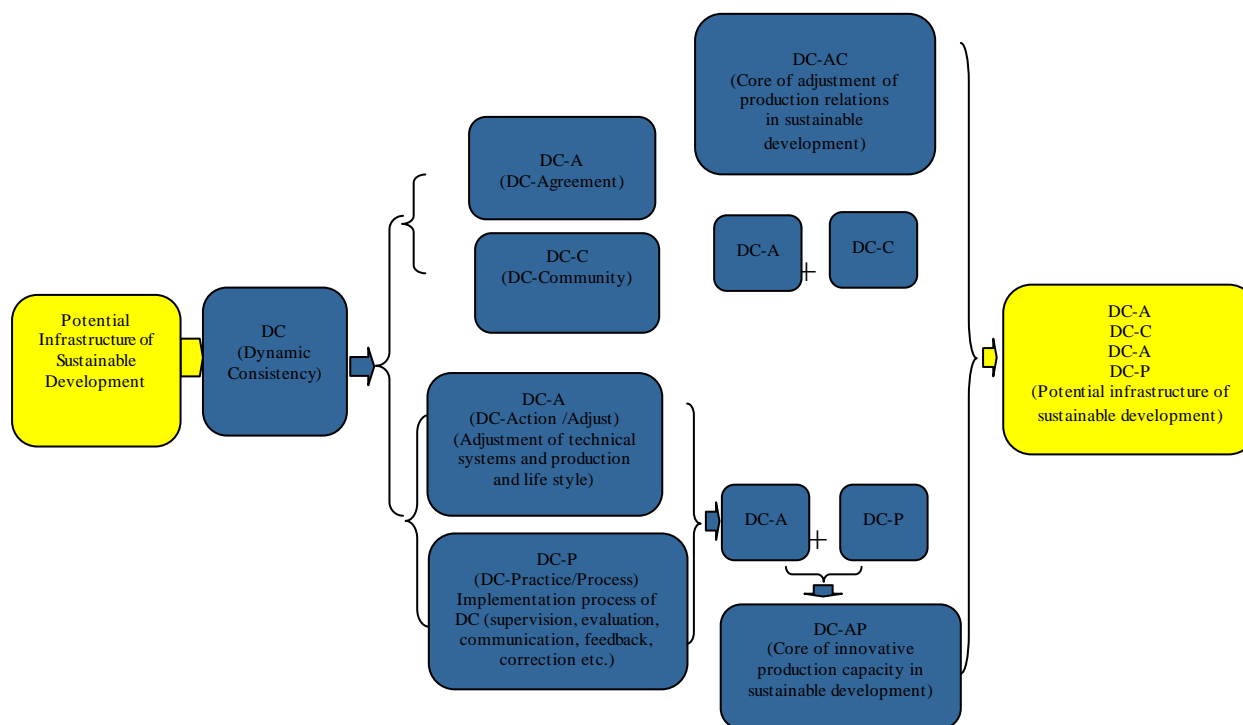


Fig. 1. Analysis of DC-ACAP

(1) Stage 1: Agreement of Dynamic Consistency (DC-A);

(2) Stage 2: Community of Dynamic Consistency (DC-C);

The application of (1) and (2) in urban and rural planning mainly refers to study on the scientificity and social process of rural urban planning, that is science + society.

(3) Stage 3: Action/Adjustment of Dynamic Consistency (DC-A);

(4) Stage 4: Practice/Process of Dynamic Consistency (DC-P).

The application of (3) and (4) in urban and rural planning mainly refers to study on the technology and society of rural urban planning, that is technology + society.

Significance of DC-ACAP (items 1 to 4 above): With the processes of flexible negotiation, joint innovation, adjustment actions, and continuous practice, DC-ACAP enables to achieve a new development mode to mitigate internal imbalance and external uncertainty for any regions, cities, and rural-urban fringe zones under imbalanced development from micro to macro and from different levels.

B Application of DC-ACAP in Urban and Rural Sustainable Development

In the transition period of urban and rural planning,

China faces great difficulties and challenges: (1) “confusion on scientificity, proper system, role dislocation, isolation from international mode” (Difficulties and Solutions of China Urban Planning in Transition Period, Yao Xiuli, Wang Hongyang, 2006); (2) “Observations on the urban construction in institutional transformation show that sound developed urban construction are constrained by both planning and market, being lack of any of which will cause to poor construction. Planning is intended to establish the importance of urban planning in the construction system by emphasizing that urban construction should be constrained by both planning and market” (Development Planning – Strengthening Mechanism of Urban Planning, Zheng Jieming, 2008); (3) “It is concluded that the operation of urban planning in China is a limited rational process” (Planning Rationality of China Urban Planning in Transition Period, Liu Yiyun, Feng Man, 2009). Based on this, the application of DC-ACAP in urban and rural sustainable development lies in the following three aspects: (1) DC-ACAP helps to integrate the science, technology, and social processes of urban and rural planning into one dynamically consistent process; (2) DC-ACAP helps to integrate the production relations (“Agreement of Dynamic Consistency” and “Community of Dynamic Consistency”) and production capacity (“Action/Adjust of Dynamic Consistency” and “Practice/Process of Dynamic Consistency”) into one dynamically consistent process to improve and support healthy and sustainable development of the whole society; (3) DC-ACAP is

applicable to any construction in practice, which can promote and adjust the stable and sustainable development of the entire society in a fundamental and continuous way.

IV. FURTHER IDEAS – TO PROMOTE REGRESSIVE SYSTEMATIC UPGRADE TOWARDS ORIGINAL HUMAN SETTLEMENTS

Until now, industrial revolution has experienced two internal transformations (from steam engine to electric power, and from electric power to molecular, atom, space and genetic technology), and accordingly, the life style of human being has also undergone two changes (from gathering and hunting to agriculture, and from agriculture to industry). According to the theory about abolition of dialectical materialism, abolition will face regressive systematic upgrade in the third transformation (Fig.2). Therefore, the mode of production and life of human being and the society will inevitably experience a regressive systematic upgrade, which is a more advanced production and life mode integrated with nature, called “Original-Industry” or “Odustry” style and “Original-Society” or “Ociety”. The core of “Original-Industry” is “Original- Production” (or “Oduction”) with the critical and substantive characteristic of “comprehensive development

based on harmonic between human and nature” distinct from industrialized production mode. “Original-Industry” production mode will assist human beings to accomplish a new transformation and upgrade to achieve all-round development. Such a transformation will necessitate update of all production and life modes and create more sustainable, original, and advanced productivity level (Chen Taifu, 2000; Wang Dan, 2000; Gao Anqi, 2002; Yang Wensheng, Jiao Cunzhao, 2006; Kuang Limin, 2008; Ding Xiangyan, 2009). “Human- orientated comprehensive development” is not a one-sided value ignoring natural environment” because “Humanism” is a broad concept integrating the relationships of man to nature and man to man, rather than taking human being as the center simply (Kang Yanhong, Zhang Jingxiang, 2006; “Humanized Urban Public Space”, Zou Deci, 2006; Renaissance under Fast Urbanization, 2007). Therefore, actions based on the core value of “human-oriented comprehensive development” necessarily have the overall characteristics of sustainability, and the potential infrastructure of dynamic consistency will provide powerful support and promotion for sustainable development to advance and achieve original production and life. Thus the urban and rural development will come to a systematic upgrade and development stage “Original- Industry”

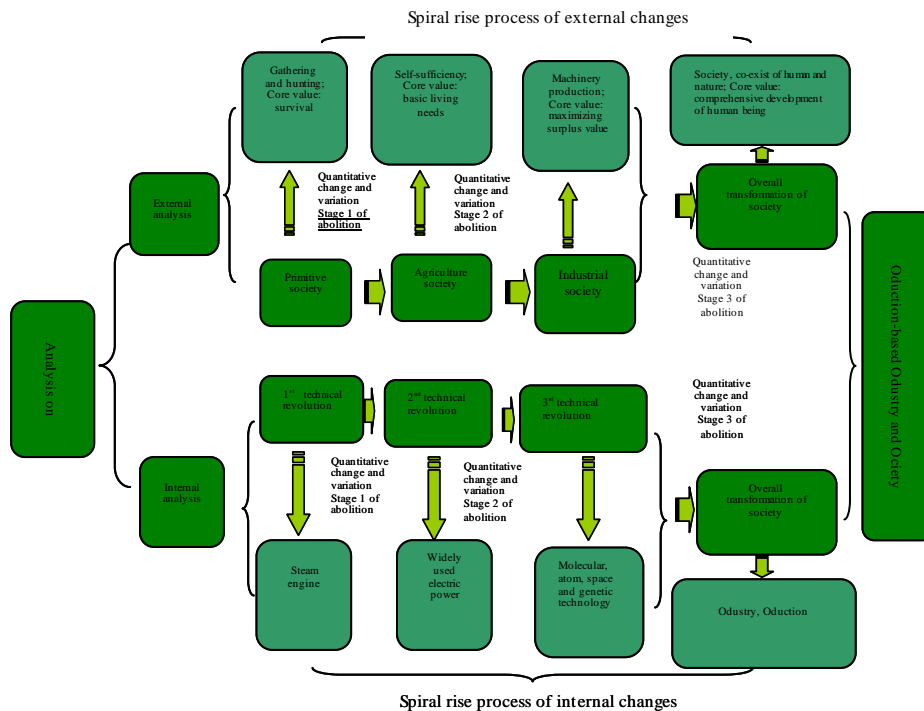


Fig. 2. Analysis on path to neo Odustry and neo Ociety

Original Human Settlements and Original-urbanization (or obanization) are the reaction of collision between eastern and western cultures. As compared with the western culture which lays particular stress on locality and emphasizes “legal principle” and “contract” featured with rationality, logic, and personality, eastern culture highlights globalization characteristics and focuses on “reason sense” and “strategy” featured with non-rationality, randomness,

and similarity. In Chinese culture, the idea “Yin is contained in Yang, not opposite to Yang” is a typical holism opinion, which can be considered as the source of non-rational philosophy. Thus, the eastern culture history can be taken as a non-rational history in which rationality and laws are just supplementary means or tools. In the later of 19th century, irrationalism thoughts represented by Hegel appeared, reflecting that western culture starts to learn the eastern

culture after experiencing the pains of the second world's war and the ecological problems. In such a sophisticated situation of globalization, we must become aware that the emphasis of revolution and opening and development is to learn the achievements in rationality (rather than non-rationality) in western culture, that is logic, science, and contract, and carry forward the traditional non-rational culture advantages. So the development trend of China in future will necessarily focus on non-rationality while absorbing more western rationalism achievements. Such a trend reflects the value characteristics of globalization and complexity and similarities, which are consistent with the general characteristics of "O-production (or Oduction) and O-society(or Ociety)" [3,4,5] and absorb many rationality achievements reflecting locality and personality with an aim to achieve "grafting western branches to eastern root" (Ideas on Development of Chinese Urban Planning Theory, Liang Henian, 2009).

Before modern and contemporary times, the traditional material basis - agricultural production capacity for the urban and rural development remained stable and unchanged. However thereafter, the development of urban-type industry enhanced the level of material productivity of cities, providing strong material basis for city-village interfluvial and fast development of cities. At present, as the new technology revolution and new economy types emerge associated with the new information society, the distribution style of production capacity for urban and rural development changed dramatically. Accordingly, China's urban and rural construction will inevitably open up a critical development stage. Naturally, the conditions for new times urban and rural planning theory have been available. The internal conditions are the basis provided by Chinese thousand years' historical culture, especially the fast deposition in recent thirty years and the external conditions are the new industrial revolution and the resulting Original Human Settlements and Original-urbanization. To build the basis of ekistics in new times, we need to take the background of globalization into account to ensure the ekistics suitable for Chinese territorial process and geographical process, Chinese market and technical and economic process, and Chinese social culture and governance process. As such, the Original Human Settlement theory system with Chinese characteristics will be the important basis and content of Chinese urban and rural planning theory in 20 to 30 years.

For a great agricultural country which has developed for thousands of years, how to achieve dynamically consistent development at all levels between urban and rural regions and among eastern, central, and western regions after a short industrialization process and tremendous change of informatization upgrade is not only the responsibility, but also the potential and power of sustainable development. In general, we will certainly open up a new urban and rural development road with Chinese characteristics by developing and strengthening DC-ACAP and integrating and invoking more resources. According to the theory of eastern culture on healthy development, the growth of things needs Waiqi (external factors such as wind, cold, heat, humidity, arid, and fire), Zongqi (breathe, food,

photosynthesis), and congenital qi, which are integrated to Yuanqi (vitality). The theory and practice of urban and rural planning in China also need vigor to exploit the potential and power by promoting "Original Human Settlements" and "Original-urbanization". At present, our construction of human settlements environment and development of urban and rural planning are just in the critical stage of regressive systematic upgrade in the spiral rise process. So we have no choice but for "Original Human Settlements" and "Original-urbanization" to develop the theory and practice of urban and rural construction with Chinese characteristics.

V. CONCLUSIONS

Based on the thousand's years of evolution of rural and urban human settlements in China, this paper made comprehensive analysis and proposed the following preliminary conclusions for discussion: Firstly, the major material foundation for development of human settlements has transited from traditional agricultural pattern into post-industrial pattern which is also referred as modern information mode. As driven by such transition, the development of rural and urban human settlements would welcome a regressive system upgrade which was never seen in the past thousands of years. Secondly, as the potential infrastructure for achieving such regressive upgrade, DC-ACAP offers a driving mechanism which is transitional, adaptive, functional, connotative, flexible, cooperative, ecological, reparative, dynamic, and adjustable based on actual conditions. DC-ACAP does not recommend any arbitrary, formalistic, changeless, superficial, ragescent, onefold, ivory-towered strategies and ways which are divorced from regional conditions. Thirdly, the strategic development goal of rural and urban human settlements in China is to achieve Original Human Settlements. Original Human Settlements not only reflect the inherent nature and characteristics of the history and regional features of China, but also represent the natural transition of material production mode in the new times. Finally, the rural and urban human settlements of China are quite complicated and whose development and evolution are featured with internal unbalance and external uncertainty and may be blocked by major events. In view of this, the task of achieving healthy and stable development of the rural and urban human settlements still needs more attention and better preventive measures.

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