NEW PUBLIC SERVICE MODE IN CONVENTIONAL AGRICULTURAL AREAS: IN THE CASE OF HEZE IN SHANDONG PROVINCE

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EXECUTIVE SUMMARY

This data-driven study offers recommendations on how the Heze City can have proper public service mode to meet residents’ needs and local development.

BACKGROUND

During the new era of “13th Five-year”, China faces the following challenges: insufficient public facilities supply, irrational structure, and inadequate demand of public service, especially in traditional rural areas.

Traditional agrarian sector plays an essential role in urbanization process in China, as it has high-density population and it is a critical region in food security.

Therefore, it is necessary to replace the old mode of public service

STUDY SITE

Heze City in Shandong Province can be an excellent pilot to find a suitable new public service mode for traditional rural areas. It is a typical agricultural city with high population.

Heze City faces some challenges in the process of urbanization: low level of urbanization, migration-urbanization phenomenon, and improper public service mode.

METHOD

The author used three methods including best practice and literature review, quantitative and qualitative analysis, and public engagement with stakeholders, to develop new public service mode.

RECOMMENDATION

The new mode can be divided into two parts: basic public service mode and developing service mode.

The vertical structure of basic public service mode matches with the new urbanization pattern in Heze. The horizontal structure includes education, healthcare, culture, sports, and welfare. The developing service mode is developed based on industrial clusters.

Proper public service principles:

Principle 1: A proper public service facilities mode can match with the spatial pattern of urbanization and help to redistribute population, and improve equity of public service

Principle 2: A good public service facilities mode should meet residents’ needs and interests.

Principle 3: The developing public service mode in traditional rural areas is built from three perspectives: vocational training, innovation and entrepreneurship, and smart city, supporting sustainable development and structural optimization in urbanization pattern.

Principle 4: Excellent Public Service Delivery
1. CONTEXT

1.1 BACKGROUND

During the new era of “13th Five-year”, China faces the following challenges: insufficient public facilities supply, irrational structure, and inadequate demand of public service, especially in traditional rural areas. Conventional agricultural region means the regions that use techniques developed over decades or centuries to ensure food and sustainable yield over time. Traditional agrarian sector plays an essential role in urbanization process in China, as it has high-density population and it is a critical region in food security.

Public services and facilities are urban objects designated to fulfill supportive functions related to the health and well-being of the citizens of modern society or metropolitan area. The provision of public services and facilities in the urban environment is essential for urban development, as it has a significant impact on the quality of life that residents and others enjoy.

The traditional modes are based on “Service Radius” and “Thousand-person Index,” which match the administrative division system. “Service Radius” mode is to optimize the overall layout of facilities with a reasonable service radius convenient for people to use with reasonable commute time. Planners establish a service radius to rationally distribute public service facilities and integrate diverse social facilities and services to meet community demand for public service (Yumin & LeGates, 2013). “Thousand-person Index,” a control index of urban public facilities, refers to the construction area and land use area of each public service facilities per 1000 residents.

The former public service modes cannot fit in the current development stage. On the one hand, since the reform and opening up, the development process of traditional agricultural areas has lagged with a large number of population outflow. When a large number of people from rural areas have settled in economically developed towns, some rural villages have experienced a phenomenon called hollow communities. In those well-developed towns, the primary public service cannot meet the needs of residents due to the significant increase in population, while the population reduction in hollow villages results in the waste of basic public service.

On the other hand, with industrial transformation and upgrading in the eastern coastal areas of China, the traditional agricultural region has gradually become a focal zone to accept the former industries from east coastal, due to its excellent geographic location and abundant labor resources.

Therefore, it is necessary to build a new public service mode to promote equalization of public services and improve public services, based on the current conditions in the traditional agricultural region. Also, population redistribution through the deployment of efficient public service facilities can help to release the contractions between human and land use, reduce pressure on the ecological environment, and protect the national food supply.
1.2 STUDY SITE (CLIENT)

Heze City in Shandong Province can be an excellent pilot to find a suitable new public service mode for traditional rural areas. It is a typical agricultural city with high population. Firstly, the city has high-density population, with rapidly increasing rates. Secondly, it is a traditional agrarian city, with the most significant practical irrigation areas in Shandong Province. The total grain output in Heze City accounts for 15% in Shandong Province and around 1% in the nationwide.

Heze City faces some challenges in the process of urbanization. Except for low level of urbanization, migration-urbanization phenomenon is evident in Heze City. In 2014, the urbanization level of Heze City was 43%, which was lower than that of Shandong and the country by 12%. In the same year, more than 1.55 million people left their home to work outside, accounting for 15.7% of total population in Heze City. The majority of small towns in Heze City are self-contained regarding their administrative divisions. They are rarely laid out from the perspective of economic and urban development principles. All towns are self-centered in economic development, leading to a full gap in development levels.

The layout of public service in Heze City is based on “Service Radius.” In industrial areas, the radius is 700 to 800 meters, while in other areas, the radius is from 200 to 300 meters. With population outflow and development demand, a new mode public should replace the original one to serve residents.
As public service is essential for economic and sustainable development and agricultural cities are critical for China, the report will explore the new model of public service in the traditional agrarian zone to improve the quality of public service, based on the development trend in Heze City.

2.1 METHODS
The report used three methods of inquiry to explore new public service modes.

2.1.1 BEST PRACTICE AND LITERATURE REVIEW
The report examined similar projects and public service theories and ways from Asia, Europe, and across the world. These offer information on past and the current trend in modes of public service around the world.

There are mainly four fundamental theories related to public service allocation: supper block theory (Former Soviet Union), the method of justice (John Rawls), central place theory (W. Christaller and A.Louml), and theory of market centers (August Losch).

In western countries, scholars mainly study public service facilities from capital source, aiming population and management aspects. Greenhut et al. created the public service facilities allocation model based on welfare economy by analyzing factors influencing the allocation such as demand, cost, and benefits (Yibo, 2013). Okafor. S. I put forward using fixed points to expand public service radius. With the development of quantitative geography and behavioral geography, scholars tend to pay more attention to evaluation on public service modes. They think urban planner should combine equity and efficiency when designing public service modes. A good public service mode should have not only public leisure, inclusiveness, but also be simple and accessible for residents.

In China, public service allocation standards stipulate the detailed contents at different levels. There are some existing allocation modes based on county and town scale, such as resident-demand-oriented public service mode (basic public service and supporting public service), two-level allocation mode (urban-level and regional level), and five-level allocation mode (city, region, residential region, residential area, and residential community). Besides, some new concepts have appeared, such as life circle, central town, and central village. These new concepts arose the innovation in traditional public service allocation in China.

2.2 QUANTITATIVE AND QUALITATIVE ANALYSIS
The report used GIS and SPSS to do quantitative analysis. The data were collected from survey and engagement with residents. Based on analytical results, the report selected major towns in Heze City and built a new administrate system (major town-new rural community (general town and central village)-rural residential area). The new public service allocation will match the new administrate system.

2.2.3 PUBLIC ENGAGEMENT WITH STAKEHOLDERS
The quantitative data include demographic profile, economy, and public service facilities conditions in Heze City. The qualitative data were collected from public engagement with residents in the city. The residents expressed
The new public service should help citizens to meet their shared interests rather than to control the society (Denhardt and Denhardt, 2000). The framework is highly normative and value-driven with emphasis on engaging citizens as the primary focus. Additionally, good quality local public services, including education and training opportunities, health care and community facilities, are identified as one of the key elements for crime reduction and community safety.

3. ANALYSIS

Table 1. New Public Service

<table>
<thead>
<tr>
<th>Theoretical foundations</th>
<th>Democratic theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rationality and models of human behavior</td>
<td>Strategic rationality, citizen interest</td>
</tr>
<tr>
<td>The conception of the public interest</td>
<td>Dialogue about shared values</td>
</tr>
<tr>
<td>To whom are civil servants responsive?</td>
<td>Citizens</td>
</tr>
<tr>
<td>Role of the government</td>
<td>“Serving,” negotiating and brokering interests among citizens</td>
</tr>
<tr>
<td>Mechanisms for achieving policy objectives</td>
<td>Building coalitions of public, non-profit private agencies</td>
</tr>
<tr>
<td>Approach to accountability</td>
<td>Multifaceted-public servants guided by law, values, professional norms and citizen interests</td>
</tr>
<tr>
<td>Administrative discretion</td>
<td>Discretion needed but constrained and accountable</td>
</tr>
<tr>
<td>Assumed organizational structure</td>
<td>Collaborative structures with shared leadership</td>
</tr>
</tbody>
</table>

Source: Adapted from Robinson (2015, p.10)
3.1 PRINCIPLES

From best practices and literature review and civic engagement, traditional agricultural public service principles are as following to describe what is a good public service mode:

Principle 1: A proper public service facilities mode can match with the spatial pattern of urbanization and help to redistribute population, and improve equity of public service.

Principle 2: A good public service facilities mode should meet residents’ needs and interests.

Principle 3: The developing public service mode in traditional rural areas is built from three perspectives: vocational training, innovation and entrepreneurship, and smart city, supporting sustainable development and structural optimization in urbanization pattern.

Principle 4: Excellent Public Service Delivery

The structure of developing public service mode (Principle 3)
3.2 FRAMEWORK OF THE BASIC PUBLIC SERVICE MODE

3.2.1 VERTICAL STRUCTURE OF THE NEW MODE

The public service facilities configuration matches with urbanization spatial pattern in the city. When collocating public service facilities in traditional agricultural regions, planners will consider from two spatial levels: village as a living unit and town as a clustering area of population and resource for development. There are three types of urbanization pattern in these regions: general town-range mode, town-village two-level mode, and town-district-village three-level mode. Based on the current development trend, the urbanization pattern in is “central area in the city-county-major town-new types of community (general town and central village)-rural residential point”. This new pattern can be the vertical structure of the proposed public service mode.

3.2.2 HORIZONTAL STRUCTURE OF THE NEW MODE

The basic public service includes education, healthcare, culture, sports, and welfare. These facilities can be divided into two types, including town-based service facilities and radius-dependent facilities, according to facilities types, service purpose, and space requirements. Radius-dependent facilities in the village serve residents in daily life, while town-based service facilities in town help economic development and residents as well.

The horizontal structure should meet the following criteria: fully considering the characteristics of living and spatial patterns of the population in town and village; combining town-based and radius-dependent service to allocate facilities.
The outflow in the agricultural zone is mainly made up of young labor and tends to be younger. The loss of a large number of young labor results in the aging population and young population in the rural areas. On the other hand, the return flow is almost adults without professional skills. This phenomenon has led to the lack of high-quality population to support rural development and agricultural modernization. Therefore, during the new urbanization process, the traditional agricultural zone should strengthen the development of agricultural industrialization, promote scale operation, and improve the training of residents’ skills. To sum up, it is necessary to deploy developing public service facilities to guide the economic development in traditional agricultural areas.

Learning from Shenzhen Special Economic Zone, I selected industrial aggregation zone as a vector to supply developing public services. Basic infrastructural service facilities in the industrial zone can be regarded as the developing service facilities. Highways, electrical power, and communications facilities should be improved. Also, the government should promote municipal facilities such as water supply and drainage systems, sewage treatment systems, gas supply, heating, street lighting, and garbage disposal in industrial clusters, realizing the full construction of hardware facilities. Regarding software aspects, the government not only provides support for companies by land use policy and taxation policy but also offers employees in industrial clusters with vocational education to improve cultural and professional qualities. This action can provide talents for the development of industrial groups.
4 RECOMMENDATIONS

The new public facilities mode is built following the basic and developing public service facilities framework.

4.1 BASIC PUBLIC SERVICE

The new pattern of four-in-one urban-rural integration pattern, “central city (central city and subcenter city) + county (general county) + small town (key town) + rural new community (general town and center village), can enhance the agglomeration capabilities in central city, cultivate subcentral cities, and accelerate the development of towns, especially key towns.

Table 2. The new pattern of urban and rural areas in Heze with features

<table>
<thead>
<tr>
<th>Level</th>
<th>Specific Level</th>
<th>Service Radius</th>
<th>Service function and characters of industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>City centre</td>
<td>Central area</td>
<td>The whole city + boundaries with other provinces</td>
<td>Service function + industrial function</td>
</tr>
<tr>
<td></td>
<td>Subcentral area</td>
<td>economic zones</td>
<td>Service function + industrial function</td>
</tr>
<tr>
<td>County</td>
<td>County</td>
<td>County</td>
<td>Living function + production function + industrial function</td>
</tr>
<tr>
<td>Town</td>
<td>Major town</td>
<td>The whole rural area</td>
<td>Living function + industrial function</td>
</tr>
<tr>
<td>Rural community</td>
<td>General town</td>
<td>Surrounding rural area</td>
<td>Agricultural industry function + basic living function</td>
</tr>
<tr>
<td></td>
<td>Rural community</td>
<td>Surrounding rural area</td>
<td>basic living function</td>
</tr>
</tbody>
</table>
4.1.1 MAJOR TOWNS SELECTION

The classification of cities and towns in Heze City starts from two aspects: development conditions and development potential. For all types of existing data in Heze City, I selected suitable indicators from the three points, including resource enrichment, economic development level, and social development level, to establish development condition index system. Then I used SPSS (factor analysis) to calculate the development score of each town.

Development potential index system was developed from the three aspects: population, economic development level, and traffic conditions. The related data was analyzed by SPSS to calculate the potential level scores of each town. According to the results of the two evaluations, the hierarchical structure of each town in Heze City was divided. As shown in the below table: twenty-eight major towns and one hundred forty general towns.

More details can be seen in appendix.

<table>
<thead>
<tr>
<th>Level</th>
<th>Name of Town</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary major town (excellent foundation with large development potential)</td>
<td>Shatu Town (Mudan District), Zhuangzhai Town (Cao County), Longgu Town (Juye County), Luling Town (Mudan District), Wenshangji Town (Chengwu County), Caiyuan Township (Dongming County), Fugang Town (Shan County), Huang’an Town (Yancheng County), Datian Town (Chengwu County), Wushengqiao Town (Dongming County), Luan Town (Dingtao County), Qinglu Town (Cao County), Dasheji Town (Juye County), Fuguantun Township (Fucheng County), Chenji Town (Dingtao County), Huanggang Town (Sing County), Zhengying Town (Yancheng County), Guocun Town (Shanxian County)</td>
</tr>
<tr>
<td>Secondary major town (good foundation with good development potential)</td>
<td>Huangzhen Town (Mudan District), Wudian Town (Mudan District), Huiji Town (Mudan District), Pulianji Town (Cao County), Dinglichang Town (Yancheng County), Guyingji Town (Cao County), Huangqi Town (Mudan District), Pandu Town (Lucheng County), Taoyuan Jizhen (Cao County), Penglou Town (Lucheng County)</td>
</tr>
</tbody>
</table>
4.1.2 BASIC PUBLIC SERVICE MODE

Basic public service includes education, healthcare, culture, sports, and welfare. The mode of basic public service is shown in the right graph. The table represents the details of basic public service mode.
### Table 4. Basic public service mode in Heze

<table>
<thead>
<tr>
<th>Facilities Types</th>
<th>Major Town</th>
<th>New Rural Community</th>
<th>Rural Residential Point</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Healthcare facilities</strong></td>
<td>Radius-dependent: Health Service Station</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Town-based service: Hospital</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td><strong>Education facilities</strong></td>
<td>Radius-dependent: Kindergarten</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Primary school</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Junior high school</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Town-based service: High school</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Training facilities</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Vocational education</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>Cultural facilities</strong></td>
<td>Radius-dependent: Comprehensive cultural activity station</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Town-based service: Cultural centre (including library and youth activity centre)</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>Sports facilities</strong></td>
<td>Radius-dependent: Community sports centre</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Town-based service: Sports centre</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>Welfare facilities</strong></td>
<td>Radius-dependent: Senior activity centre</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Town-based service: Social welfare institute</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>Nursing home</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

- ● Must-have
- ○ Optional
4.2 DEVELOPING PUBLIC SERVICE

Industrial zones are an important place, as it can help to accelerate economic development and improve competitive industrial power. This type of zone in Heze has the following characteristics: developing, traditional labor-intensive, agricultural, and distributing loosely. Although industrial zone in Heze is well-developed, it has some shortcomings. Firstly, the industries in the zone are mainly low-end traditional (poor innovation ability, short industrial chain, and low add-value product. Secondly, many managers in the companies have the low level of education with low professional quality. Thirdly, the city needs a significant amount of funding to invest in enterprises at their initial stage of rapid development in industrial clusters. However, most of these enterprises belong to private SMEs and are regarded as high-risk investment objectives. The governmental fund is low, and there are few private funds available. As the government is in financial difficulties, it cannot support the development of the industrial zone. Lastly, public service in Heze City, including basic public service and professional training in the industrial zone, lags behind.

Therefore, Heze City should take the following steps. In terms of hardware, it should strengthen the construction of facilities, especially roads, electricity, and communication, to support the development of industrial areas. Concerning software, the government should give financial support to the industrial-zone development by providing proper financial policies. It can carry out vocational education and training on the labor force in industrial clusters to improve professional quality and educational level.

Currently, there are 36 vocational schools, such as Zhongyou Vocational School in Heze City, mainly located in the county districts. However, occupational schools are not established in major towns that need a high-quality workforce. Besides, financial difficulties in counties and districts in Heze City have led to a severe shortage of funding for vocational schools, especially private professional schools. Insufficient teaching hardware has seriously affected the quality of vocational education. Therefore, in the allocation of vocational education, training facilities need to be configured to ensure the quality of vocational education.

Major towns need be equipped with training facilities and vocational education. New rural communities (general towns and central villages) will be equipped with training facilities. Vocational education will be provided in villages where there are a large number of returnees, and large industrial clusters are developed. Training facilities will also be provided in rural residential areas.
5. REFERENCE


Weidong Chen & Dawei Zhang (2008). Community public service facilities categories and allocation: comparison between urban and rural area. Journal of Huazhong Normal University(Humanities and Social Sciences), Editorial E-mail, 2008(01)


## 6. APPENDIX
### MAJOR TOWN SELECTIONS

**ASSESSMENT OF DEVELOPMENT CONDITIONS IN HEZE CITY**

The index of development conditions in Heze includes registered population of the built-up area (10,000 persons), registered population of the town (10,000 persons), the water supply penetration rate (%), the green coverage rate of the built-up area (%), the gas penetration rate (%), and household garbage treatment rate (%), domestic sewage treatment rate (%), per capita net income of farmers, disposable income of urban residents (million), proportion of non-agricultural output value, fiscal revenue (million).

<table>
<thead>
<tr>
<th>Level</th>
<th>Score Range</th>
<th>Number of Towns</th>
<th>Name of Towns (including scores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>1~4</td>
<td>15</td>
<td>Shatu Town (1.01), Zhuangzhai Town (1.12), Guyingji Town (1.28), Fugang Town (1.29), Datianji Town (1.96), Wenshang Town (1.18), Longgu Town (1.6), Huang’an Town (1.4), Yuhuangmiao Town (1.63), Luan Town (1.08), Caiyuan Market Town (1.48), Huangzhen Town (3.32), Lucheng Town (1.8), Luling Town (1.2)</td>
</tr>
<tr>
<td>Level 2</td>
<td>0~1</td>
<td>40</td>
<td>Huangpi Town (0.88), Dusi Town (0.17), Malinggang Town (0.6), Huji Town (0.06), Pulianji Town (0.15), Qingdaiji Town (0.34), Taoyuanji Town (0.4), Weiwan Town (0.36) etc</td>
</tr>
<tr>
<td>Level 3</td>
<td>-1~0</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>Level 4</td>
<td>-2~-1</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Level 5</td>
<td>&lt;-2</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
**ASSESSMENT OF DEVELOPMENT POTENTIAL IN HEZE CITY**

The index of development potential in Heze City includes population density (person/square meter), number of established towns that have prepared master plans, temporary residents (ten thousand people) in towns, investment in productive buildings (km²), transit accessibility (highway, train and airport), driven by surrounding areas (industrial areas, city central and port), town/village area (km²), number of buses in towns.

<table>
<thead>
<tr>
<th>Level</th>
<th>Score Range</th>
<th>Number of Towns</th>
<th>Name of Towns (including scores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>1.5~6</td>
<td>9</td>
<td>Wudian Town (1.72), Wenshang Town (1.59), Chenji Town (2.09), Nanwangdian Town (2.55), Dongming Town (1.7), Datan Town (1.72), Huangzhen Town (5.66), Lucheng Town (2.39), Luling Town (1.68)</td>
</tr>
<tr>
<td>Level 2</td>
<td>1~1.5</td>
<td>10</td>
<td>Shatu Town (1.01), Longgu Town (1.2), Yangzhuang Town (1.04), Zhangying Town (1.13), Penglou Town (1.06), Lang Town (1), Huangdian Town (1.29), Fangshan Town (1.21), Luquan Town (1.48), Wushengqiao Town (1.29)</td>
</tr>
<tr>
<td>Level 3</td>
<td>0~1</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Level 4</td>
<td>-2~0</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>Level 5</td>
<td>&lt; -2</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>