

Emerging Development and Cooperation in Land Use Planning along the Yellow River under New Regionalism: A Case Study by Jinan City, Shandong Province, China

1 INTRODUCTION

Bearing some resemblance to North America in the early 1990s, China is currently issuing various regional developments and spatial planning strategies, aiming to coordinate development of various cities in regional context. In the final period of 11th Five Year Plan, almost 30 planning documents have been released in 2009 and 2010, which involved not only the traditional urban regions such as Lower Yangtze River Delta and Pearl River Delta, but also some less developed provinces in Middle and Western China (Jin, 2011). Among these initiatives, plans can be categorized into two kinds: one is of policy zone (Zhengce Qu) and the other is of comprehensive reform experimental zone (Zonghe Gaige Shiyan Qu) (Figure 1). Meanwhile, a series of territorial plans has also been drafted such as national urban system planning, national main function plan, etc.

The dynamic initiatives mentioned above demonstrated the great ambition from different departments of central state to inspire and ordinate newly developing local-level region. This trend has been accelerated by establishment of intra- and inter-regional mass transit infrastructure. High Speed Railway (HSR) between Beijing and Shanghai is the most significant case. It is expected such transit infrastructure will serve for compressing time-space among the cities and will in favor of tourism, tertiary industry and communication for future development.

Therefore, cities in China are progressing into a new era of region-based development and the mutual relationship has become more intensive. Hence the new regionalism is becoming significant when planning involves coordination and collaboration issues. More specifically, in the regional level, network has become the new pattern of urbanization approach and the evolvement of urban system is presenting new features. While in the local level, local authority is pursuing for scale expansion and evoking new challenge for collaboration in land use integration, as well as potential competition in land resources utilization.

2 NEW REGIONALISM IN CONTEMPORARY CHINA

Generally, cities and towns in contemporary China are thriving out in terms of urban

population, construction area as well as economic growth. However, with the awareness of regional integration process, planning methodology has drawn on the regional context as key element in determining urban visions. Urban units in the region interact with each other significantly and emerge reciprocal relationships in the form of cooperation, as well as hostile attitude in the form of competition. Meanwhile the fragmentation in physical land use as well as decentralization in government structure evokes planning approach more dynamic and all-inclusive, which is relatively correspondent to the new regionalism that focuses on specific territories and spatial planning, takes a more holistic planning approach and emphasizes physical planning(M.Wheeler, 2002).

From this viewpoint, urban units in regional context have to follow policies from the upper level governments, deal with relations with the same level authorities, maintaining governance for the lower level urban settlements. Urban system including prefecture-level cities, districts, counties, towns and villages is a net work complexity, where the individual units are searching for their own inspirations. This situation poses highly necessity for regional ordination, however lacking similar administrator like Regional Development Agency in western world, practical regional cooperation in contemporary China only happens spontaneously between adjacent cities, functioning mainly on land use and territories issues. The planning approach in urban system ostensibly focuses on ecosystem or social equity as advocated in new regionalism, however economic growth is still beyond the other objectives when engaging in real land development.

Taking Shandong as an example, the situation will be illustrated more clearly in an empirical manner. Served as the Capital of Shandong Province as well as the growth pole in the region, Jinan is experiencing fast urban expansion in order to take advantage of this developmental trend. Urban and regional plans of different hierarchies tend to cater for construction land expansion and define the growth pattern in scale. From the regional scale, prefecture-level cities around Jinan are considered into Jinan Metropolitan Area Plan in order to pursue for the integrity of the region, while cities and towns in the region demonstrate different developing approach of scale distribution especially in terms of construction land. From the local level, Jinan is also conducting transformation in spatial and economic structure and organizing urbanization process in suburbs. Since the Yellow River serves as part of the city's boundary, land resources along the area are attracted close attention and imposed potential interest in planning and constructing new function. Emerging development along the boundary lands conveys collaboration among different stakeholders. Therefore, how to evaluate the formation of this collaboration and whether the development process achieves the goal in terms of ecology, environment and livability in a larger scale, needs to be analyzed carefully.

3 REGIONAL SCALE FEATURES IN JINAN METROPOLITAN AREA

3.1 Regional Pattern in Shandong Province

Comparatively, Shandong Peninsular City Agglomeration is inferior to Beijing-Tianjin-Hebei Urban Region, Pearl River Delta City Region and the Lower Yangtze Delta Region, ranking the fourth in scale in China. Meanwhile, Shandong Peninsular is the main part of economic development area in the province, within which, the two super-large cities, Jinan and Qingdao serve as the two priority poles in regional pattern. Actually, just like Jinan's leading role in Jinan Metropolitan Ring, Qingdao is the prime city in Shandong Peninsular Blue Economic Zone which locates in the east of Shandong Province and the coastal area, embodying the feature to develop economy based on oceanic industry, where is also the advanced core economic region of the whole province(Figure 2). Relatively, Jinan Metropolitan Ring locates in the central and relatively less developed in economic performance (Table 1).

Besides Jinan City, Jinan Metropolitan Ring comprises six other prefecture-level cities those are Binzhou, Dezhou, Liaocheng, Zibo, Tai'an, Laiwu, and the whole region functions as an impetus in central part of Shandong Province. Immersed in the regional context, cities and towns not only receive radiation affects from eastern developed area, but also thrive out based on the resources and advantages of themselves. Jinan is still intending to strengthen the leading role as the provincial Capital that can dominate the other cities or towns' development, while the others are still finding their way in attracting stimulant in favor of local economic growth. Therefore, guided by master plan or project initiatives, each local authority is trying its best to expand the construction land in order to carry on various urban activities. The expansion process is the result of complicate mechanism from central state, local government and global authority. While the expression in terms of construction land in the urban system implies the general pattern in land use transformation conducted by local authority in different political hierarchies, as well as the interaction and collaboration among themselves.

Table 1 Comparison of Economic Development between Shandong Peninsular Blue Economic Zone and Jinan Metropolitan Ring in 2009

Region	GDP(100 million Yuan)	GDP per Capita(Yuan)	Industrial Structure	General Local Financial Revenue(100 million Yua)	Dependence on Foreign Trade (%)
Shandong Peninsular Blue Economic Zone	16169.6	55895	7.2:57.5:35.3	962.7	47.4
Proportion in province	47.7%	-	-	43.8	-
Jinan Metropolitan Ring	12181.6	37251	8.2:54.0:37.8	653.9	11.5
Proportion in province	35.9%	-	-	29.7	-

Source : Shandong Provincial Housing and Urban-Rural Development Department. Urbanization Development Report of Shandong Province in 2010. Jinan: The Yellow River Press; 2010.

3.2 Methodology

In urban geography, Rank-Size Law is often used to describe the scale distribution and the evolvement process in urban system. Empirically, cities and towns in a country or region are ranked by size in decreasing order, with the largest city ranks 1st, and the smallest rank equals to the total number. It is suggested that German geographer Auerbach firstly applied Rank-Size Law in investigation of European and American Cities, and found the size distribution follows a Pareto distribution

$$P_i = P_1 * R_i^{-q} \quad (1)$$

Where P_i is a particular city population size ranks i , and P_1 is the population size of the top priority city, R_i refers to the rank of a particular city, q is the Pareto exponent. Then by using OLS estimate method, the equation can be generalized and the corresponding exponent can determine divergence or convergence pattern in scale distribution.

In most empirical studies, Rank-Size Law is applied comprehensively in Chinese urban system, most of which are based on population scale, with a long time span, a broad samples including large, medium and small cities all over the country (Anderson and Ge, 2005, Xu and Zhu, 2009). Besides, scholars have also extended their attention in using GDP or construction land to examine scale distribution transformation in the nation or in particular province, where the results are also corresponding to Rank-Size Law, therefore the evolvement process has been illustrated and obtained (Minghong and Changhe, 2003, Li et al., 2011, Jin, 2011).

However, due to the limitation of statistics data, the past researches are mainly focused on prefecture-level cities, lacking detailed investigation in county-level observation, where economic development is playing a more important role in contemporary China's urbanization. Especially towns in county recently have attracted more attention from developers and government officials, since towns themselves have great intention to boost up growth from bottom up. Moreover, land-based urbanization is dominated and conducted by local government significantly, so construction land expansion is a primary demonstration in spatial development influenced by political factor. Using construction land amount to analyze scale distribution specific to county-level will enable us the possibility to understand land use development and features from regional scale.

3.3 Analysis Results

Based on the obtaining data of construction land in district and county level, this paper will firstly focus on Jinan Metropolitan Ring, compared with Shandong Peninsular Blue Economic Zone, to test scale distribution and transformation in urban system. In order to

maintain the consistence of statistical data, this paper will introduce data of 2005 and 2009 from “Urbanization Development Report of Shandong Province” to implement the study, since county level data available in 2005 is the earliest while that in 2009 is the latest.

Figure 3 shows the general pattern of size-ranking for both regions in construction land. JMR and SPBEZ are essentially following the Size-Rank Law and demonstrating comparatively high adjusted R^2 , which suggests that the estimation equation explains very well, especially for JMR. Meanwhile, since the scatter-line of both region in 2005 and 2009 parallel with each other and move forward, JMR is lagging behind by SPBEZ in the amount of construction land because the line of JMR in 2009 is relatively similar to that of SPBEZ in 2005, which infers the discrepancy between the coastal and advanced region in eastern and the inland region is about 5 years’ development.

Regarding the estimation results, both fractal dimensions are larger than 1 and demonstrating an increasing tendency (Table 2). The fractal dimension of SPBEZ grows from 1.01 in 2005 to 1.06 in 2009, while that of JMR grows from 1.03 to 1.15. This change indicates both regions have experienced transformation in construction land expansion towards balanced and divergent status, where the extent of shift in JMR is greater than that of SPBEZ, hence the construction land distribution in territory is comparatively polarized in eastern area and equilibrrious in central part. Generally the disparity in construction land scale is gradually diminishing within these years even though all the cities and counties are thriving out to expand urban land and enhance infrastructure establishment.

Table 3 shows annual average growth rates of construction land expansion in different political hierarchies of both regions. Generally, counties indicate the highest growth rates in each region, since counties in SPBEZ has 10.83% growth rate and those in JMR has 16.43%. Counties in both regions increase much faster than county-level cities and city area, and it seems the lower the political hierarchy exits, the faster in construction land expansion it experiences. Also, counties in JMR demonstrate the highest expansion speed and are superior to those in SPBEZ. While the speed of city area and county-level cities in JMR can not parallel to that in SPBEZ in each level, indicating in eastern area the growth pattern is more diverse and the historical polarized situation has been maintained, to its opposite, fast development in counties in JMR potentially transform the regional pattern towards more balanced and divergent status, which just support the observation mentioned above.

Table 2 Correlation Results of Urban Construction Area

		Urban Construction Area		
		Q Value	Adjusted R ²	Fractal Dimension
Shandong Peninsular Blue Economic Zone	2005	0.87	0.88	1.01
	2009	0.84	0.89	1.06
Jinan Metropolitan Ring	2005	0.95	0.98	1.03
	2009	0.86	0.99	1.15

Table 3 Annual Growth Rate of Urban Construction Area in SPBEZ and JMR

		Annual Growth Rate of Urban Construction Area
Shandong Peninsular Blue Economic Zone	City Area	9.74%
	County-level Cities	8.37%
	Counties	10.83%
Jinan Metropolitan Ring	City Area	5.81%
	County-level Cities	7.64%
	Counties	16.43%

4 LOCAL SCALE FEATURES IN JINAN CITY & QIHE COUNTY'S INTEGRATION

4.1 *Western-Oriented Development in Jinan City*

Served as the Capital and economic center of Shandong Province, Jinan City can be traced back more than 2,000 years ago when the city was established. It maintained a closed city until opening up in 1905 with the completion of Jiao-Ji Railway construction. Nestled between the mountain to its south and the Yellow River to its north, Jinan has evolved into a typical ribbon urban form and extended to east and west significantly (Figure 4). It embraces about 336.4 km² construction land and 3.5 billion people in 2009.

According to the latest city master plan, Jinan will formulate such spatial structure as "One Core, Two Wings" with multi-centers and opening pattern. The old urban area will be preserved to become the sole urban center, while the eastern and western urban areas will be incubated into district centers. Correspondingly, the eastern area development focuses on high-tech industry, high value-added manufacturing and processing industry, as well as supplements living environment and urban service. Furthermore, since Jinan has undertaken the 11th National Games, the Olympics Center is located in east edge area of the city, including several stadiums. Meanwhile the commander and news center of National Games turned to be a governmental complexity after the Games was over, where most of the municipal authorities moved their offices there and the total building is said to be about 400 thousand m² in construction area. Facilitated by road extension and infrastructure construction, eastern urban area has been deeply developed.

On the other hand, proposed as the other development direction in the comprehensive plan, western area has not experienced fully consideration or paid much attention by both the government and developers, until the High Speed Railway Station (HSRS) is decided to locate in western area. Taking advantage of the advent of Beijing-Shanghai HSR, Jinan is serving as an intermediate station and regarding the chance as an opportunity to develop west-ward in order to stretch out. Initiated by the construction of the HSRS, a series of mega-projects were proposed near around 6 KM² land and the local government held the

ambition to establish transportation hub, culture and exhibition as well as commercial center within the hinterland. Besides, such public facilities as library, gallery and art museum were successively built to prompt local land development. In a more macro-scale, Jinan is trying to build a 55 Km² district that includes the 6 KM² as the main form of western urban area. Such projects are mainly located in Changqing and Huaiyin District, who would be more active and be responsible in the implementation of western-oriented development. Consequently, the construction hotspot has been transferred from eastern area, which is the influenced by the National Games in 2009, to western area that is infected by the development of HSRS in 2011.

4.2 Spatial Integration between Jinan and Qihe

The construction of HSRS and western urban area really bring about catalyst for the spatial integration process between Jinan and Qihe, a county in jurisdiction of Dezhou city, which is to the northwest of Jinan and separated by the Yellow River. Traditionally, Jinan's urban territory is constrained by mountains and the Yellow River, need to reorganize spatial pattern and span over natural moat to improve urbanization process. So north-crossing developing is highly positive correlated with the spatial integration process in Jinan Metropolitan Area, which is studied and advocated by scholars in previous research(Bin and Zheng, 2007). Actually, if Qihe's abutting the Yellow River could not have enabled Dezhou city's privilege of "Cities along the Yellow River" which could bring some preferential policies, Jinan would bring Qihe into its own jurisdiction. Nevertheless, the spatial integration between Jinan and Qihe is still in progressing and is gradually evident in contemporary land development. This integration process is featured by conducting bridge construction across the Yellow River and connecting new developed lands on both sides.

By the end of 2011, there would be 7 bridges in all to come across the Yellow River along Jinan's urban area, 3 of which connect Qihe. The names of these three bridges are Jianbang, Jiqi and Changqing Yellow River Bridges, respectively. At present, Jianbang Bridge has been in completion and functions as the fast way to connect Jinan with the current construction area of Qihe County. Changqing Bridges locates in the west and will link a town of Qihe County. Jiqi Bridge locates in the middle, which is the main channel between the newly developed land of Jinan and Qihe along the Yellow River in the future.

The intention and proposal of bridge construction project is mainly conducted by Jinan government, since the developers are under the guidance of Jinan during the implementation. However, regarding the spatial integration process as a win-win strategy, local initiatives within lands along the Yellow River, made by Qihe and Jinan, especially Shizhong and Changqing Districts are like mushroom in response to this trend, looking forward to creating benefits from such developments.

4.3 Land Development and Cooperation

Besides the intensive integration intention subjectively, the achievement of flood control of the Yellow River during these years objectively releases more beach land along the river, where served as flood protection area. Since Jinan and surrounding cities are typical north region where lacking water seriously, and it is estimated that water resources possessed by per capita is only 373 m³ in Jinan, even lower than the international bottom standard of 500 m³, water is a great treasure for urban landscape.

Under such circumstances, Jinan and Qihe are drafting new land use planning simultaneously along their administrative border which is just served by the Yellow River. On Jinan's side, there is a Yufu River, a Yuqing Lake Reservoir as well as West of Jinan Wetland near the riverbed, which could potentially contribute to the land development. In 2009, Huaiyin District first initiated a master plan of the wetland and proposed a 5.55 KM² area as the wetland park, featuring inland river landscape, rural leisure activities, wetland tourism and so on. Unfortunately, this plan is not authorized by Jinan's municipality, while Jinan is trying to draft another wetland plan and upgrading the wetland to national level. The new wetland master plan made by Jinan extended the planning area to 11.3 KM² and held the aim to build a public wetland park in favor of scientific education, citizen's sightseeing and idyllic experiencing. It is drafted in the plan that the government will invest more than 3/4 of the total construction capital, leaving the rest to the wetland park itself.

On Qihe's side, the newly made master plan also demonstrate the local government's ambition to extend urban area toward riverbank and implement integration with Jinan Metropolitan Area. Especially, Qihe has arranged a 70 KM² area with 21 KM² construction land along the Yellow River and denominate as "Yellow River International Ecological City", which has not been incorporated into the master plan and doesn't necessarily take up land index for the whole county. The Ecological City is projected to attract 150 thousand people, planning 4 residential clusters, commercial and service centers, tourism and leisure activities as well as green lands. Moreover, road network is also considered to connect the current pattern of Jinan across the Yellow River (

Figure 5).

Actually, the land use planning of Ecological City in Qihe derives from the subtle cooperation on land use issue along the border area, which is evident and necessary gradually. Jinan has already experienced urban sprawl process and extended the urban area towards the border, so the land remaining left is not abundant which maybe constrain future development. Particularly, the construction of HSRS will take up land of a district class airport, leaving a situation of transferring the airport and redevelop the land. As the airport would take up a great amount of land and possibly create negative affects for surrounding areas, finding a suitable place to locate it was once a tough problem. However, to the proximity to Jinan and embracing the vast land resources with anticipation of immersing into the hinterland, Qihe maneuvered in receiving the airport to move to its scope. As compensation, Qihe proposed to develop the Ecological City along the Yellow River and legitimately succeeded in extending the construction land scale.

On the other hand, the developers and stakeholders also treasure the land along the

Yellow River, foreseeing the potential value in residential and commercial utilization. Even before the whole plan is completely promulgated, several projects have been under construction, including an aquaria, a temple, a square and so on. The planning of Ecological City is the reorganization of previous scattered development and combining them into an integral part of the local scenario.

5 EVALUATION ON LANDUSE COLLABORATION AND THE INFLUENCES

Consequently, based on the quantitative research from regional scale which demonstrates radical emerging development from county level and transforms the urban system into divergence status, the local scale delineation illustrates the evolvement of the emerging land development and the formation of possible operation in land use issue. The results indicate several influences imposed by the emerging development and cooperation.

The first is that both Jinan and Qihe are engaging in land-based urbanization simultaneously, also conducting urban sprawl and spatial restructuring by means of drafting new plans. As the Capital and prefecture-level city, Jinan anticipates taking a great leap by the construction of High Speed Railway, and the HSRS is also regarded as a prospecting center in western urban area. Therefore planning for western area incites a radical spatial restructuring process, incubating high valued functions and driving away negative and low economic land use pattern. The whole process can be also recognized as the improvement of regional polarized function for the entire city, attracting more resources those including lands, capita and labors, etc. During the process, the local government always holds the authority to maintain the construction, for instance, utilizing governmental revenue to provide public facilities and building infrastructures. Market factors are following and being incorporated into the developing mechanism, supplementing capital and optimizing utilization of resources. Although the decentralization in urban governance enables more power to district level government to initiate development proposals, the city's municipality is still pursuing the leading role in plan making, expressing powerful authority in spatial arrangement. Once the wetland park is handled by the city instead of the district, the development scale and hierarchy is significantly improved.

Regarding Qihe County, cooperation on land use issue will definitely bring about positive effects on local economy. Limited to its original scale, it is constrained to develop more land and expand south-ward in order to connect Jinan and take advantage of the Yellow River directly. However, the vast land resources serve as an ideal receiving place for Jinan's transference of low productive land use, therefore the territory of Qihe has been included in the differential rent effects of Jinan's. Foreseeing the reciprocity in land use issue, Qihe is willing to accept the deal and accomplish the cooperation, in turn it can bargain with the province government of obtaining extra land use index.

Secondly, the scale expansion as well as spatial integration and restructuring in both Jinan and Qihe favor the tertiary industry, as livability is regarded as the top priority in regional

development. The wetland park plan in Jinan and the Yellow River Ecological City in Qihe suggest two local governments realize the precious area along the river and initiate leisure activities development spontaneously instead of merely ecological preservation. Hence, the land-based urbanization process dominated by the government generally improves livability in a regional scale, at least when the projects are still being proposed and planned. Because the governments are aware that livability is endowed with much emphasis by the public and will definitely attract more funds and investment, they spare no effort to facilitate the rural land development and provide public services in advance. However, it is still hasty to assert livability is the ultimate goal in these developments, since real estate projects near the natural preservation land are expected to boost up high income in revenue. Meanwhile, in order to take benefits of HSR construction, tourism is confirmed as the main industry in Shandong Province. The Capital City and surrounding counties are also responding to this policy and advocacy, trying their best to initiate landscape planning. From this point of view, livability pursuing is combined in the fast urbanization process, which will clearly approach the issue of social disparity, economic growth, environment preservation. Livability serves not only a symbol to demonstrate intensive regional relationship and simple cooperation, but also being considered as a speculative tool to provoke economic benefits and guide urbanization process in the transition from rural land to urban construction area. Therefore, livability is likely to be misrepresented as a tendentious issue being endorsed as privatization in these treasurable natural resources. Real estate development tends to formulate more gateway communities along the ecological region, when the public is deprived the right to get access to the livable and pleasant views.

Another concern relating to the disparity of livability is about the accessibility. Since lands along the Yellow River are distant to urban core region, although road construction is conducted ahead, most public citizens will still be denied to have access to the boundary natural area, and the public transportation services has not fledged enough to commute people from inner city to rural area massively. There comes that only people who have automobiles can enjoy the livable paradise randomly, reducing significantly the public intention in enjoying the livable recreational facilities.

The last but not the least argument is about the planning enforcement issue existed in the development process. Whereas lands along the Yellow River by Jinan's side are already included in the planning area and have been drafted regulatory plan, the construction activities are able to be supervised. Zonings take the main shape of such plan and generally there is no obvious violation according to the planning documents and graphics. On the other hand, lands on the other side of the Yellow River in Qihe's territory are not well-controlled since the planning area or supervision authority has not covered such boundary lands. Therefore, projects within these areas can take advantage of the defection. With the absence of planning enforcement, development is the result of project-orientation, physical isolation and ego-centered. Taking the example of current land development, some projects got to begin even before the comprehensive plan has been promulgated. Planning lagging leaves the dilemma that the physical pattern of such projects are not correspondent to the surrounding environment, which will create the problem of wasting land and low efficiency in spatial distribution. Referring to this, it is highly recommended that in order to receive high

quality urbanization outcomes, planning enforcement is extremely necessary to formalize building activities, as well statutory plans should be updated on time to regulate such develop proposals. Once the statutory plans has to reconcile a great deal of conditions and concerning about the scale issue, strategic spatial planning should be flexible in response to the developing requirement and conduct the related feasibility study. Once proved and promulgated in the statutory plans, construction can be maintained in a reasonable manner.

6 CONCLUSION

The emerging development along the boundary area between Jinan and Qihe identifies factors leading to the appearance and transformation in land use pattern under New Regionalism. Such transformation involves collaboration between governments in different administrative levels as well as responsive investment among stakeholders and developers. It also needs to recognize that collaboration in spatial planning derives from benefits exchange in the land-based urbanization process which dominated by government in China.

Specifically, planning intentions among the cities and towns are focusing on the inspiration of market mechanism to make profits and boost up local economy in the name of ecology, which will typically improve interaction and lead to spatial integration. The paper acknowledges the function the market force provides in creating open space and recreational facilities for the public, whereas there is still need of planning enforcement to formalize the development along the area.

Figure 1 Distribution of Recent Regional Developments and Spatial Planning Strategies

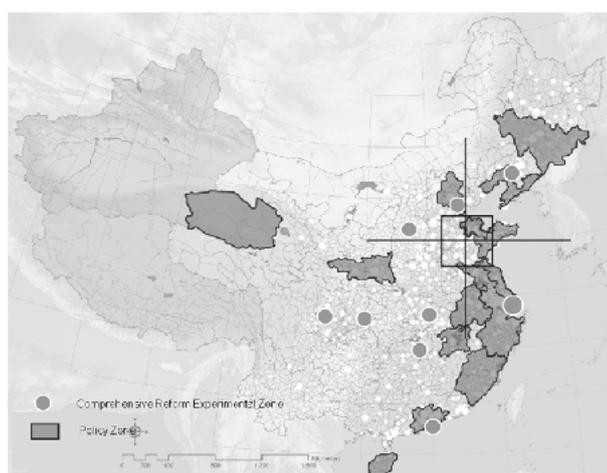


Figure 2 Geographical Location of Jinan Metropolitan Ring and Shandong Peninsular Blue Economic Zone

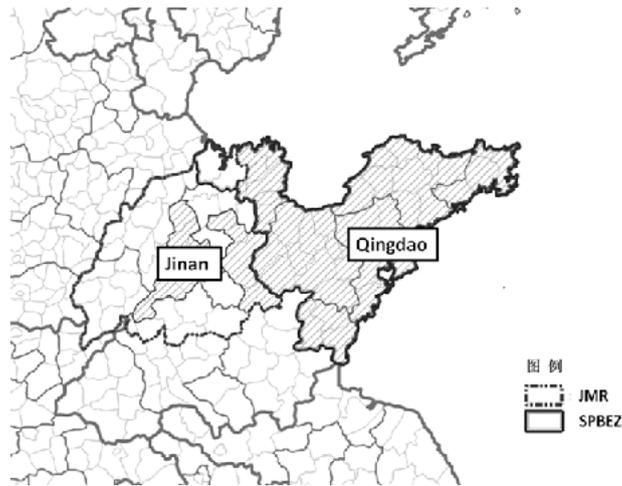


Figure 3 Rank-Size Graphs of Construction Area of JMR and SPBEZ in 2005 and 2009

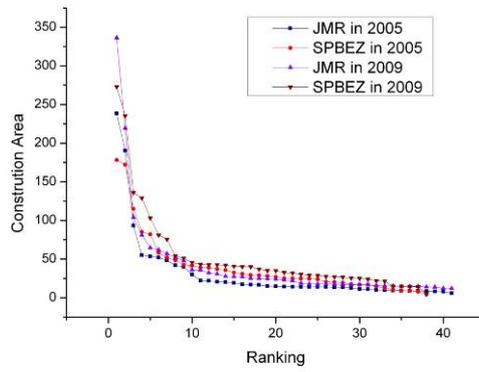


Figure 4 Comparison of Growth Direction in Planning and Situation in 1956, 1996, 2007

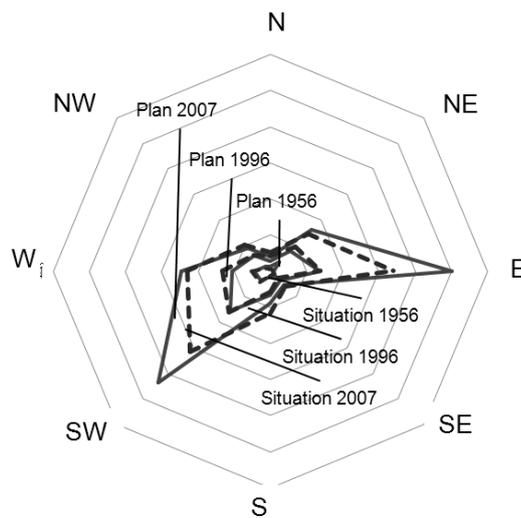
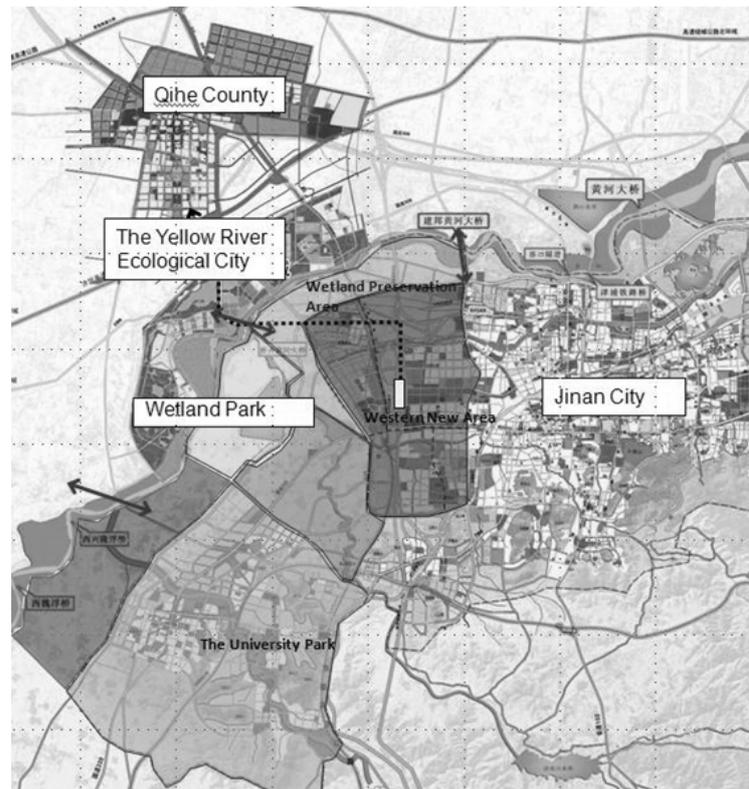


Figure 5 Outline of Land Use Planning of Jinan and Qihe



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