Frontiers in Business, Economics and Management
ISSN: 2766-824X | Vol. 9, No. 3, 2023

Ecological Oriented Urban-Rural Integration and Improvement of Living Environment in County Space-Taking Fuping as an Example

Siqi Liu[1, 2, 3, *], Biao Peng[1, 2, 3], Jianfeng Li[2, 3, 4]

[1]Shaanxi Provincial Land Engineering Construction Group Co., Ltd. Xi'an 710075, China
[2]Institute of Land Engineering and Technology, Shaanxi Provincial Land Engineering Construction Group Co., Ltd. Xi'an 710075, China
[3]Key Laboratory of Degraded and Unused Land Consolidation Engineering, the Ministry of Natural Resources. Xi'an 710075, China
[4]Shaanxi Provincial Land Consolidation Engineering Technology Research Center. Xi'an 710075, China

[*] Corresponding author

Abstract: County-level development has been the focus of China's new urbanization strategy, as well as the key to urban-rural integration and rural revitalization. As the urbanization level of major cities gradually stabilizes, China is gradually entering the stage of county-town urbanization. This article believes that the primary task of integrating county-town is to handle the urban-rural transition zone well. Firstly, this area can supplement and improve the functions of the county seat. Secondly, the environment and industries in rural areas can be extended and developed. Therefore, in the process of county urbanization, it is necessary to comprehensively consider social, environmental, and economic benefits, with the goal of improving the quality of human settlements. This study takes the Shichuan River region in Fuping County as the research object, analyzes the current situation of the region, and proposes a planning model that should be ecological oriented and comprehensively considered. At the same time, this model has been promoted and applied. More than 80% of people in the questionnaire survey expressed satisfaction with this ecological development model.

Keywords: Urban-rural integration, Ecological planning, Human-oriented, County space.

1. Introduction

In the process of urban development, due to population and economic growth, the cost or expense of the city increases. When the growth benefits of the city exceed the growth costs, the expansion of the city size is inevitable. Rural–urban fringe is the junction of cities and villages, and the main object of urban space expansion. The rational layout of its internal land use space plays an important role in curbing the urban sprawl and achieving the sustainable development of the city. However, in the process of rapid urbanization in some cities in China, urban development decision-makers often ignore the rational layout of rural–urban fringe space because of their pursuit of short-term benefits, thus increasing the possibility of urban ecological and social problems [1]. The excessive expansion of cities has made land waste, disordered landscape construction, loss of history and culture, rural population flow, loss of regional cultural identity and ecological environment deterioration widespread in rural–urban fringe. The destruction of excellent natural Cultural resource management and historical sites, the gradual disappearance of urban and rural landscapes with regional characteristics, the encroachment and encroachment of important ecological sensitive areas, and the breaking of the Balance of nature between the city and nature will bring great pressure to the harmonious and stable development of rural–urban fringe.

As part of the embryonic form of the future urban spatial structure, and the first starting position of the expansion and extension of urban spatial form, with the continuous expansion of the city size, the problems and contradictions faced by Rural–urban fringe are more complex and prominent [2]. It is necessary to comprehensively consider land resources, land use methods, ecological environment protection, recreational use and other issues. Moreover, the economic growth and social development of marginal areas will directly affect the implementation of sustainable development strategies for the city itself, which is of crucial significance for achieving the overall healthy development of urban morphology, urban-rural integration, and building a socialist harmonious society.

2. Research Areas

Fuping County is located on the northern edge of the middle section of the Weihe Basin and is a transitional zone of the Loess Plateau in northern Shaanxi. The terrain is generally high in the northwest, low in the southeast, and uneven in the middle, with an elevation of 375.8-1439m. The northern part is a part of the Qiao Mountain Range, commonly known as the "North Mountain" in Guanzhong, with a general elevation of 800-1200m. The terrain south of the North Mountain gently leans towards the southeast, with an elevation of 400-800m. Fuping County belongs to a warm temperate continental semi humid and semi-arid monsoon climate, with a large temperature difference between day and night, and distinct dry, wet, cold, and warm seasons. Due to the influence of terrain, there are significant differences in climate. According to the rainfall data from Fuping Meteorological Station from 1960 to 2008, the average annual rainfall in Fuping County is 528 mm; The distribution of precipitation is uneven within the year, with significant interannual variations. The precipitation from July to September accounts for about 50% of the annual precipitation. The average annual water surface evaporation is 1229 mm. The average temperature for many years is 13.1 ℃, with an extreme maximum temperature of 40.9 ℃ and an extreme minimum temperature of -15.7 ℃. The average frost-free

period is 226 days, with an average annual relative humidity of 65%, an average annual wind speed of 3.4 m/s, and a maximum wind speed of 20m/s. The maximum permafrost is 32 centimeters, and the maximum snow cover is 14 centimeters. The annual average Sunshine duration is 2352.3 hours, and the annual average total solar radiation is 123.9 kcal/cm^2.

3. Development Status of Fuping

In the Overall Urban Planning of Fuping County (2011-2030) released in 2016, the Urban hierarchy of "one main, two secondary and three centers" in Fuping County was defined. Fuping Central District is the main development center, connected to Zhuangli Town and Xue Town respectively, and radiating to 14 other general towns, forming a comprehensive spatial layout network. In the overall layout, the central urban area is located in the south of Fuping County, and Shichuan River is located in the south of the central urban area, close to the junction of Fuping County and Yanliang District, which is a typical rural–urban fringe.

As the central urban area of Fuping County, fully considering the natural environment and geographical characteristics, the urban spatial structure layout with "two rivers, two plateaus, and four areas" is planned. The Wenquan River is parallel to the Shichuan River, and the Xiyu Expressway intersects with the Shichuan River, forming the main four areas of the central urban area. The Wenquan River flows through the main functional areas of the city, and the main commercial and residential centers of the city are developed and constructed between the Wenquan River and the Ishikawa River. The Nanyuan area on the southeast side of the Shichuan River only has a small number of residential and small-scale commercial centers, while the southwest side is connected to the natural green space and Nanyuan (Jingshan Plateau), which is an important link between urban functions and natural environmental resources. From the road Transportation planning map of the central urban area in 2011-2030, the urban expressway connects the edge of Wenbei District and the central district on the north side of Shichuan River and forms a ring road [3-4]. There is checkerboard shaped urban trunk roads and urban secondary trunk roads planned in the two districts. The road system on the south side of Shichuan is different from other areas, mainly composed of urban main roads and secondary roads, forming a small-scale closed loop of secondary roads. This is also the characteristic of road planning formed by the design of regional location environmental characteristics and urban functional characteristics. At the same time, in the 2017 Green Line Map of Fuping County, the location of the park green line in the central urban area of Fuping County was clearly defined [5].

4. Ecological Oriented Comprehensive Development Model

As shown in Figure 1, the project area is a transitional area between a contiguous small town built-up area and a pure agricultural hinterland, influenced by both urban and rural development forces. The Rural–urban fringe is a dynamic development area, and there is no clear and fixed space boundary between all levels, as well as between the fringe and urban and rural areas. According to the stage laws of urbanization development, the accelerated development of urbanization will lead to significant changes in population structure, urban-rural spatial structure, and rural regional spatial, social, and economic structure.

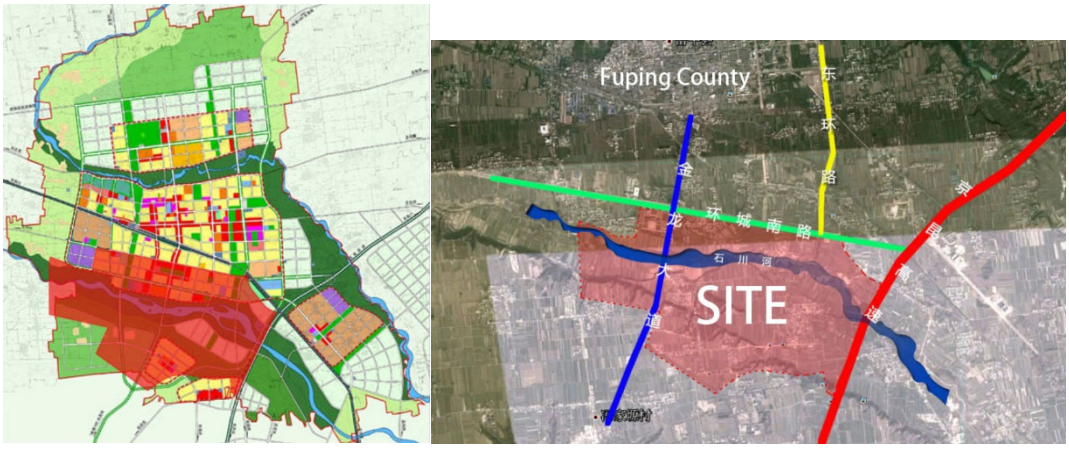


Figure 1. Project location

The functions of rural settlements in rural–urban fringe have gradually changed from agricultural production and villagers' living in the past to multiple and complex functions such as production, processing, commerce and trade, farming experience, ecological conservation, sightseeing and leisure, recuperation and vacation, and the second residence of citizens. The situation of villagers' part-time employment is obvious, and their income has increased, but there are also disorderly and decentralized development of villages, scattered overall spatial layout, poor ecological environment quality, and low land efficiency There are many problems such as a mixed population, weak infrastructure, chaotic rural landscapes, and the disappearance of traditional rural culture. Before the implementation of the project, the river basin had already experienced flow interruption, exposed riverbed, and overgrown rocks and weeds, even becoming a place for garbage stacking in the surrounding area. The river basin has not only not become a continuation of urban functions, but also a natural barrier between urban and rural landscapes. The harsh ecological environment has also been criticized by surrounding villagers, hindering the development of local economy.

The ecological oriented development model of urban fringe complex is a multi-disciplinary and interdisciplinary development model that takes land engineering as the technical support, ecology as the direction, and the goal of

improving the quality of living environment. In the early stages of planning and construction, it was clearly proposed that the project should be promotable, implementable, and exemplary. The project needs to form a comprehensive construction system, emphasizing the practicality and operability of various technologies and methods, which can provide a basis for the development of the marginal areas of small and medium-sized towns in the central and western regions. To build a regional demonstration site for low-carbon communities in the northwest region, fully reflecting the demonstration significance under resource constraints.

5. Satisfaction Survey

In the 13th Five Year Plan Outline released by Fuping County in 2016, the main tasks pointed out that we should rely on the Shichuan River ecological corridor, build high-edge communities, develop healthy elderly care, improve the living environment, attract people and logistics, and promote urban integration. Promote the second phase of the Shichuan River Wetland Park project and achieve seamless integration with the Shichuan River landscape in Yanliang. Pay attention to the planning and layout of the three major sectors of the city, river, and tableland, stipulate development boundaries, emphasize green development, and focus on building a city development pattern that integrates the two cities, shares the river and tableland, and has a pleasant environment. Moreover, the major project in the field of modern service industry during the 13th Five Year Plan period will be to complete the supporting landscape of the Ishikawa River and meet the conditions for applying for a 3A-level or above scenic spot.

From this, it can be seen that the landscape and cultural leisure functions around the Shichuan River Basin are important components of the social and cultural development of Fuping County. One of the main planning goals of this project is to strive to build the parks around the river into an important carrier for enriching residents' daily activities. In order to verify the effectiveness of this project in enriching residents' leisure activities, on September 25, 2019 (Wednesday) from 18:00 to 20:00, the "Shichuan River Ecological Park Use Status Survey Questionnaire" was implemented within the scope of the park for visitors, and information was collected and analyzed on the current use status of the park. During this period, the total number of people staying in the park at the same time was about 370, and the number of survey respondents was 208, accounting for about 56% of the total number.

The vast majority of visitors believe that the park has reached a satisfactory level (82%). It can be seen that as the initial stage of use, the second phase of the project and the Shichuan River Ecological Park on the opposite bank of the commercial street have not yet been fully put into use. Despite the continuous improvement and renovation of the space, they have still received high praise from park users and have well assumed the function of urban leisure and entertainment space. Through the investigation and analysis of the current usage status of the Shichuan River Ecological Park, it can be seen that this park has played a supplementary role in the urban leisure and entertainment space on a large scale, providing a comfortable space that can be frequently used for citizens' daily leisure and entertainment activities. As a rural–urban fringe, Shichuan River Ecological Park has fully considered the design concept and method for expanding the range of attraction and radiation. By increasing the complexity of the park's functions and planning the use of transportation modes for long-distance visitors, it has attracted a large number of residents from the initial stage of construction. Now it has formed a stable number of use and mode, and has obtained the satisfaction of most visitors. In addition, through the renovation of the Shichuan River Basin and the construction of ecological parks, the impact on the daily living habits of residents on a large scale has been formed, playing an important role in improving the quality of residents' living activities and their health [6]. It has responded well to the development goal of people's happiness and health in Fuping County's 13th Five Year Plan by building a complete public cultural service system.

Acknowledgment

This work is supported by Innovation Capability Support Program of Shaanxi (No. 2023-CX-RKX-102) and key projects for ecological space governance in Shaanxi (No.2022HZ1773).

References

[1] Yao Yuchun, Xia Yu. The inherent mechanism and path of county urbanization promoting Chinese modernization [J]. Issue in Agricultural Economy. 2023.

[2] Wu Jian, Wang Feifei, Hu Lei. Spatial governance: How environmental planning integrated with national spatial planning system [J]. Environmental Protection. 2021, 49 (09): 35-39.

[3] Fuping County Planning Bureau, Fuping County Urban Master Plan (2011-2030) Results Exhibition. June 16, 2016, Index number: 001-2/2017-02486.

[4] Fuping County Planning Bureau, Fuping County City Green Line Map Announcement. May 10th, 2017, Index number: 001-2/2017-02660.

[5] Fuping County Economic Development Bureau, Outline of the 13th Five Year Plan for National Economic and Social Development of Fuping County. 2016.03.16, Index number: 001-2/2017-02487.

[6] Bin Jinyou, Tang Xiaobin, Chen Shiyin. Spatial distribution and influencing factors of rural human settlement quality in Guangdong province [J]. Ecological Economy. 2021, 37(12), 203-209+223.