The analysis of the Land Use Mode and Enterprise Operation Condition on the Collective Construction Land of Gaoliying Town, Beijing

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ABSTRACT: China's land policies propose to establish uniformed market for both urban and rural construction land to promote the transaction collective construction land in towns and villages based on land quantity control and quality promotion. The collective construction land use of Gaoliying town is less efficient when compared with national construction land in it. This paper focuses on the Gaoliying collective construction land use mode and enterprise operation condition on it. Firstly, It analyses the geographical, administrative, social and economic, and enterprise operation condition of Gaoliying Town. Secondly, it aims to evaluate the enterprise efficiency on collective construction land of Gaoliying based on comprehensive index for evaluating enterprise operation condition of each village and industry sector, multi-factor overlay analysis of individual enterprises operation condition, Identification of Low efficiency enterprises. Thirdly, it detects the fundamental problem of social and economic aspects on the village administration level of Gaoliying town accounting for low efficiency. And finally, it proposes suggestions on collective construction land and assets management for future strategies based on the case study of Dongshenxiang town with similar starting situation but different planning and market interventions.

KEYWORDS: Gaoliying Town; Collective Construction Land Use; Enterprise Operation Efficiency; Collective Assets Management

1.Introduction

With the expansion of Beijing urban area, the two green belt buffering zones are being subjected to increasing uncertainty with rising land value, intensity of urban construction and influx of migrating populations. Gaoliying town is chosen as the key town of Shunyi district in the "Beijing Master Plan 2004" and just locates at the green belt buffering zone as an interface of both urban and rural area. The collective construction land, which is an important development resource for towns, is required to be planned more economically and efficiently by many China' urban and town development related policies. The third plenary session of the 13th central committee of the Chinese community party proposes to establish the uniformed market for both urban and rural construction land to allow the transaction of the collective construction land with the equal price and terms as the urban construction land. Both the central conferences on urbanization and rural work highlight the necessity of quantity control of the construction land and quality promotion of the existing land use efficiency through the upgrading of the land use structure.

For the collective construction land in Gaoliying town, as is indicated in the government research documents1, the land use efficiency for agriculture, industry and housing is still low, and the revenue distribution is uneven due to the overcharging of the land leasing fee by the government, disproportional profit gain by the real estate developers, unsustainable income channel of villagers and most importantly occupation of the collective construction land by non-town enterprises and corporations which are city-owned or nation-owned.

Thus the management and rearrangemnet of the collective construction land should be the key element for the next stage master plan of Beijing and the towns on periphery for the guarantee of the properly distributed welfare. In Gaoliying town, there are three layers of the collective construction land: Town, Beijing city, Shunyi District. However the town-owned collective construction land is further divided into central collective construction land for village use and for national projects, such as Jinma Industrial Park. In comparison with Jinma Industrial Park for collective construction land use efficiency (table1), the average income, profit and tax of enterprises on other collective construction land are relatively lower, which reflects the less organized and dispersed land use management pattern.

So this paper focuses on the Gaoliying town collective construction land use mode and enterprise operation condition on it. It aims to analyze the mechanism for the low efficiency of the collective construction land use of Gaoliying town firstly, and proposes suggestions for future strategies based on the case study of Dongshenxiang town with similar starting situation but different intervention policies.

2.Background of Gaoliying of Town

2.1 Geographical and Administrative Condition

Gaoliying town locates at the east north of Beijing and the intersection of the Jingcheng expressway, west to the Shunyi new town, with the strategic position (figure1) in Beijing airport economic zone and Wenyu river ecological corridor. The area is 61.8 km2 with 25 administrative villages (figure2). Gaoliying town has a

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1 Research Report of Village Social and Economic Development in Gaoliying Town, 2015

population of 33,832 permanent residents, 8,640 families and 19,325 employees. There are 3 villages with more than 2,000 registered residents.
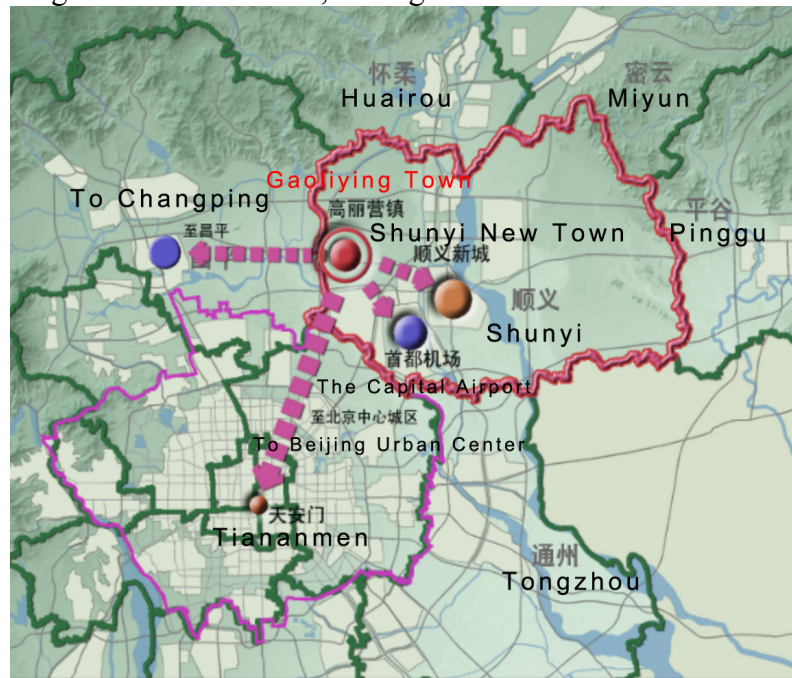

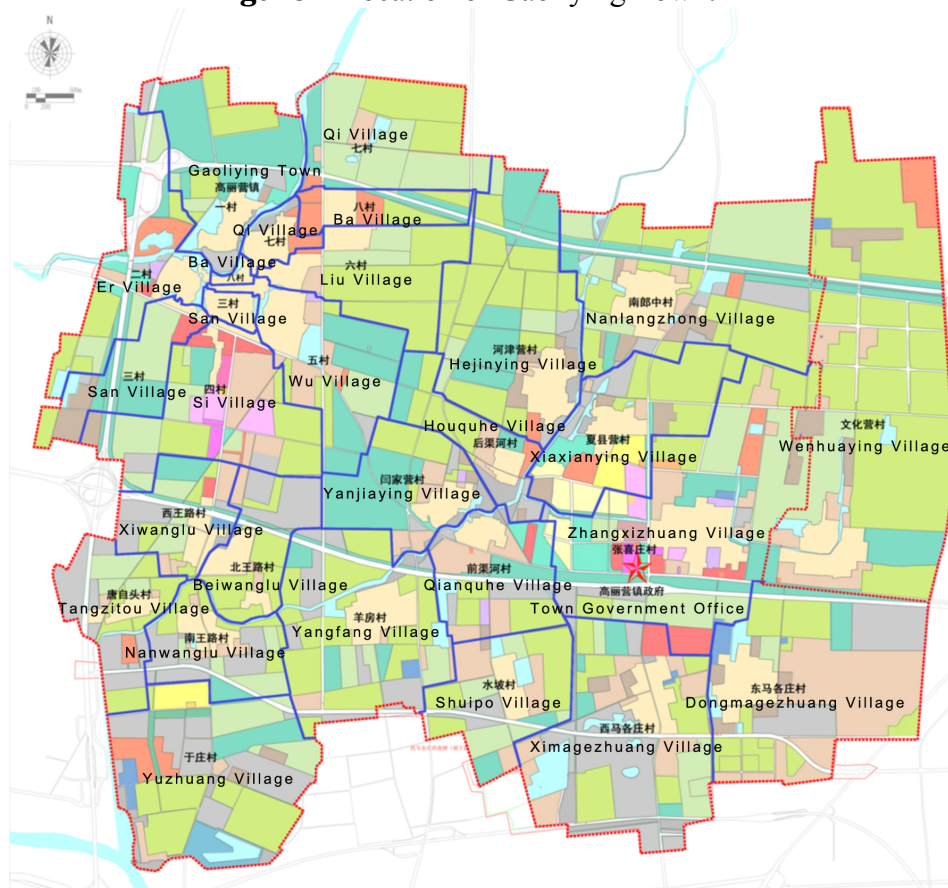**Figure1.** Location of Gaoliying Town.

Figure2. Map of Administrative Villages of Gaoliying Town.

Economic Condition of Enterprises on the Collective Construction Land		Economic Condition of Enterprises on Jinma Industrial Park	
	Average Value（10thousand yuan）		Average Value（10thousand yuan）
Income	489.7	Income	8818.2
Profit	48.7	Profit	659.1
Tax	32.2	Tax	613.6
	Average Value（10thousand yuan/hectare）		Average Value（10thousand yuan/hectare）
Income per Area	1393.3	Income per Area	2135.4

Table1. Land Use Efficiency Comparison between Collective Construction Land and Nation-owned Construction Land of Gaoliying Town.

2.2 Social and Economic Condition

The figure 3 shows that the urbanization rate has reached 41.5% and there are three villages whose registered urban population outweighs rural population. The economic situation is also polarized within all villages, as indicated in the GDP and average income per capita statistics (figure 4,5). The total GDP is 362.18 million yuan. Some village (Si village) reaches 100 million while the sum of other six villages' GDP is less than 1/10 of it. The average ration of debt to net worth is 14% and some villages (Yangfang village, Shuipo village, Zhangxizhuang village) reach 50%. The average income per capita is 12.3 thousands while Si village is overwhelmingly higher than average. Additionally, most villages are facing the gap of low average native employment rate (45.5%) even with sufficient local labor force market (figure 6).
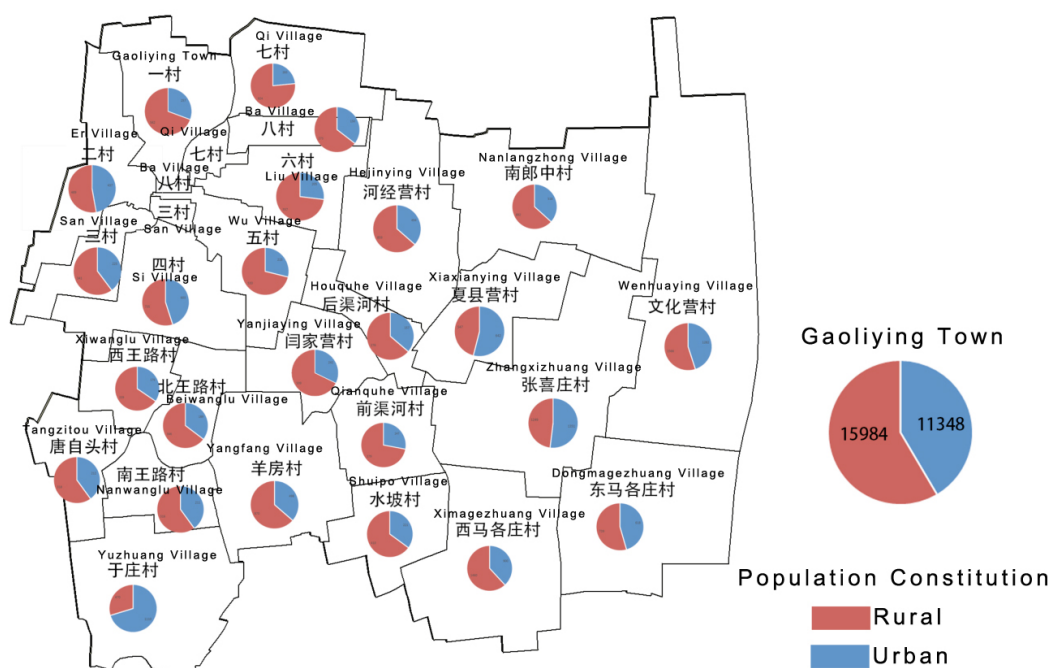

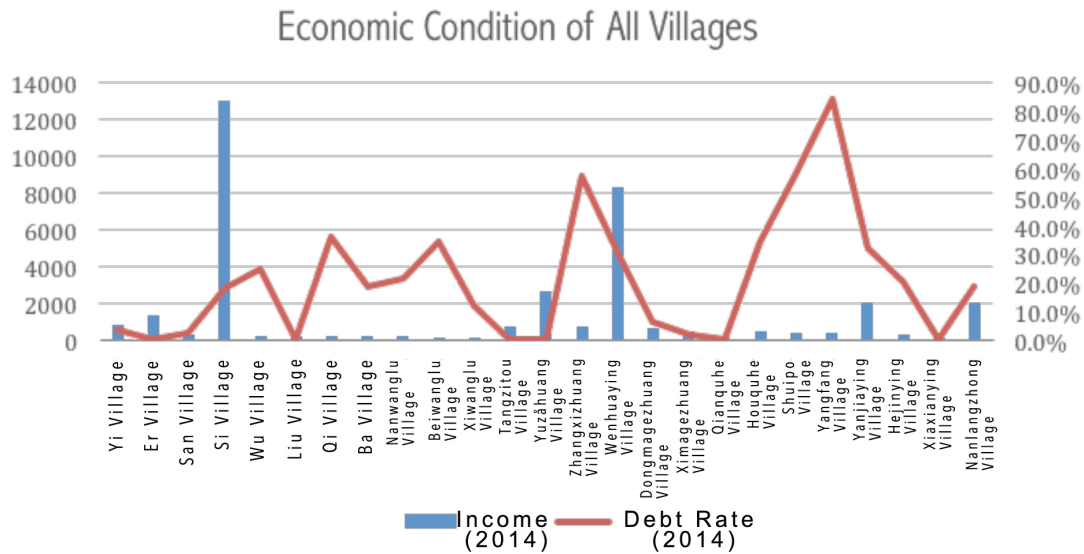**Figure3.** Map of Urbanization Rate of Villages in Gaoliying Town.

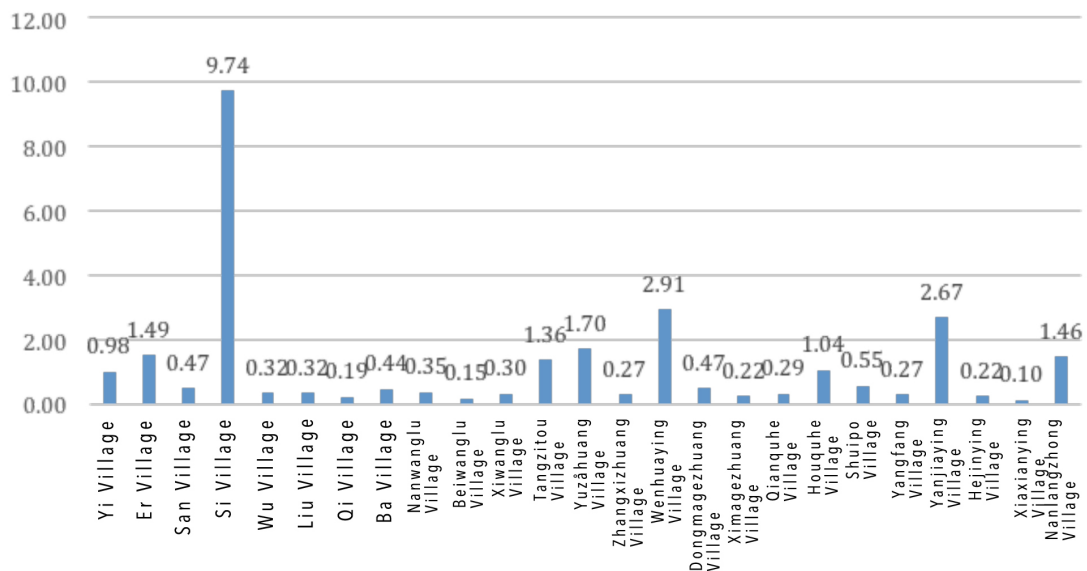**Figure4.** Economic Conditions of All Villages in Gaoliying Town.

Figure5. Income per Capita of All Villages in Gaoliying Town.
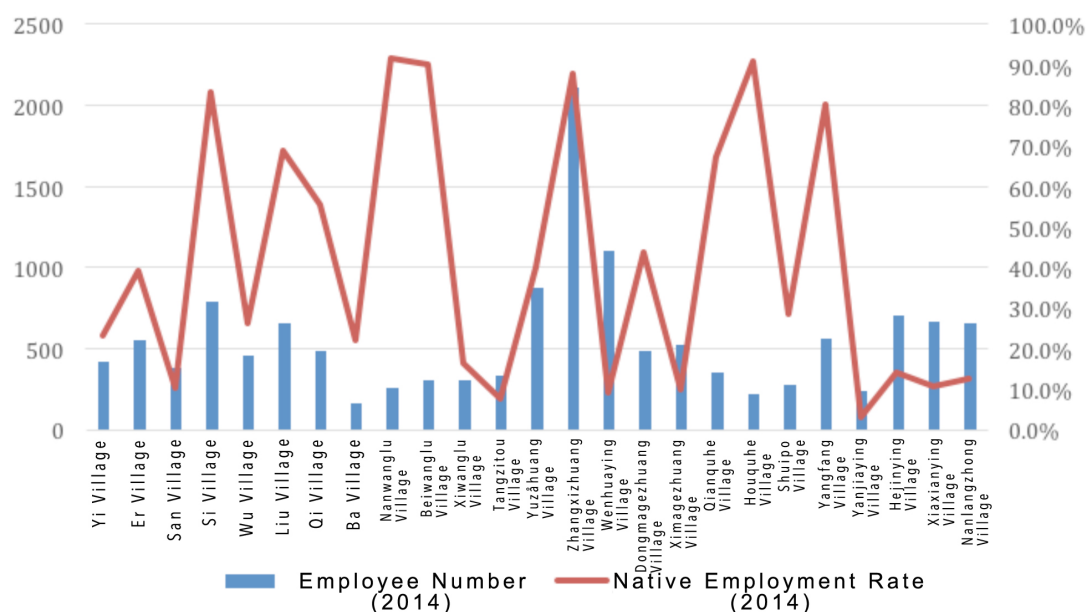
Figure6. Number of Employees and Native Employment Rate of All Villages in Gaoliying Town.

2.3 Enterprise Operation Condition

The following analysis of enterprise operation condition is based on the data collected in the enterprise operation research of the year 2014 by the town government. There are 190 entity enterprises on the collective construction land with 53% of industrial companies and 47% of service companies.

The density and number of enterprises in southeast region is much higher (figure 7). And the industry companies are over 50%, among which the manufacturing industry accounts for majority (figure 8). The non-farming industry has boomed and become the major industry for Gaoliying town, mostly centered at Jinma industrial park, town center and airport economic zone at the southeast region while less centralized at potential high-speed railway economic zone in the northwest region.
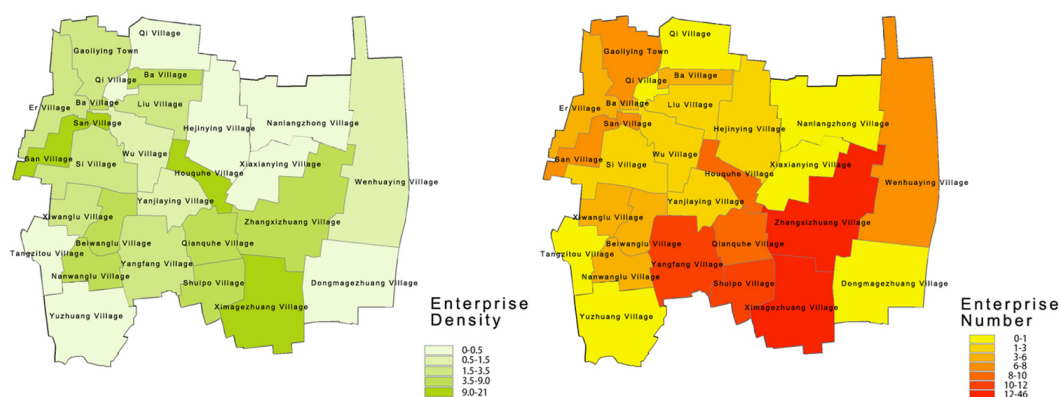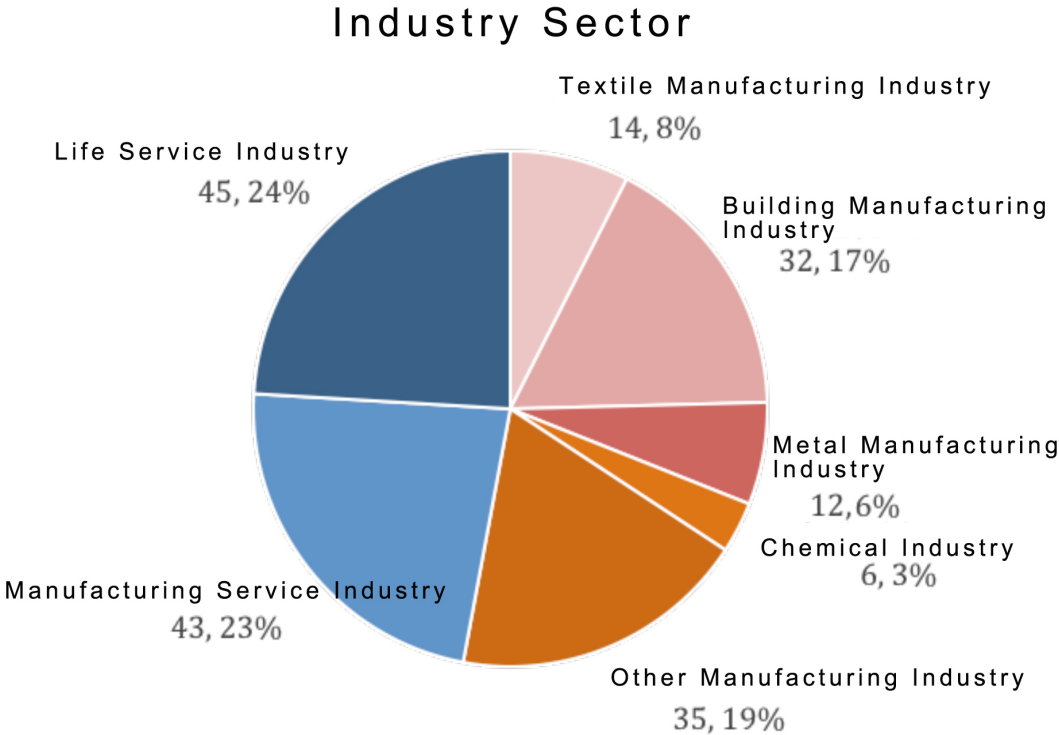
Industry Sector

Figure8. Percentage of Al Industry Sectors of Gaoliying Town.

For the enterprise operation condition, figure 9 shows the geographical location of four types of the enterprises, namely private ownership, collective ownership, national ownership and mixed ownership. And most are privately owned. According to the percentage of all the industry sectors (figure 10), the collective ownership industry mostly belongs to in textile manufacturing. And private ownership industry is dominated mostly by life service industry, manufacturing service industry and other manufacturing industry.
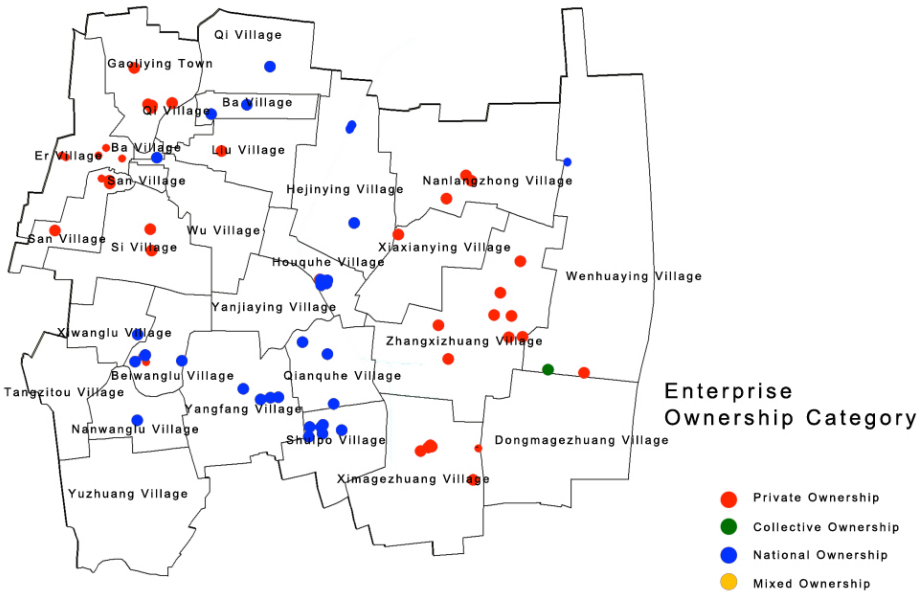

Figure9. Map of Four Enterprise Ownership Categories in Gaoliying Town.
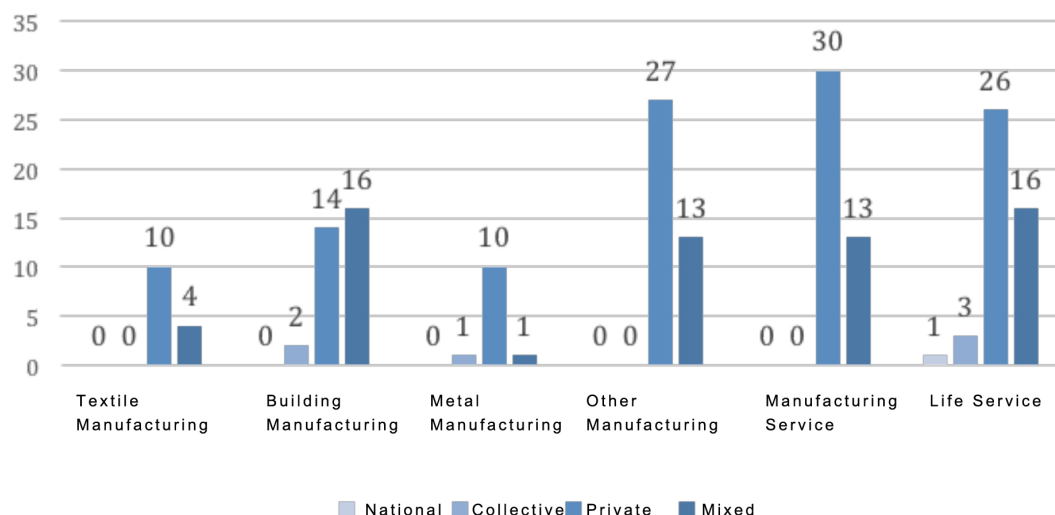
Figure10. Property Right Category of each Industry Sector of Gaoliying Town.

Figure 11 shows the map of the enterprise operation status. 88% are functioning normally while 17 enterprises are suspended. Additionally most are profitable while 13% are in the red. In the industry sector, building industry and other manufacturing industry are the most profitable ones; and in the service industry, many enterprises could make ends meet to achieve the balance (figure12).
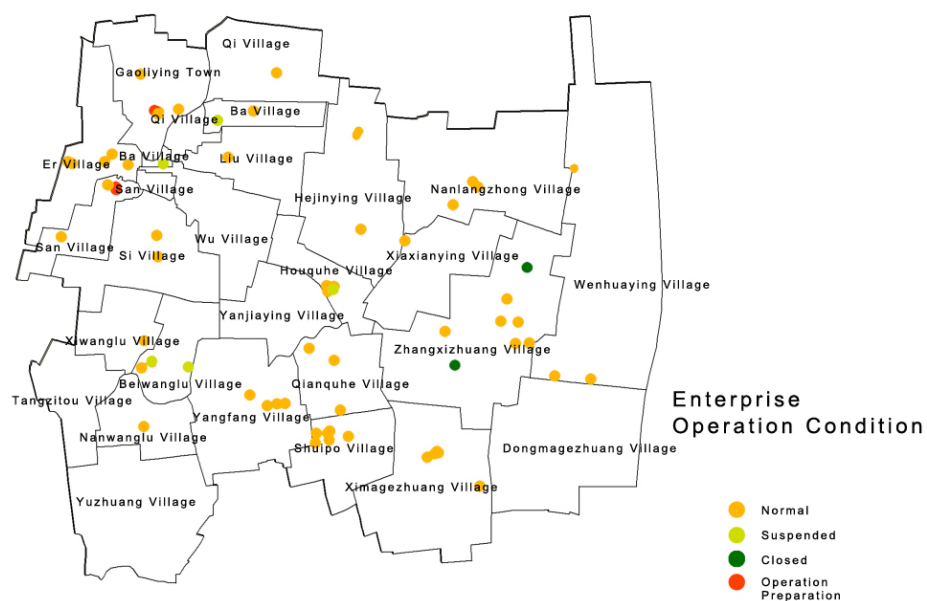

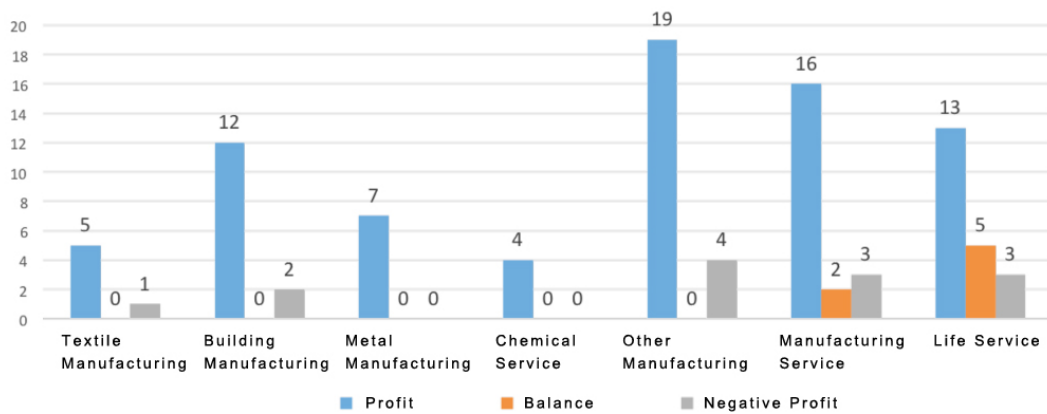**Figure11.** Map of the Enterprise Operation Status of Gaoliying Town.

Figure12. Status of Profit and Loss of All Sectors in Gaoliying Town.

3.Evaluation of Enterprise Efficiency on Collective Construction Land of Gaoliying Town

Based on the above situation analysis, this paper subsequently establishes the evaluation framework to further examine the enterprise operation efficiency on the collective construction land.

3.1 Comprehensive Index for Evaluating Enterprise Operation Condition of Each Village and Industry Sector

To integrate the income, profit, tax and GDP per area, the comprehensive index of evaluation of enterprise operation condition is established as followed wherein i(I) is the income, p(P) is the profit, t(T) is the tax, and g(G). 1 represents the average value. So if S<1, the enterprise is defined as low efficiency. If S>1, the enterprise is defined as high efficiency.

$$S=(i/average(I) +r/average(P) +t/average(T) +g/average(G))/4$$

Figure 13 shows the statistics of the number and percentage of the index for all enterprises at the same intervals. Conclusion could be clearly drawn that a small proportion of enterprises has contributed to majority of production. The percentage of low efficiency enterprise is over 70%, among which the least efficient enterprises (0~0.1) are the majority. High efficiency enterprises only account for less than 30%, while making more than 80% production contribution. There are only 5 enterprises which rank higher than 4 and make more than 40% production contribution. The polarity between high efficiency and low efficiency enterprises is sharp and most of low efficiency enterprises need to be rearranged or incorporated for better management.

Enterprise Index Number at the Same Interval of Gaoliying Town
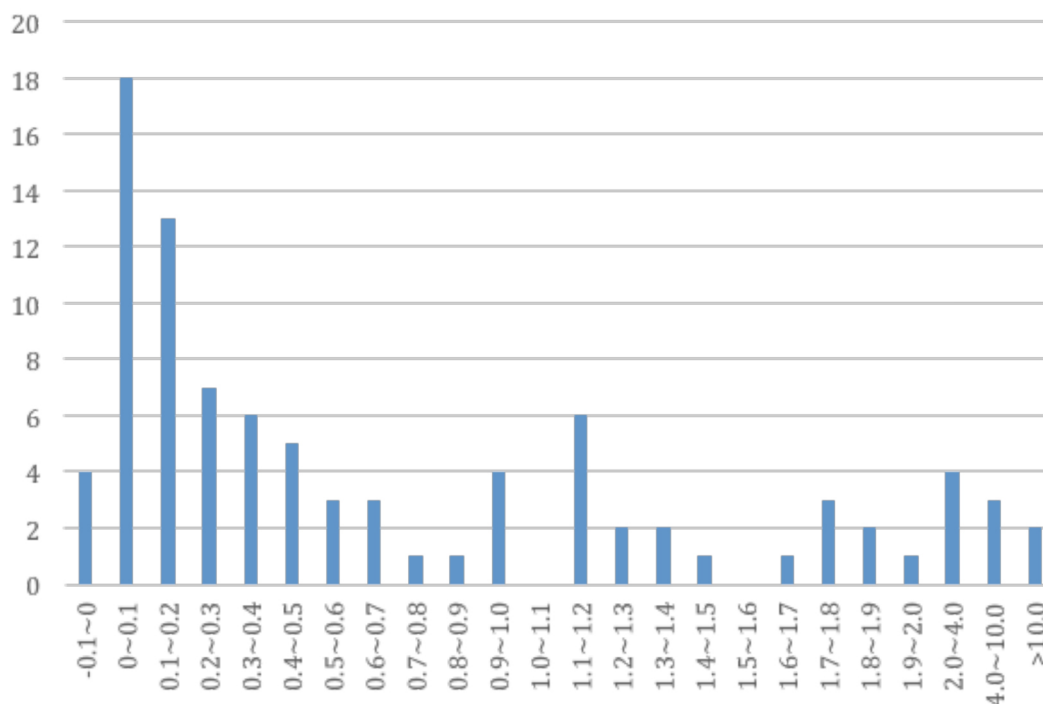
Enterprise Index Percentage at the Same Interval of Gaoliying Town
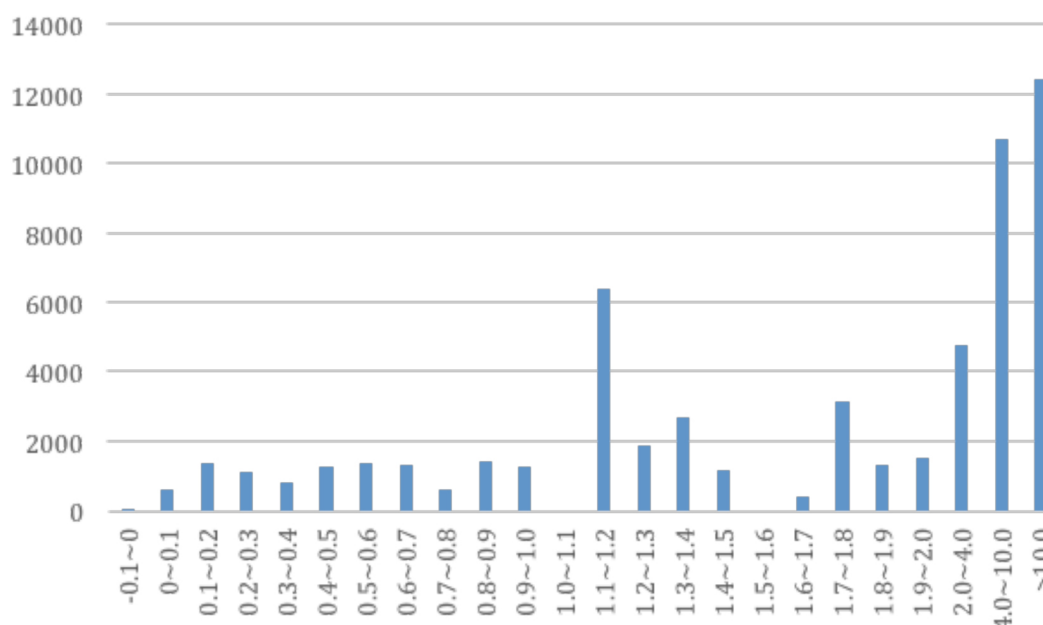
Figure13. Statistics of the Number and Percentage of the Index for All Enterprises at the Same Intervals of Gaoliying Town.

To further estimate the condition of each village, it selects the enterprises by evaluation index higher than 0.5 or lower than 0.5 to identify the high efficiency and low efficiency enterprises for calculating the percentage of them, as showed in figure 14. This provides the reference to the future planning policies: the enterprises of five villages (Nanwanglu village, Beiwanglu village, Wenhuaying village, Yangfang

village, Hejinying village) could be rearranged or merged due to the low efficiency bulk. As for three villages (Er village, Xiwanglu village, Shuipo village), the low efficiency enterprises could be integrated by high efficiency enterprises in the future due to the efficiency polarity.

Number and Percentage of Low Efficiency Enterprises
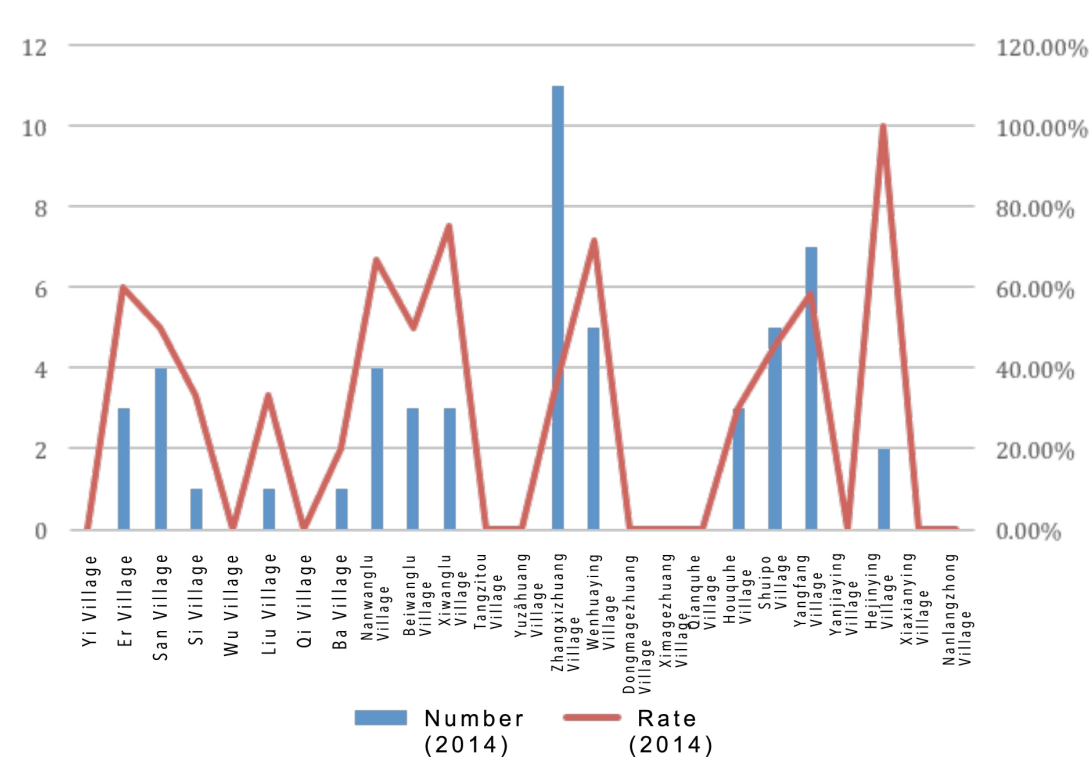
Number and Percentage of High Efficiency Enterprises

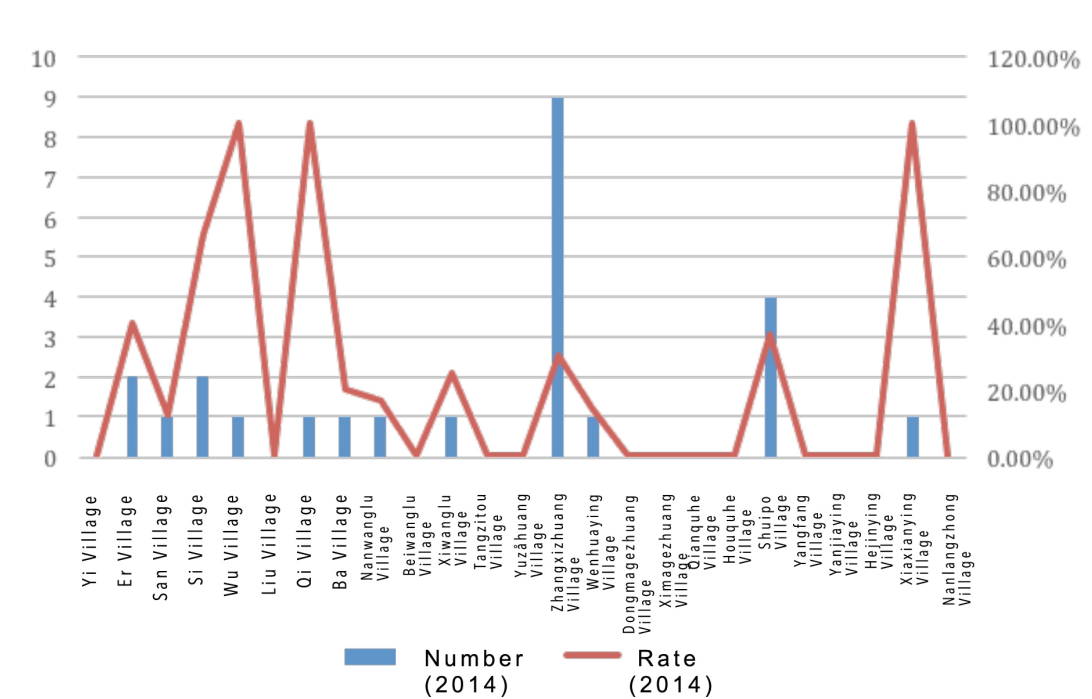**Figure14.** Number and Percentage of High and Low Efficiency Enterprises of Gaoliying Town.

Figure 15 also indicates the efficiency index distribution of every industry sector. The majority of the service industry is low efficiency enterprises, which even take 75% in manufacturing service industry. In contrast, the other manufacturing industry is functioning relatively better and high efficiency enterprises of furniture manufacturing industry account for over 50%. This indicates that even though the service industry enterprises are most self-sustained and financially profitable, but most of them are low efficient.
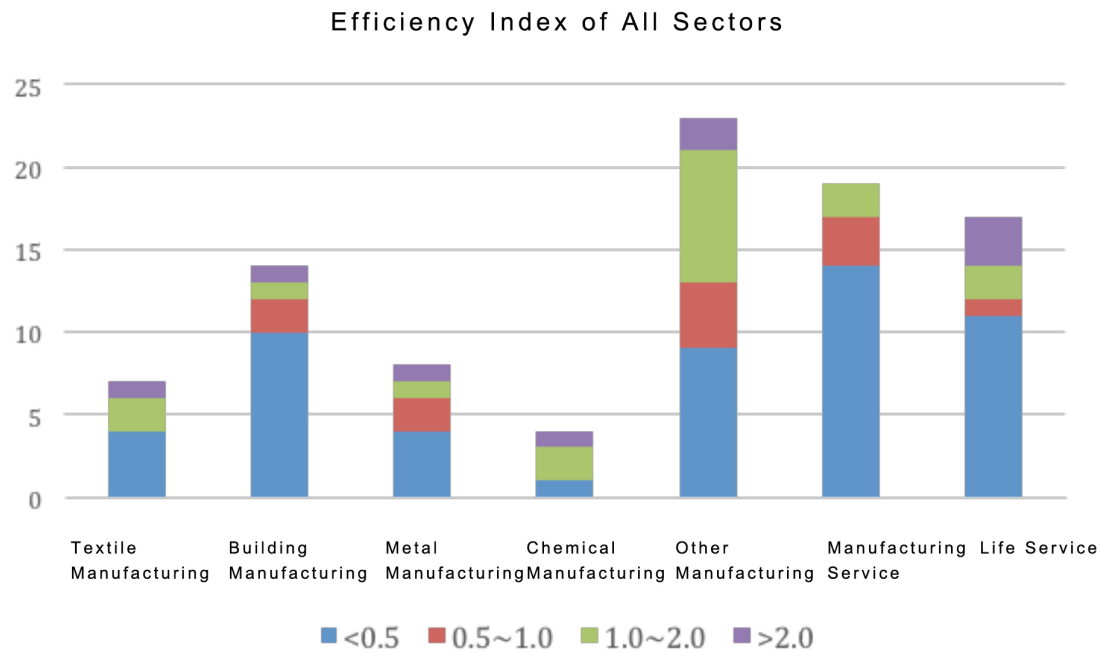
Figure15. Efficiency Index Distribution of Every Industry Sector of Gaoliying Town.

3.2 Multi-factor Overlay Analysis of Individual Enterprises Operation Condition

3.2.1 Index of AHP Model

To evaluate the land use mode efficiency, this paper applies the analytic hierarchy process (AHP) method, with details showed in figure 16. The goal layer is the overall land use efficiency (A), and the criteria layer is divided into enterprise economic effect (B1), land use economic effect (B2), and enterprise tax contribution to government (B3). In the alternative layer, B1 is further divided into enterprise yearly income (C1) and the enterprise yearly profit (C2). B2 is further divided into yearly enterprises GDP per area (C3) and yearly enterprises production location quotient per area (C4). B3 is the enterprise yearly tax paid to the government in the alternative layer. The weighted value of each alternative layer factor is determined by expert evaluation method in the table 2.

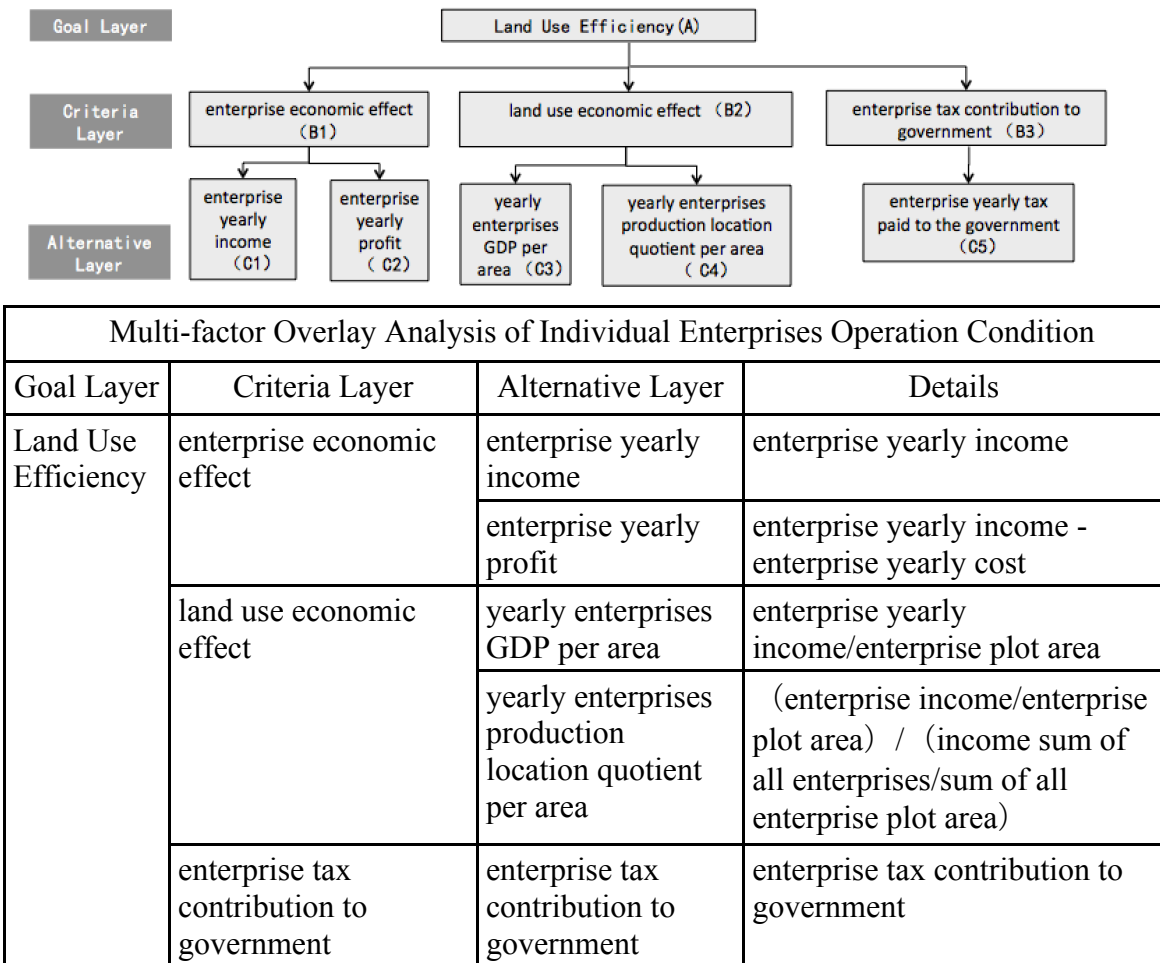| Multi-factor Overlay Analysis of Individual Enterprises Operation Condition			
Goal Layer	Criteria Layer	Alternative Layer	Details
Land Use Efficiency	enterprise economic effect	enterprise yearly income	enterprise yearly income
		enterprise yearly profit	enterprise yearly income - enterprise yearly cost
	land use economic effect	yearly enterprises GDP per area	enterprise yearly income/enterprise plot area
		yearly enterprises production location quotient per area	（enterprise income/enterprise plot area）／（income sum of all enterprises/sum of all enterprise plot area）
	enterprise tax contribution to government	enterprise tax contribution to government	enterprise tax contribution to government

Figure16. Index Selection of Analytic Hierarchy Process (AHP).

Land Use Efficiency Index of Alternative Level	
Alternative Layer	Value Weight
enterprise yearly income	0.198
enterprise yearly profit	0.202
yearly enterprises GDP per area	0.200
yearly enterprises production location quotient per area	0.312
enterprise tax contribution to government	0.088

Table 2. Weighted Value of Each Alternative Layer Factor.

3.2.2 Land Use Efficiency Map

Figure 17 to figure 21 show the amount of the yearly income, yearly profit, yearly tax, yearly GDP per area, yearly production location quotient per area of enterprises of different industry sectors in each village. For the yearly income, the other manufacturing industry ranks first and is mostly centered in Zhangxizhuang village. For the yearly profit, life service sector ranks first and is centered in Shuipo

village and Zhangxizhuang village. For the yearly tax, life service sector and textile manufacturing industry rank highest and are centered in Si village and Zhangxizhuang village. For the yearly GDP per area, the textile manufacturing industry ranks first and other manufacturing industry ranks second, most of which are centered in Zhangxizhuang village. For the yearly production location quotient per area, the other manufacturing industry and textile manufacturing industry are higher than 1 while building industry is the lowest.
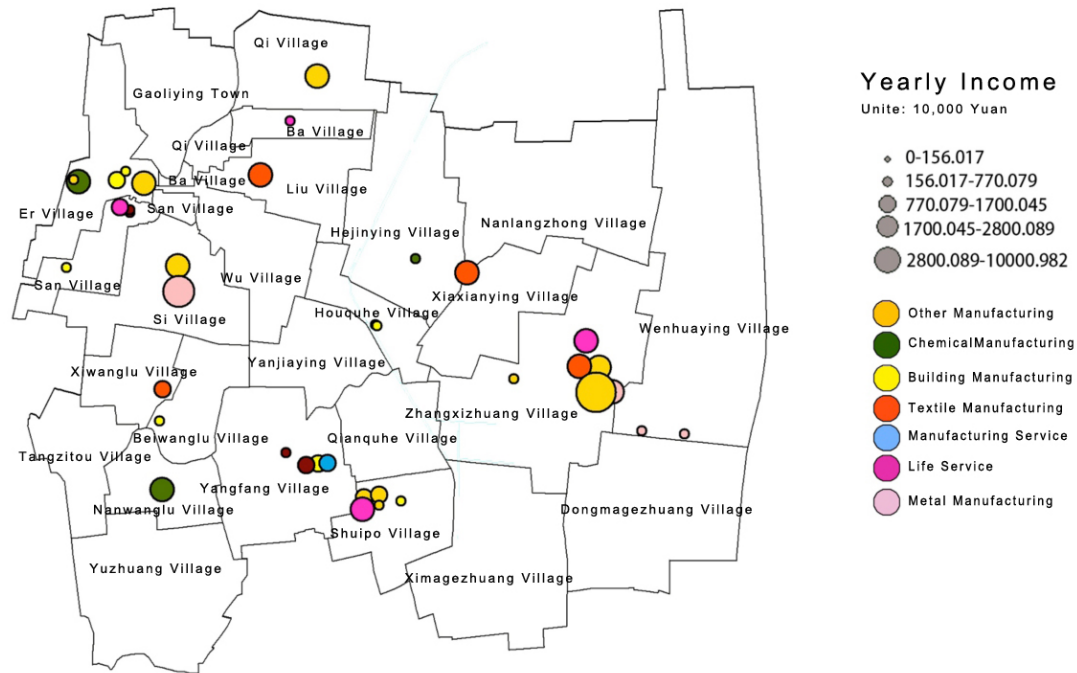

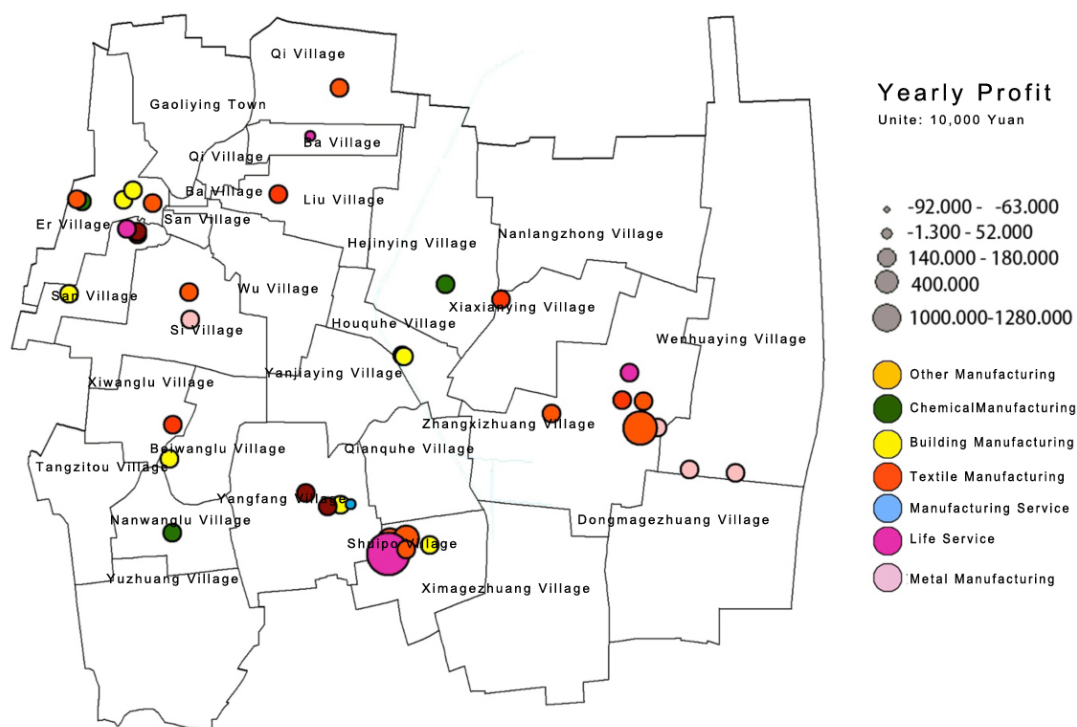**Figure17.** Yearly Income Amount of Different Industry Sectors Enterprises of Gaoliying Town.

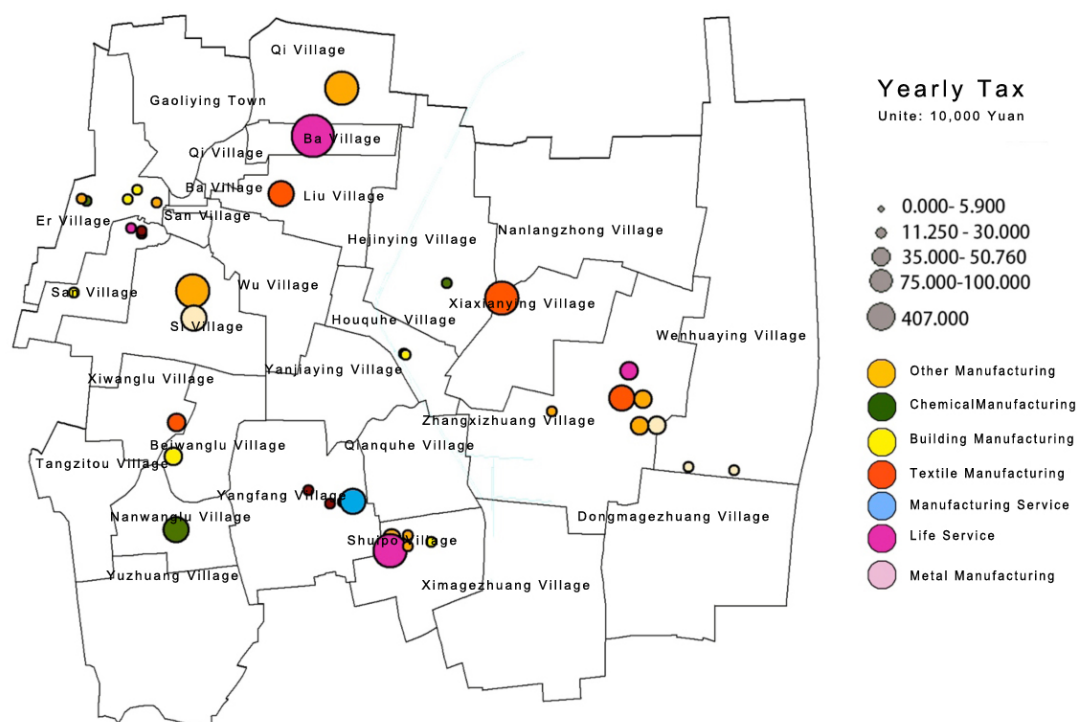**Figure18.** Yearly Profit Amount of Different Industry Sectors Enterprises of Gaoliying Town.

Figure17. Yearly Tax Amount of Different Industry Sectors Enterprises of Gaoliying Town.
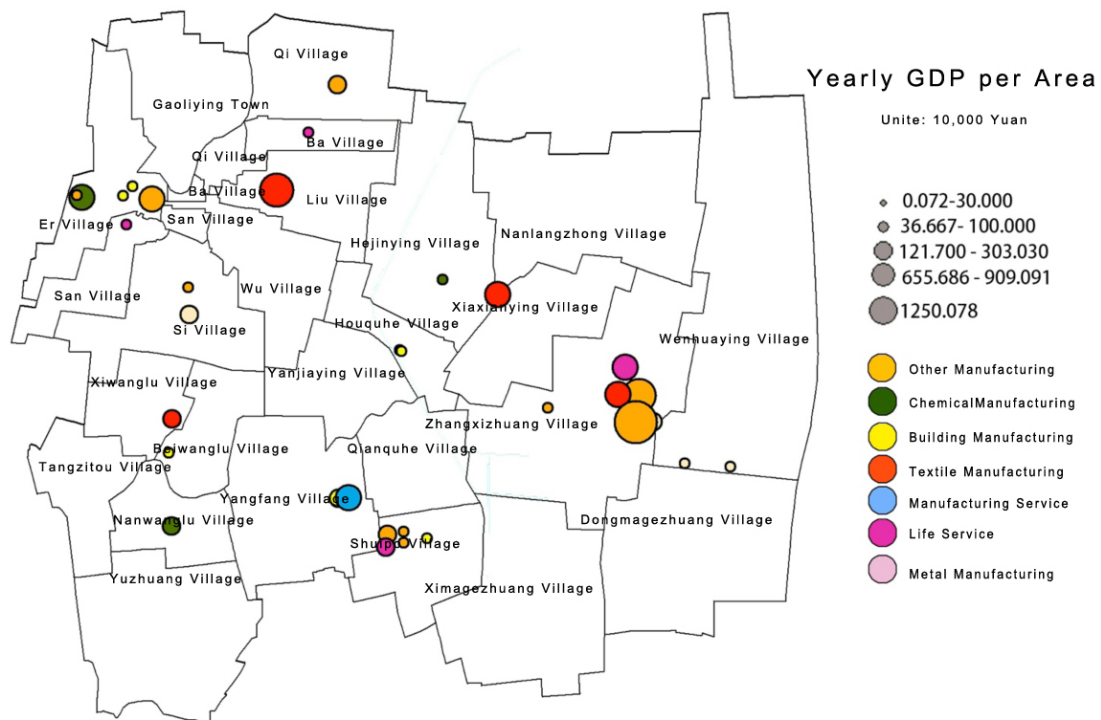
Figure17. Yearly GDP per Area Amount of Different Industry Sectors Enterprises of Gaoliying Town.
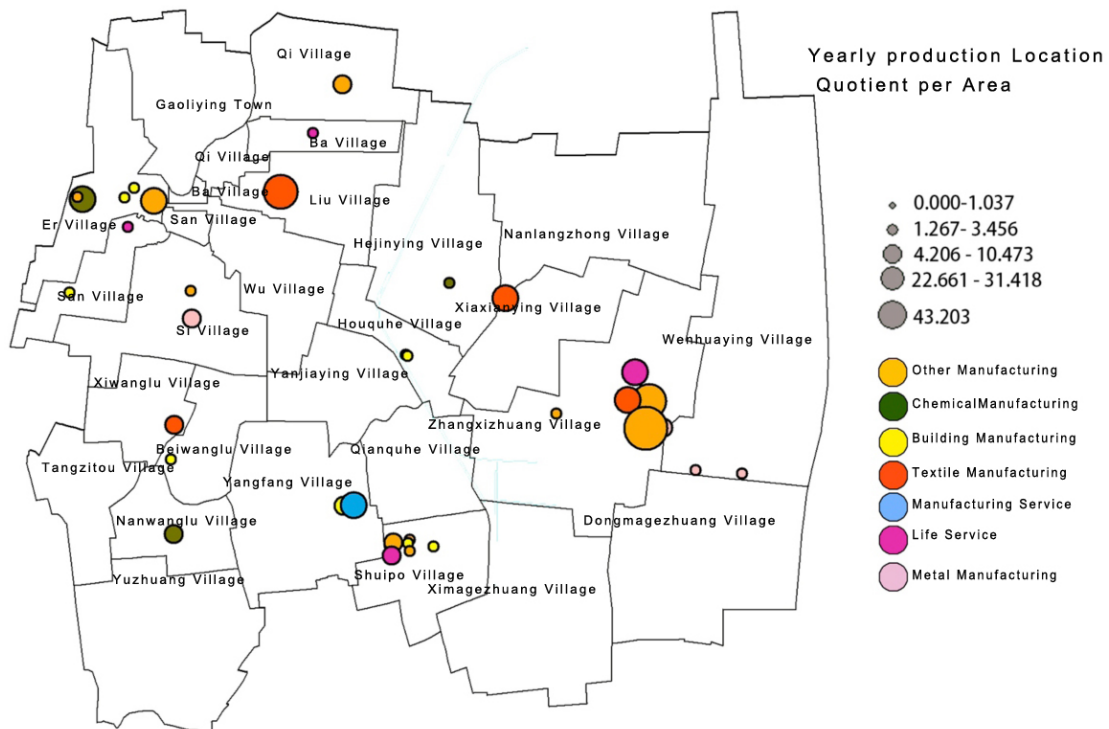
Figure17. Yearly production Location Quotient per Area Amount of Different Industry Sectors Enterprises of Gaoliying Town.

When overlaid in the above PHA model, the goal layer weight map is showed in figure 22. It is clearly illustrated that rubber and plastic manufacturing industry, furniture manufacturing industry are the highest in the goal layer while the wholesale and retail industry is the lowest. The majority of the high land use efficiency enterprises are centralized mostly in Er village for other manufacturing industry and chemical manufacturing industry, in Si village for metal manufacturing industry and

other manufacturing industry, in Shuipo village for life service sector, in Zhangxizhuang village for life service sector, textile manufacturing industry and other manufacturing industry. Further conclusion could be drawn that manufacturing industry enterprises are functioning much better than others in terms of the multi-factor overlay analysis of land use efficiency. Most importantly, the high land use efficiency enterprises have clustered in three major zones: airport economic zone, south downtown center and railway economic zone.
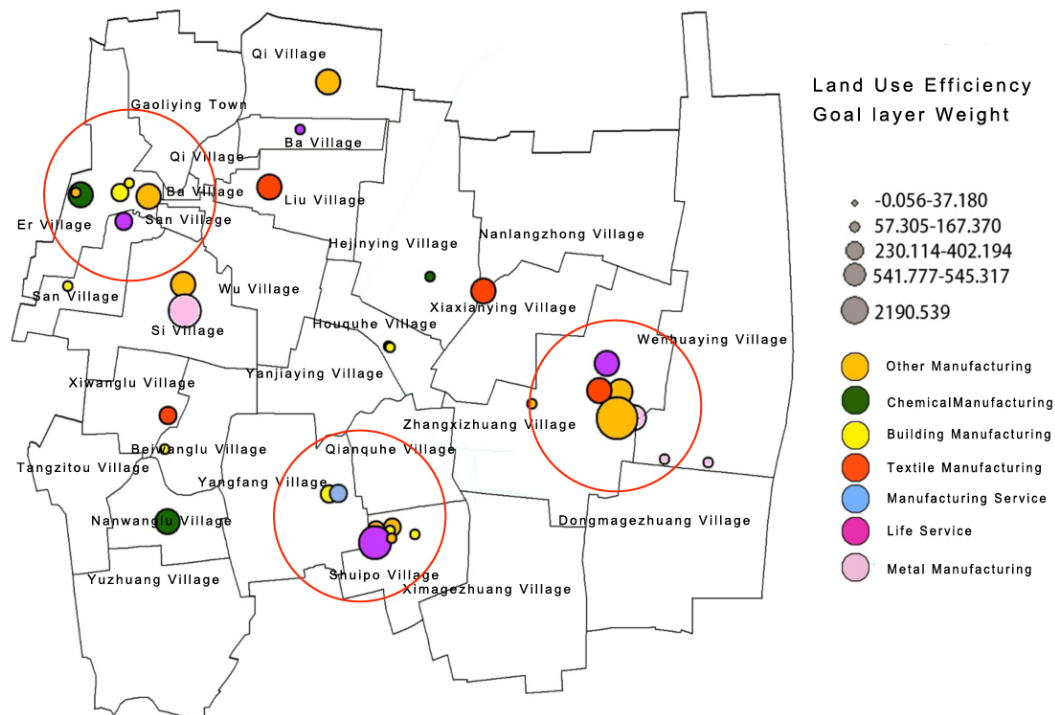
Figure22. Land Use Efficiency Goal layer Weight Map of Enterprises of Gaoliying Town.

3.3 Identification of Low Efficiency Enterprises

In the larger context of Beijing[2], the industry service level index is in slight positive correlation to its revenue rate and significant positive correlation to its value-added rate, indicating that the service level in manufacturing industry is contributive to the improvement of industry production. In addition, the industry production rises by 0.5% when industry service sector rises by 1%, and vice versa. Thus it's important to examine the location quotient of the different industry sector of Gaoliying town to identity the less advantaged sector. According to the table3, the overall industry sector is conspicuously more advantaged, but the manufacturing service is severely disadvantaged with only 0.13 in index and is highly dependent on outside supply. With the slow stimulating of service in industry, the relevant service level improvement and establishment of the industry chain for systematic upgrading is a necessity in the future.

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2 Sun Lei, Zhang Xiaoping. The Spatial Evolution and Center Shifting Analysis of Manufacturing Industry in Beijing [J]. Geographic Science Frontier,2012,04:491-497.

|	Location Quotient	Level
Manufacturing Idustry	3.96	Remarkable Advantage
Building Industry	1.43	Relative Advantage
Manufacturing Service	0.13	Remarkable Disadvantage
Life Service	0.63	Relative Disadvantage

Table 3. Location Quotient of Different Industry Sectors of Gaoliying Town.

When further combining the above land use efficiency map of individual enterprise and the above table of the number and percentage of the low efficiency enterprises of each village, more findings are generated: the reason why Zhangxizhuang village is high in low efficiency enterprise number but low in percentage is that there is also a large number of enterprises with high land use efficiency. Nevertheless, the huge gap between the high and low efficiency enterprises would undermine the efficient centralization of industry cluster in Zhangxizhuang village.

4.Mechanism Analysis

To briefly sum up the existing situation, there has been a trend that three zones for enterprise centralization are being formed: airport economic zone, south downtown center and railway economic zone. However, in the pillar non-farming industry, even the manufacturing industry is with better operation efficiency, the related service sector is still insufficient in stimulating further development. Besides, in some villages where some enterprise cluster has formed, such as Xhangxizhuang village, there is still polarity between the high efficiency and low efficiency enterprises. And a small proportion of high efficiency enterprises are making major contribution to the overall production. Thus the fundamental problem is dispersion of the economic collective construction land use pattern of Gaoliying town and the polarized systematic structure which is highly dependent on outside supplies.

The mechanism is deeply rooted in the social and economic development on the village administration level. Firstly, development stage and location potential vary sharply from village to village. Some villages (Dongmagezhuang village, Zhangxizhuang village, Wenhuaying village, etc.) could gain sustainable profit through the leasing, contracting, joint-stock formats of collective construction land. However, other villages' financial channel is significantly shrinking due to the inferiority in location, natural resources, poor infrastructure and planning policy adjustment. Secondly, momentum for development is insufficient due to the land scarcity. There are only 24 hectares of available land plus 60,000 m2 building area for future development. In the village land use composition of overall 5,000 hectares, farming land takes major 32% and is forbidden by law for construction. Only the rest 937 hectares of poultry cultivation land and 2,652 hectares of collective construction land could be modified for other use, but most of it could not be redeveloped since the enterprises on the land are privately owned. And more importantly, many shutdown enterprises are still occupying collective construction land due to the 20-year long term leasing contract, constituting obstacles to land merging and land use adjustment. Thirdly, even though some regulation and legislation documents have been passed to

legitimize and formalize the real estate management on the collective construction land, they are still lacking sound monitoring in implementation, leading to the waste of village capital and land resources. Some contracts are signed not following the standard rules and the leasing fee contributed to collective assets is low. In addition, some villages are in heavy debt and not financially independent.

5.Case Study of Dongshengxiang Town

Before searching for workable solutions, it is important to refer to other towns for case study. Dongshengxiang town is located at the north fifth ring of Beijing of similar situation in 1980s as Gaoliying town. Before 1990s, its dominant industry was still agriculture. In 1990s, many township enterprises in Beijing began to emerge and develop dispersedly and the collective enterprises were burdened with pressure of employment insufficiency. In 2000, with the urban expansion northwards to the fourth ring, the previous township enterprises were relocated to the outside of the fifth ring to make room of construction land, industrial buildings for redevelopment. In 2005, the urban expansion had crossed the fifth ring. And the Beijing master plan 2004 further facilitated the statutory zoning plan of every piece of construction land in Beijing. In 2009, China State Council proposed to construct the Zhongguan village science and technology park near Dongshengxiang town. With the spillover effect of the science and technology park, Dongshengxiang town caught the chance to attract business and investment to supplement local township enterprises.

The success of Dongshengxiang town could be attributed to the following factors. Firstly, it benefits from favorable position and location close to traffic arteries. This is same to Gaoliying town. Secondly, it is developed in strategic concept. In all villages, the enterprises of basic administrative units take the initiatives. When applying the sustainable development concept, the available collective construction land are sold and used economically to avoid land scarcity. Thirdly, it is run in combination of governmental administration with market to facilitate real estate transaction. In the stock system reform, there have formed ten stock companies and one guiding assets management office in 7 villages. The enterprises must meet certain requirements before entering into the market. And the private property evaluation system has been established to quantify the assets. Fourthly, the collective construction land is in strict management and most of the land is still village owned. Before 1990s, the government gained revenue merely from selling the lands to developers. But now it has shifted into cooperation mode between collective and private sectors based on stock inheritance mechanism, withdraw mechanism and collective property monitoring mechanism. In this scenario, the first-level land ownership of town and second-level land use right of village are clearly defined and reported to upper government, which in turn guaranteens the collective construction land transaction and economic production efficiency.

6.Suggestions

Based on the above analysis, there are three major suggestions for the collective construction land use mode of Gaoliying town.
(1) Improve the assets management to maintain and increase the collective value
The existing assets should be classified for property right and quantified for evaluation. All the assets of different function purpose should be recorded to

guarantee the responsibility of collective property management in terms of value maintain and value increase.

(2) Encourage diverse property and assets management

The proper transaction and optimal regrouping of the collective assets could be achieved through village cooperative share system, contracting and leasing, especially in village community to stimulate the villagers' entrepreneurship spirit.

(3) Increase the sustainability and efficiency of natural resources

For newly developed natural resources, the unified statutory land use management in the form of leasing, contracting and joint-stock is required for economic and sustainable husbandry.

For the long-term contract with low leasing fee, government should intervene in regulating the price for contract fee. For the natural resources already developed by villagers without contract, it could be confiscated for better collective assets development and management.

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