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Coordinated evaluation and development model of oasis urbanization from the perspective of new urbanization: A case study in Shandan County of Heixi Corridor, China

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ABSTRACT

"New urbanization", as a new proposition, has become an important strategy and direction in the progress of China's urbanization. Consequently, exploring the development pattern can be valuable for our academic study and practical work. This paper chose population urbanization and land urbanization as the research subjects, aiming to find the coordination between them and propose a development model. The results are as follows. (1) From 2000–2014, the composite indexes of population and land urbanization in Shandan County have shown an upward trend. The composite index of population urbanization has been higher than that of land urbanization from 2000 to 2012, but lower from 2013 to 2014. (2) The process of population and land urbanization has promoted the rapid development of Shandan County. The coordination between population and land urbanization has gone through four stages: disordered, transitional, moderately coordinated and highly coordinated stages. The final change from moderate incoordination to high coordination is a good transition but of low level. Therefore, there is a large room for transition of development. (3) We have proposed urban optimization by considering reasonable population transfer, intensive land utilization, reform of mechanism, and new type urban construction. The urbanization development models suitable for arid oasis areas in China have also been established, including comprehensive model of eco-industry, guiding model of cultural tourism, city-industry integration model, development model of new rural communities, and construction model of innovative cities. These results might provide useful references for the development of oasis cities in China.

1. Introduction

Urbanization is closely related to human development and promotes the progress of human society. Since the industrial revolution in Britain in the 18th century, social economy and urban spatial patterns have undergone tremendous changes. Cities and towns developed rapidly under the industrial revolution and gradually became the leading force in social production and life. This promote urbanization in the world and the resulted large-scale population transfer from rural to urban areas made the social management in cities increasingly complicated, so scholars began to explore the best city form (Perroux 1950; Berry 1975; Cuberes 2008). Since 1970s, developed countries have reached a high level of urbanization and counter-urbanization even occurred in USA and Western Europe, so the suburbs became the main population centers and more attention has been paid to urban-rural integration (Perroux 1950). For example, *urban and rural social equality*, *rational social system* and *the Communist village* of Simon (Simon 2004), Fourier (Fourier 2009) and Robert Owen (Owen 1965) have reflected the original conception of urban-rural integration. *Garden city* proposed by Howard (Howard 2011) is the origin of early urban-rural integration. Around 2000, the urbanization rate of high-income countries such as USA and Japan had reached 76–80% and modernization was achieved (Ye, Xu, & Yi, 2006). Overall, the progress of urbanization is healthy and steady. Since then, researchers have focused their attention on urban sustainability, compact city (Jenks, Burton, & Williams, 1996; Gordon and Richardson, 1997; Morrison 1998), healthy city, eco-city (Trade and Industry, 2003), and smart city (Campbell 1996; Vlahov and Galea 2002; Plümer and Trojan 2004; Jarrar and Ai-Zoabi 2008; Rosales 2011; Secondini, Wu, & Tondell, 2011). These studies reflect the ideas of human orientation, rural-urban integration, smart growth, intensive development, low carbon, and city innovation, which are consistent with the goals of New Urbanization in China. Successful experiences and profound lessons can be learned from Western Europe's market-oriented urbanization under the government regulation, USA's

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unrestrained and free urbanization, and the colonial economical urbanization in developing countries such as parts of Latin American and African countries (Qiu 2005). They can provide useful references for constructing a new urbanization model characterized by human orientation, urban-rural integration, industrial interaction, economical and intensive pattern, ecologically livable environment and harmonious development.

In China, the development of cities and towns was basically stagnant before 1949, and there was little research on urbanization. Since the reform and opening-up in 1978, with the shift of focus from rural to urban areas in China, urban development has become more rapid, and there have been more and more research results on urbanization such as the construction of small towns, the quality and dynamic mechanism of urbanization, the rules and direction of urbanization development (Zhang and Wang 2014). In the 21 st century, under the background of global economic integration, the economic development in China is faster than ever before, leading to significant improvement in comprehensive national strength, industrialization level, urbanization level and the integration of urban and rural construction (Yao, Zhang, Yu, Li, & Wang, 2014). China has experienced the largest urbanization process in the world during the past decade. In 2016, gross domestic product (GDP) of China reached 74.41 trillion CNY, making China become the second largest economic entity in the world following America, and the urbanization rate of China reached 57.35%, which is of the medium level among developing countries (Yao, Li, Yan, Chen, & Chen, 2012). In addition, the number of large cities with more than one million population has reached 65, meaning China has the largest number of megalopolises and large cities in the world (Duan, Yao, & Chen, 2013). The historical process underlying these great achievements is essentially the process of the expansion of urban construction land area, population size and urban space in China. On the one hand, industrialization and urbanization have fully promoted the economic and social development in China and improved people's living standards and housing conditions. On the other hand, with rapid urbanization, some severe problems such as soaring population, uncontrolled land use, decreasing farmland area, environmental pollution and degrading water-soil resources occur in China (Wu 1999). Urbanization appears to be an “aggressive” progress in many areas of China, resulting in a false appearance of prosperity. In fact, quality of citizens’ lives, quality of environment and quality of construction have received little attention, the high rate of population urbanization is kind of “illusion” and the fast “land urbanization” leads to excessive consumption of land and water resources (Yao, Feng, & Wang, 2011). Zhou Ganzhi, an academician, said that urbanization in China which lags behind that in developed countries is of low quality and, in other words, it only meets the quantity requirements but not the quality requirements (Zhou, 2006). In addition, China adopts “city-biased policy”, meaning that surplus subsidies from agriculture are used to promote industrial and urban development, so a many production factors and capital are concentrated in cities, promoting industrialization and urbanization but at the same time widening the developmental gap between urban and rural areas (Ye 2001; Gu, Wu, & Cook, 2012; Wang and Liu 2015). In order to address these challenges, Chinese Premier Li Keqiang, in 2012 Central Economic Work Conference, stressed that urbanization has the greatest potential to increase China’s domestic demand and China should adopt a new path of urbanization instead of the traditional path. The new urbanization is characterized by the coordinated development of urban and rural areas, urban and rural integration, industrial interaction, energy saving, intensiveness, livability and harmony. Urbanization should enable the coordinated development of large, medium and small cities, small towns, as well as new rural communities, whose developments mutually promote each other (National Development and Reform Commission, China 2016).

The new urbanization requires the transition from quantity to quality and from disharmony to coordination, preventing aggressive land urbanization and uncoordinated development of urban and rural areas (Yao, Lu, Chen, Li, Wang, & Wu, 2012). In November 2013, Chinese President Xi Jinping clearly pointed out that “urbanization refers not to land urbanization but to population urbanization”. From a perspective of people-land relationship, many problems in the urbanization process in the past can be attributed to the contradiction between people and land resources (Li and Luo 2014). In other words, the contradiction occurs because urbanization is based on limited resources and environment, and the unreasonable allocation of resources leads to wastes. The key of the contradiction between people and land resources is that we ignore the demands of people who serve as the main body of urbanization (Li, Deng, & Ma, 2015). Thus, the new urbanization requires us to explore new development model and to innovate new development ideas. Additionally, more attention should be paid to the important role of people in urbanization process (Wang 2010; Yao, Zhang, Yu, Li, & Wang, 2014; Yao, Wang, & Chen, 2015; Chen, Yao, & Zhang, 2016). At present, the research on urbanization mainly focuses on the coordination of population urbanization and land urbanization at national and provincial levels or in developed areas of China (Li, 2013a, 2013b ; Pan and Liu 2014; Cui 2014; Li, Fang, Wang, & Wang, 2015). Generally, research on the evolution of coordinated relationships at county level is scarce, and little attention has been paid to the coordinated development of oasis areas, which are special geographical units, under the background of new urbanization.

Oasis is a heterogeneous ecological landscape that is relatively stable and has significant microclimate effects. It is formed on the basis of a relatively large-scale biological community in a large-scale desert. City formed on this oasis is called oasis city. Oasis city is an ecological system where human activities (production and living) concentrate. It is influenced by natural and anthropological factors in arid area. Because of its geographical location, ecological environment and other factors, human-land relationship in oasis city is extremely sensitive (Du and Liu, 2005). County is the most basic administrative and economic unit in China. It is not only an important space for urban-rural coordinated development, but also a reasonable unit for promoting local urbanization. As an important part of China's urbanization process, county urbanization can effectively reduce the cost of urbanization in the whole society, match the spatial distribution of industries with that of labor force, promote employment and settle migrant workers. Therefore, the county urbanization plays a vital role in constructing new socialist countryside in the new period and a moderately prosperous society in all respects (Li, Yin, Zhang, Zhang, Gui, & Zhang, 2014). Shandan County is located in the middle of The Hexi Corridor, where water and land resources are scarce, economy is relatively weak and ecological environment is fragile. Shandan Country is a typical arid oasis area and has become an important subject for research on the urbanization of arid oasis cities. The new urbanization in Shandan County should be promoted and Shandan County’s unique advantages should be fully used so that its development can be rapidly integrated into the regional economic development.

Therefore, from the perspective of new urbanization, this paper used coupling degree model to evaluate the coordination relationship between population urbanization and land urbanization in Shandan County from 2000 to 2014. The particularity of urbanization in oasis county in terms of process, mechanism and stage was full considered. We expect to construct a new urbanization model suitable for Shandan County. By analyzing the quality of population and land urbanization, evaluating the coordination relationship and identifying the coordinated development stage, we hope that the results can provide scientific references for the strategy decision of new urbanization in other oasis cities in China.

2. Theoretical connotation of new urbanization

The goal of new urbanization is not extended development, i.e., increasing investment, expanding urban areas and improving urbanization rate. New urbanization aims to build a well-off society, improve