

The Planning Strategy of the “New Town” around the Metropolitan Area from the Perspective of Urban-Rural Relationship Change — A Case Study in Wuhan

Geng Hong and Pang Kelong

Abstract—With the transformation of township production mode, small towns have the economic function to integrate the resources of town-rural effectively. With the gradual emergence of the regional sharing of service facilities, the small towns around the metropolitan area have assumed the service function of realizing the urbanization of farmers. Under the trend of the change of township functions in small towns around the capital city, some central towns have been transformed into new towns and become an important space carrier for urban and rural integration. This paper takes Wangji street planning practice as an example to explore the planning strategy of the new town under the background of the function of the town in the surrounding towns. Break the administrative unit of the thinking mode of "town", establish a new mechanism of coordinated development, bridging with break phenomenon in the daily life and development of construction, combined with their own resources endowment of path planning is put forward, to provide the reference for the research of new town planning method.

Index Terms—New town, small town, county-rural relationship, planning strategy.

I. INTRODUCTION

Since the reform and opening-up, towns and rural relation in China has undergone a great change. The relatively stable and independent relationship between traditional towns and villages has been broken. Due to the strong impact of external environment, towns and villages turn to be close from being independent, and then to be separated again in the development process. There's a sharp contrast between rapid expansion of metropolis and collapse of towns and villages. Coordinated rural-urban development becomes the top priority of current urban and rural construction. Due to the influence of metropolitan area and development gap among different districts, villages and towns development becomes closer to regional development. The driving force of small towns appears to be in differential status. Investment pulling and economical shielding coexist. Towns in the metropolitan area are closely related to the development of large cities. Regional economic disparity strengthens the differentiation of towns and villages. Regional economic development transforms from “rural areas leading” to “urban areas leading”. Central towns and key towns around metropolitan areas gradually develop from “rural type” to “urban type”. As

the representative of small towns, new towns become spatial entities of unique connotation. It can relieve urban population pressure, optimize city structure, speed up urbanization process and guide the rational and orderly development of space etc. in metropolitan areas. Therefore, in the context of gradual deconstruction of traditional towns and villages relation in metropolitan areas, the construction of new towns will become a vital path to promote coordinating urban-rural development.

II. NEW FUNCTIONS OF NEW TOWNS SURROUNDING METROPOLITAN AREAS: TAKING LARGE CITIES DOCKING AS MAIN GUIDANCE

A. Regional Function: To Guide Towns and Villages to Dock Cities

1) Weakened towns and villages relationship, resource skip level flow, differentiated small towns driving forces

With the gradual improvement of the primary ration of cities, development of towns and villages surrounding metropolis are affected by the powerful radiation of metropolis [1]. The relation between towns and villages gradually transforms from a traditional mode of hierarchy progress and mutual attachment to be more complicated and plural. There becomes a vague hierarchical relation between towns and villages. Resources between towns and villages break the traditional step-by-step flow mode of “village-town-city” respectively from 3 aspects including population, production and marketing way, and daily life style to achieve cross level flow. Attracted by metropolitan job opportunities and public service, residents in rural areas maintain the urban and rural dual business model by labor division between generations or couples and labor migration. But with the development of information and popularity of e-commerce, the selling of rural agricultural products skips the distribution of multilevel contracting, and realizes point-to-point direct sales. Most rural residents move directly to surrounding cities across villages and towns in public service [2]. Take Wuhan as an example. It's found in the survey on Fasi Town, Jiangxia District, Wuhan that currently besides kids going to primary schools in the town due to policy limitation, residents prefer to hospitals in Jiangxia District and Wuhan Central urban area as the first choice for medical facilities use. Then there appears regional sharing status of public service facilities.

2) New towns docking surrounding cities and carrying on regional resource transfer

Under the influence of metropolis, small towns

Manuscript received November 9, 2018; revised May 1, 2019.

Geng Hong and Pang Kelong is with the Huazhong University of Science and Technology, Wuhan, China (e-mail: genghong999@163.com, 981323053@qq.com).

surrounding metropolis are gradually differentiated to “village type” and “town type”. “Town type” small towns mean that some small towns feature with some attributes of cities in economy, social culture and infrastructure etc. They become the important spatial carrier of urban-rural integration new town [3]. This kind of small towns shall take leading the docking cities of towns and villages as the main function and act as the regional “micro center”. By rational positioning and labor division of towns and villages by integrated metropolitan planning, to realize the precise docking of functions of small towns and big cities. Based on market economy and policy adjustment, small towns conduct rational resource allocation in regional level, to make small towns and villages quickly integrate into metropolitan development, to enjoy the development benefit of urbanization together.

B. Economic Function: Effectively Integrate Towns and Villages Resources

1) Villages-towns mode of production conversion under diversified agricultural management mode and urban-rural dualism by-business of villagers

With the unceasing advancement of economic development and industry transformation, the economic function of villages surrounding metropolis has undergone a huge transition due to the influence of metropolis diffusion. Firstly, guided by policies such as land circulation and agricultural scale production etc., land resources in the countryside have been integrated again. The degree of agricultural mechanization and scale production have been gradually intensified. Labor force in the countryside has been further released. And some production organization methods including family farms, rural cooperatives, and agricultural organizations etc. mark the conversion from traditional agriculture to modern agriculture. Secondly, relying on agricultural resources, rural tourism taking residents of the central urban area of surrounding metropolis unceasingly springs up in rural areas, which marks that rural agricultural development surrounding metropolis is now converting from “production type” with the agricultural product as the dominant to “consumption type” integrating tourism and sightseeing. And rural residents’ income tends to be diversified. The production and life radius gradually expand with the diversified production organization mode. Lastly, due to the constant improvement of diversified agricultural management mode and scale degree of agricultural mechanization, the rural labor force has been further released. Infrastructure construction in the rural area tend to be perfect gradually, and the further popularization of public and private transport enlarges the commuting scope of “20 minutes daily life cycle” of rural residents. It’s more convenient for surplus labor surrounding metropolis to convert to cities, and urban-rural dualism by-business becomes more common in rural families.

2) To carry on urban industry spillover externally and integrate rural resources internally, and form an integrated development patten of “industry, town and village”

As an important spatial carrier of city and countryside integration surrounding metropolis, new towns shall actively carry on urban industry spillover externally, fully make use

of the new opportunities brought by industry division and function reconstitution in each district surrounding the metropolis, achieve the specialization of economic function and effective integration of means of production, and lay a solid industry foundation and expand industry chain. By carrying on industry spillover in big cities as planned, it can effectively create job opportunities to surplus rural labor force, and lay a foundation to realize farmers’ intra-regional urbanization [4]. And meanwhile to integrate rural resources, realize multi-variant integration of standardized production, characteristic management and experience-based tourism, and improve value added of the agricultural industry. In industrial transformation and development period, we shall comply with the new change of rural industrial organization mode, form the town and village organization mode with production and life as double orientation, cities and towns’ spatial structure with industrial cluster and agricultural cluster coexisting, and “industry towns and villages” integrated development mode with cluster developed spatial form of towns and villages as the manifestation form, and improve the income residents in towns and villages.

C. Service Function: To Achieve Intra-regional Urbanization of Farmers

1) Obvious shared characteristics of service facility area, and weakening attraction to rural residents of some towns

In 2016, there’s a survey on small towns in Hubei province. The result shows that the use ratio of layering configuration of infrastructure in small towns is relatively high. And the public service infrastructure configuration is improved and become perfect, which can meet residents’ daily leisure and entertainment requirement. Residents in towns have a relatively high use ratio of social service infrastructure in counties and surrounding cities. Most small towns have obviously improved their capability and standard to “top-down” deliver service in public service function, and gradually strengthen the relevance with surrounding cities. Looking from the overall status of its development and use, on one hand, because of the gradual perfection of social service infrastructure and broadening of “20 minutes” life circle scope of towns and villages residents, the regional sharing characteristics of service infrastructure becomes obvious [5]. On the other hand, due to the continuous promotion of Beautiful Countryside Construction, public policies gradually shift to rural areas. And the hardware environment in rural community has been remarkably improved. And considering the improved convenience of transportation and logistics, attraction of part of public functions of some towns are weakened to the rural residents in the town [6].

2) To improve pertinence and utilization efficiency of public service facility, and provide pluralistic service to realize farmers’ intra-regional urbanization

As the key area for metropolitan further urbanization, the optimization of small towns’ service function can facilitate docking the relationship between towns, villages and metropolis in advance, prevent from that farmers failing to settle down in cities and no job offered after going back to hometown, and realizing the intra-regional citizenization of farmers. Thus suburb small towns shall comply with the trend of small towns networking and differentiating development,

improve the pertinence and utilization efficiency of public service facilities, and screen and strengthen “public service center type” small towns’ function to meet the requirement to perfect public service type and improve standards in small regions.

III. NEW TOWN PLANNING PRACTICE WITHIN METROPOLIS COVERAGE AREA UNDER VILLAGES AND TOWNS FUNCTION CHANGE — TAKE WANGJI STREET AS AN EXAMPLE

A. Current Status of Towns

Wangji Street is located in Xinzhou district, Wuhan, facing Zhucheng on the east, and adjacent to Daoshui River and Yangluo economic development zone in the west, and Zhangdu Lake and Shuangliu to the south. It becomes a key node to contact Zhucheng and Yangluo with Hanshi Road. It’s 42km away from central areas of Wuhan, 12 km from Yangluo Harbor port and 10km from Zhucheng. In the end of 2015, it was registered with 87,000 permanent resident population, covering an area of 142.1km². It includes 1 community, 50 administrative villages, and 245 natural villages. It has a superb traffic location. Being in the outskirt of Wuhan metropolis development zone, it can reach central area of Wuhan within 1 hour by Wuying highway, and reach Yangluo airport and Yangluo Harbor within half an hour by Hanshi road. According to Wuhan rail transit planning, subway line 21 sets a stop in Wangji Street to connect Wangji quickly into Wuhan subway network.

B. Development Status and Existing Problems of Wangji Street Towns and Villages

1) A populous town in Xinzhou district, with population density in midstream

In 2015 the total population in Wangji street reached 87,000, ranking the 3rd among 15 street towns in Xinzhou district, just next to Zhucheng Street where Xinzhou Government locates (161,000 people) and industry new town Yangluo Street (91,000 people). The population distribution density of the town is about 501 to 1,000 people/ m², which is in the midstream level of Wuhan population density.

There’s a slow population growth, but widespread migrate workers. In the recent 5 years, the population in Wangji Street just newly increases 1,184, with an unsteady growth rate. The annual increase rate is just 3.4%, mainly for natural increase. Since 2011, the population in Wangji keeps flowing outside and it is in a rising trend year by year. In 2015, there was a total of 29,673 who went out as migrant workers, covering 34% of the total population of the town, and 45% of total labor force. According to the statistics, a large amount of Wangji rural labor force flow outside, and the percentage between agricultural production labor and outflow population is about 2:1, which is not good for agriculture development.

Household registration is with low urbanization level, and it’s in high non-agriculturalization degree. The urbanization rate is just 155, far lower than the whole country, Hubei province and Wuhan average. In 2015, 30.7% of the population in Wangji Street was engaged in non-agricultural industry, and the percentage rises year by year with an annual increase of 1.8%.

2) Strong momentum that industrialization leading urbanization, low industrial level and steady agriculture, strong industry and weak tertiary industry

Wangji Street is now in the development phase of industrialization leading urbanization, and with a relatively strong development momentum. The proportion of tertiary industry was changed from 19:38:43 in 2011 to 13:60:27 in 2015, and in the transition phase from the beginning to medium term of industrialization.

The overall industrial structure level is relatively low. There’s lack of interaction among the 3 industries, and coordinated development is insufficient. In recent 3 years, GDP per capita in the town tends to be zero increase. Wangji Street overall appears to be in “231” industry structure, in low industry level, and lack of coordination and mutual facilitation. The introduced industry exerts a low efficiency in improving employment and resident income. From 2013 to now, there’s not a big change in street GDP per capita. Industry development lacks of new growth points.

3) Slow space expansion, village distribution close in north and sparse in south, high target in fragmentation collection land

The construction land of the whole street is enough in total volume but scattered in distribution. The total construction land covers 1255.3 ha, 9.4% of the total land area. The construction land area per capita is 144.3m². Construction land distributes sporadically along the town and 425 natural villages.

Construction land in the town is in a small scale, covering 14.6% of overall construction land, with 140.5 m² per capita. The construction land distributes along Hanshi Road, and appears to be in “industrial park in west, residential area in east” development mode along the road. In recent 5 years, space expansion is not obvious, and industrial estate increase becomes the main space expansion of the town along Hanshi Road.

Wangji Street governs 51 administrative villages, which are close in north, sparse in south, large in south and small in north, and gathering in 3 groups. Affected by the topographic feature of being draughty in north and flooding in south, villages in the north gather with Kongfu as the center; Those in the middle develop in groups along Hanshi Road; And those in the southeast conduct linear tandem development along Liuda Road. The village construction land covers 71.4% of the total construction land, and the construction land per capita is 120.8m². Integrated standard configuration is basically complete. The contact between towns and villages are convenient, and residents’ intra-regional urbanization appears in a distinct phenomenon.

C. Planning Strategy

1) Regional level: to undertake Wuhan new port industry transfer, serve the future new town, and realize regional synergy

Take regional industry development axis and regional ecological recreation axis as the linkage skeleton, and realize the major regional and comprehensive integrated development of Wangji. Give full play to Wangji’s position advantage of Yangluo to the southeast and Zhucheng to the northeast, and its own sound ecological dominance. By

further strengthening the docking of transportation network and construction of Wuhan new towns and rural complex, it provides life service featured by ecology, livability and leisure to Zhucheng in the east, and gradually forms the Zhucheng-Wangji integrated development pattern. And it bears industry transfer to Yangluo in the west, grows port-surrounding service industry, and takes healthy leisure and modern food industry as the breakthrough to create a leisure service base for Yangluo (Fig. 1).

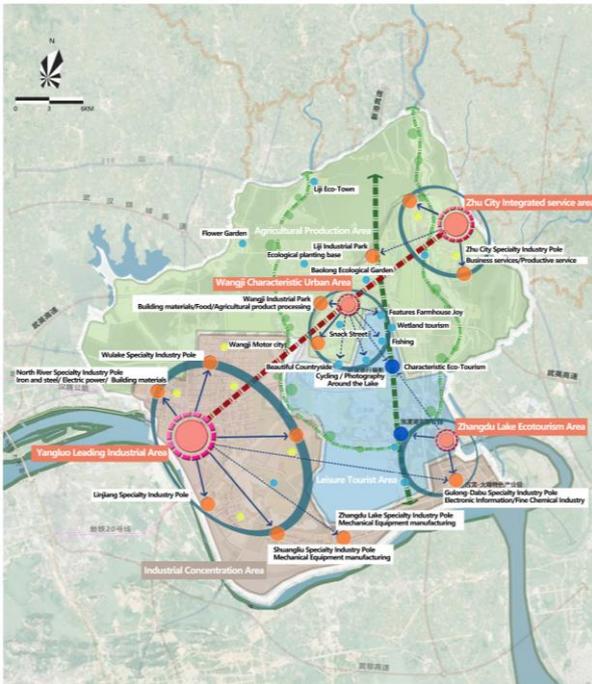


Fig. 1. Zhucheng—Wangji—Yangluo industrial integration coordination drawing.

Source of the Map: self-drawing by research group

2) *Industry level: Cluster development to form a new growth pole*

Stick to the thought of cluster development, promote the interactive development of industrialization, urbanization and agricultural modernization, and form a new growth pole. Enable Wangji to integrate into regional industry pattern by industry system adjustment and spatial system optimization.

Industry system adjustment: To fully integrate existing industrial base and featured resource of Wangji. Leading by “6th industry” as the main direction for industrial chain group development, to form an agricultural and specialty industry brand integrating with agricultural demonstration planning, agro-product processing and agricultural service. And meanwhile to consider the regional demand of port surrounding plate, expand the industrial chain, optimize and improve industry category, and gradually form an integrated industry system with distinct characteristics, significant correlation and regional integration synergy.

Spatial system adjustment: rely on industry association request, optimize the matching space of leading industry and supporting industries, and from a new industrial space pattern with stair linkage of leading industry function area, supporting industrial park and specialty industrial point. And construct a new pattern of whole regional development with Yangluo new town as the lead, towns as the supplement, rural communities as the specialty, and parks as the basic unit.

3) *Spatial layers: organic dispersion, major agglomeration, and spatial coordinated development*

Stick to the thought of cluster development, promote the interactive development of industrialization, urbanization and agricultural modernization, and form a new growth pole. Enable Wangji to integrate into regional industry pattern by industry system adjustment and spatial system optimization .

Industry system adjustment: To fully integrate existing industrial base and featured resource of Wangji. Leading by “6th industry” as the main direction for industrial chain group development, to form an agricultural and specialty industry brand integrating with agricultural demonstration planning, agro-product processing and agricultural service. And meanwhile to consider the regional demand of port surrounding plate, expand the industrial chain, optimize and improve industry category, and gradually form an integrated industry system with distinct characteristics, significant correlation and regional integration synergy (Fig. 2).



Fig. 2. The spatial structure plan of Wangji.

Source of the Map: self-drawing by research group

Spatial system adjustment: rely on industry association request, optimize the matching space of leading industry and supporting industries, and from a new industrial space pattern with stair linkage of leading industry function area, supporting industrial park and specialty industrial point. And construct a new pattern of whole regional development with Yangluo new town as the lead, towns as the supplement, rural communities as the specialty, and parks as the basic unit.

4) *Towns and villages system level: To construct an integrated organization mode of “industry towns and villages” with “one town one specialty, one village one product”*

Considering the phenomena of scattered distribution of villages, convenient contact between towns and villages, complete flat facilities, small scale village industry, high rural ecological environmental pressure and rural residents going out as migrant workers etc., we shall plan from the whole picture to construct a village and town architecture with 1 new town, 9 central community and several special villages, to achieve the functional division integration of new

towns, industrial parks, rural communities and special villages. In town and village function planning, it caters to the actual situation of rural residents “work without leaving home”, implements new town’s development requirement, emphasizes on green architecture, modern food industry and modern service industry. The 9 central communities undertake the function of rural population aggregation, develops facility industry, elderly care service, tourism service, business casual and agricultural sci-tech service. The featured villages bear functions of leisure agriculture and tourism service etc.

IV. ENLIGHTENMENT OF PLANNING PRACTICE

A. Adapt to the Development Trend, and Transform Development Philosophy

Small towns surrounding metropolis are now becoming the new pace of counter urbanization. To go to villages and small towns has become a preference of the second dwelling for the middle class on weekends and holidays. With the improvement of traffic condition and internet popularity, the spatial distance of small towns to be away from economic center is not a barrier to work and life anymore. Green, low-carbon and ecological small towns close to nature have become the scarcest resources in metropolis. The planning strategy of “organic scattering and major agglomeration” gives a full display to its ecological resource advantage. Make use of the convenient transport location conditions to undertake Yangluo industry transfer. Make its own ecological resources to serve the new Zhucheng. Make use of the development achievement of information technology, go beyond the phase of traditional industry development, directly develop online shopping agriculture, culture creativity, tourism, elderly care and health care, traditional handicraft industry with modern design and rural hotels, form a new green industry, new 3 industries integration business type, and light asset development model, and become a new node in the region to undertake main city serving the new town.

B. Precise Space Layout, Breaking through the Thinking of “Town” in Administrative Region Unit

To break through the thinking of “town” in administrative region unit, cross-border integrate “area” in different industrial parks and scenic spots to form open and sharing life, production and ecological space. To establish a brand new synergic development mechanism, construct a new ecological community, and embody small and special, small and green multi-element integration to maintain prosperity and vitality of the small town.

C. To Construct Concentric Public Service Auxiliary System, and Bridge the Break Joint Phenomena in Construction Development and Daily Use

Comply with the trend of small town networking and diversified development, improve the pertinence and utilization efficiency of public service facilities, strengthen the “public service center type” function of New town of Wangji Street, and fulfill the demand of improving small regional public service type and improving standard. Considering the small town function differentiation and new

pattern of urban industry development, population development and change in industry labor force group constitution, and request to meet the development needs of special towns, we shall scientifically and reasonably conduct networking responsibility division and capability allocation. According to the principle of justice and equity, service first, discrepancy matching and efficiency guarantee, to conduct unbalanced optimized development for public service network system shared in the region, and lay an effective foundation for social service sharing and special service sharing development in new urbanization and even post-urbanization era in vast rural areas. To maintain the ontology vitality of small towns, and gradually enhance and maintain the “entity connotation” of public service center effectiveness of small towns in the region.

In a highly differentiated context, due to different development phase, conditions and foundation of different regions and different small towns, there’s a big gap in understanding, pursuing development evolution of various towns and villages, conducting goals setting and mode construction etc. Adjusting measures to local conditions is the soul of small towns planning. Each small town shall be unique by combining their own resources and conditions to develop. The more adjusting measures to local conditions, the more possible to be distinctive. Then towns and villages planning and industry development shall be more customized.

REFERENCES

- [1] R. Q. Li, “Thinking on the relationship between towns and villages in the Yangtze river delta,” in *Proc. 2016 Annual Meeting of China Urban Planning Planning for 60 Years: Achievements and Challenges*, 2016.
- [2] Z. D. Luo, X. Lu, and G. Lei, “Study on the characteristics and micro-mechanisms of rural residents’ migration decision from the perspective of family: Based on the field survey in Wuhan,” *City Planning Review*, 2016, vol. 40, no. 7, pp. 38-47+56.
- [3] X. Nning, “The growth mechanism in the small towns in rural Regional economy movement of — In Jiangsu as an example,” *Economic Geography*, 1997.
- [4] C. Biding, “New town: An integrated space carrier for urban and rural development,” *Urban Development Studies*.
- [5] L. Yong, G. Q. Liu, and S. N. Chen, “The planning strategy of the mountain ecological town in the suburb of the metropolis — Taking the general plan of the Wandezhen town in Jinan City as an example,” in *Proc. the 9th Annual Conference on Urban Development and Planning*, 2015.
- [6] Z. Juan, A. S. Liu, and X. X. Hua, “The construction of a suburban new town based on ecological concept — Taking Xuyan town, Changzhou city, Jiangsu province as an example,” *Small Town Construction*, 2008.



Geng Hong was born in 1961. She received her doctor of urban planning and was graduated from Wuhan University of Technology, Wuhan, China. Her main research are directions are theory and design of urban and rural planning/ regional development/ the construction of small towns.

She is a professor and the Ph.D. supervisor in School of Architecture and Urban Planning, Huazhong University of Science and Technology, Wuhan, China.



Pang Kelong is a PhD student of Urban Planning in School of Architecture and Urban Planning, Huazhong University of Science and Technology, Wuhan, China.