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# Study on Land Use Strategy in Luan County

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**Abstract** On the basis of introducing the status quo of land use in Luan County, the existing problems in the process of land use are analyzed as follows. First, the farmland is the majority, the area of garden land and forests is small and the farmland quality degenerates; second, the scale of construction use land is large, but the intensification level is low; third, reserve resources are scanty and the pressure of protecting farmland mounts. This paper discusses the orientation of Luan County in provincial and municipal land use strategy and geographical conditions of Luan County, analyzes the future development status of Luan County, and proposes that we should take guaranteeing land use strategy realization of Hebei Province and Tangshan City as important condition of land use strategy selection of Luan County. It points out that we should implement land use strategy of Luan County from the following aspects: first, strictly protect farmland, especially the basic farmland; second, focus on economic development and adopt intensive and high-efficiency land use pattern; third, pay equal attention to ecological protection and construction, and adopt many means to improve ecological environment.

**Key words** Eastern Hebei plain, Luan County, Land use strategy, Strategic function area, China

The strategy refers to the arrangement and planning of long-term important problems, related with overall situation<sup>[1]</sup>. Land use strategy refers to the holistic and fundamental arrangement of long-term allocation of land resources within certain region in the future<sup>[2]</sup>, which is the core of land use planning and determines the direction and focus of land use in the whole planning period. Land use strategy longitudinally can be divided into macrocosmic strategy, middle strategy, and microcosmic strategy. The national and provincial strategy is at macrocosmic level, the municipal strategy is at middle level, and county strategy is at macrocosmic level<sup>[3]</sup>. The strategies at different levels have internal correlation and unification. The strategy at superior level determines the selection of strategy at inferior level, while the strategy at inferior level, subject to the strategy at superior level, should be conducive to the realization of the strategy at superior level. Therefore, as for the research of county level land use strategy, we should not only research and analyze some factors in the region, such as geographic conditions, resources, development level, and prospective development strategy, but also research the land use strategy at the level and strategic status of it in the land use at the superior level. After referring to other research results, the suitable land use strategy of this county is determined. Luan County, subordinate to Tangshan City of Hebei Province, is located in eastern Hebei plain with most rapid economic development. This region, with abundant resources and rapid economic development, is in the period of rapid development of industrialization. The biggest open-pit iron mine in Asia sits in Luan County. Luan County is a typical resource-oriented city, and the future contradiction of land supply and demand will be more prominent. This paper takes Luan County as research object, and regards the internal relationship among land use strategies at

different levels as important aspects of formulating strategy. This paper also advances the land use strategy suitable for development of Luan County, which not only develops an insight outlook for research of land use strategy, but also provides meritorious reference for the counties and cities in eastern Hebei Province to formulate land use strategy.

## 1 Overview of the study area

Luan County, 118°14' – 118°49' E, 39°34' – 39°58' N, is located in southern foot of Yanshan Mountain in eastern Hebei Province, and west side of Luan Lake, which has high north and low south topography. The northwest and northeast of Luan County are mountainous regions, the central and southern Luan County have flat topography, and the southwest of Luan County is relatively low-lying. The annual average temperature of many areas in Luan County is 10.5 °C, and annual average precipitation is 640.4 mm. The total area of Luan County is 1 027.67 square kilometers. In 2009 the total population of Luan County is 0.552 6 million, including agricultural population of 458.5 thousand, and non-agricultural population of 90.41 thousand.

## 2 The status quo of land use and analysis of land use problems

**2.1 The status quo of land use** At the end of 2009, the area of agricultural use land is 73 513.42 hm<sup>2</sup>, accounting for 71.5% of total area of land; the second-class agricultural use land includes cultivated land, garden plot, woodland, and other agricultural use land; the area of construction use land is 18 510.07 hm<sup>2</sup>, accounting for 18.0% of total area of land; the second-class construction use land includes urban-rural construction use land, transportation and water conservancy land, and other independent construction use land, wherein the urban-rural construction use land includes land for constructing towns and rural settlements, mining use land, and other inde-

pendent construction use land; the area of other construction use land is 10 746.72 hm<sup>2</sup>, accounting for 10.46% of total area of land; the second-class land includes tidal flat, waters, marsh and natural reserve land.

## 2.2 land use problems

**2.2.1** The farmland is the majority, the area of garden land and forests is small and the farmland quality degenerates.

Luan County, located in the northern Hebei plain, is a big traditional agricultural county, but due to over-exploitation, the area of forest and garden plot decreases rapidly, which makes the coverage rate of forest low, soil erosion critical, biodiversity decrease and ecological environment tend to deteriorate prominently. At the same time, due to improper use of agricultural land, the content of organic matter in soil decreases, the fertility declines, and the output efficiency of farmland lowers.

**2.2.2** The scale of construction use land is large, but the intensification level is low.

With the rapid industrial development in recent years, the construction use land expands rapidly, with large scale. The phenomenon of "empty villages" in rural settlements is serious, and the intensification level of land and land use efficiency is not high; the phenomenon of illegal exploitation is universal, especially focusing on small mineral occurrence and small smelting works; reclamation of mine causes enormous waste of resources, atmospheric pollution and ecological damage.

**2.2.3** Reserve resources are scanty and the pressure of protecting farmland mounts.

Other land only accounts for 10.46% of the total area, which is mainly the tidal flat, marsh and natural reserve land. The natural reserve land is mainly located in northern and western mountainous regions, with thin soil and fertility of soil. Basically, it is the region that is untapped and prohibited to develop, and the land available for development is very limited.

**Table 1** The status quo of land use of Luan County in 2009

First-class land	Second-class land	Area//hm <sup>2</sup>	Proportion//%
Agricultural use land	Farmland	56 853.02	55.32
	Garden land	4 824.96	4.70
	Forest	7 694.76	7.49
	Other agricultural use land	4 140.68	4.03
	Subtotal	73 513.42	71.53
Construction use land	Urban-rural construction use land	17 053.94	16.59
	Transportation and water conservancy use land	1 270.13	1.24
	Other construction use land	183.22	0.18
	Subtotal	18 507.29	18.01
Land for other uses	Waters	1 395.31	1.36
	Tidal flat and marsh	1 355.35	1.32
	Natural reserved land	7 996.06	7.78
	Subtotal	10 746.72	10.46

## 3 Orientation analysis of Luan County in land use of Hebei Province and Tangshan City

**3.1 Orientation of Luan County in land use of Hebei Province** According to *Overall Planning of Land Use in Hebei Province* from 2006 to 2020, its strategy is as follows: take protecting farmland as the prerequisite; take effective control over construction use land as the key; take economical and intensive use of land as the core; coordinate regional land use and urban-rural land use; establish good land use structure and spatial pattern in accordance with the requirements of building resource-saving and environment-friendly society; promote rational use and optimized allocation of land resources; provide guarantee of resources for economic and social development of the province. The orientation of land use in Luan County of Hebei Province is as follows: develop agriculture vigorously; build grain base in eastern Hebei; deepen exploiting potentialities of construction use land; promote use benefit and intensification level of construction use land; give play to advantage of the resources in Luan County so as to be incorporated into the development of Tangshan city group.

**3.2 Orientation of Luan County in land use of Tangshan City** Luan County is an important grain-producing area in Tan-

gshan City. The future land use direction is to strictly control various kinds of farmland for construction use; strengthen management of protection area of basic farmland; stabilize and increase the area of cultivated land; pay attention to grain production and increase yield per unit of grain crops; promote comprehensive and coordinated development of grain, cotton, oil, and vegetables; adjust land use structure; grasp the opportunity of project of planting shelter forests in northeast, north and northwest China and project of returning farmland to forests and grass; strengthen afforestation and reclamation of derelict land and mining area; fully use barren hill, wilderness and sand to conduct afforestation; expand the area of ecological use land; build Luan County as an important ecological barrier area in areas of Beijing and Tianjin.

Simply by the analysis of land use orientation of Luan County conducted by Luan County and Tangshan City, the future land use direction of Luan County is mainly to protect the farmland, develop agriculture, focus on ecological environment construction, compress the size of construction use land and exploit internal potentialities.

## 4 Analysis of geographic conditions

The geographic conditions of Luan County have outstanding advantages, and the transportation of Luan County is con-

venient. Luan County, 200 kilometers away from Beijing, 47 kilometers away from Tangshan, 136 kilometers away from Tianjin Port, 82 kilometers away from Qinhuangdao Port, is in Bohai Economic Sphere and city group of Tangshan and Qinhuangdao. The transportation of Luan County is convenient, and Beijing – Shenyang Railway, Beijing – Shenyang expressway, Pingqing Road, and Qiancao Railway are intertwined. With the initial formation of Bohai economic circle and the acceleration of economic integration of Beijing, Tianjin, and Hebei, whole eastern Hebei has become the bridgehead of undertaking industrial transfer; with the quickened pace of development of Tangshan City and the adjustment of industrial structure, the advantage of geographic conditions will be more prominent.

In order to promote future development of Luan County, it will fully exert its geographical advantages, actively integrate into the city group of Tangshan, undertake industrial transfer, combine the geographical advantage and resources advantage, and create powerful industrial county in eastern Hebei. Therefore, ensuring the industrial use land and urban expansion use land will become the key of important land use strategy.

## 5 Analysis of future development of Luan County

**5.1 Development strategy** Around the development strategy of "two-zone uplift, interlocking of three points, flying with both wings and full rise", it will actively integrate into metropolitan circle of Beijing, Tianjin and Tangshan, and take the initiative to accept the leading of Tangshan City. It will also increase opening up and seek broader space for development by virtue of its own resources, geographical advantages and industrial base. It will strictly protect the natural resources and ecological environment that the human being relies upon to subsist, in order to achieve coordinated and sustainable development of economy, society and environment. By 2020, the population is expected to reach 0.61 million; it will achieve the urbanization rate of 61%, the county GDP will reach 64.1 billion yuan; per capita GDP will reach 0.105 million yuan; the ratio of three industries will reach 8:60:32; the area of construction use land in county will reach 2 896 hm<sup>2</sup>; the coverage rate of forests will reach 40%; the ecological environment will be in favorable circular track; the urban environment will be fundamentally improved.

In the perspective of future development strategy and objective of Luan County to conduct analysis, in order to achieve development objective, Luan County must speed up the industrialization and urbanization, and have adequate land resources to ensure development. In addition, the local government is disposed to choose extension-oriented development in its will, lacking impetus of exploiting internal potentialities of construction use land. Therefore, ensuring industrialization use land and urban development use land is the direction of land use in Luan County, and the key to strategic choice of land use. Ensuring ecological use land is a relatively minor aspect in land use strategy of Luan County.

**5.2 Land use strategy of Luan County** The problems of land use in Luan County are mainly as follows: the quality of

farmland lowers; the coverage rate of forests is low; the ecological environment deteriorates; the scale of construction use land is large; the use efficiency is low. In order to solve these problems, compressing construction use land and ensuring ecological use land are bound to become the primary strategic focus of land use. The strategic orientation of Luan County by Hebei Province and Tangshan City is as follows: protect farmland, vigorously develop agriculture, strengthen ecological construction and control the scale of construction use land. Luan County's geographic advantages and the future development strategy need to ensure industrial development use land and urban expansion use land. These focuses of land use are mutually exclusive, and the future land use cannot meet all the needs of land use. If we do not take into account the orientation of Luan County by land use strategy of province and city, but only consider its own land use problems, resources, geographic conditions and strategic choice of Luan County, then the primary strategic focus of land use is to ensure the urban development use land, industrial development use land and ecological use land. But the choice of such a strategic focus is inconsistent with the orientation of Luan County by land use strategy of province and city, which cannot promote the realization of land use strategy of province and city. It should take the orientation of Luan County by land use strategy of province and city as the primary strategic focus and then it determines other strategic focuses. Finally it formulates land use strategy of Luan County. Luan County's land use strategy is as follows: focus on protecting farmland, vigorously develop agriculture, strengthen ecological construction, strictly control the scale of construction use land, and promote intensive and high-efficiency land use.

**5.2.1 Strictly protect farmland, especially the basic farmland.** Protecting farmland, especially the basic farmland, is the core of future agricultural use land management of Luan County. We should strictly control the farmland that is occupied for construction use, especially the basic farmland; strengthen infrastructure construction; perfect the system of water, roads and shelterbelts; expand the scale of land reclamation and especially transform the middle-and-low-yielding fields; promote advanced growing technology and varieties; promote soil fertility and yield efficiency; implement the farmland protection and compensation system in order to call forth the enthusiasm of farmers in protecting farmland. By 2020, it will achieve no less than 53 530 hm<sup>2</sup> of cultivated land and no less than 46 781 hm<sup>2</sup> of basic farmland.

**5.2.2 Focus on economic development and adopt intensive and high-efficiency land use pattern.** We will focus on economic development, ensure the reasonable supply of land for construction, and improve intensification level and benefit of land use. Luan County is in the rapid development period of industrialization and urbanization, coupled with Luan County's enormous geographic advantages and resources advantages, the contradiction of demand and supply of construction use land will increasingly stand out. We will develop an insight outlook, resolutely shut down small-scale, low-efficiency, great-pollution, and low-tech small enterprises, and eradicate inefficient use of land for construction. By 2020, the area of other independent construction use land and mining use land will decrease to 991.67

and 1 397.25 hm<sup>2</sup> respectively, decreasing by 1 184.97 and 1 417.38 hm<sup>2</sup> as against that in the year 2009; we will strengthen renovation of rural residences, coordinate urban-rural construction and promote rural land use efficiency. By 2020, we will achieve that the scale of rural settlements decreases from 9 961.23 to 7 183 hm<sup>2</sup>; we will speed up the construction of industrial parks, guide enterprises to enter parks, give full play to the scale merit of industrial parks, and promote intensive level and benefit of construction use land; we will speed up the construction of central city and township, conduct scientific planning, strictly control construction scale and prevent inefficient expansion. By 2020, the urban use land will be controlled within 2 858 hm<sup>2</sup>.

**5.2.3** Pay equal attention to ecological protection and construction and adopt many means to improve ecological environment. We will further optimize the land use structure and spatial layout; grasp the opportunity of project of planting shelter forests in northeast, north and northwest China and project of returning farmland to forests and grass; strengthen afforestation and reclamation of derelict land and mining area; fully use barren hill, wilderness and sand to conduct afforestation; expand the area of ecological use land; reclaim the land that is inappropriate to be as farmland and construction use land into garden plot or forests; give priority to protecting vegetation in western



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Province either has favorable advantages, or has unavoidable disadvantages. In the long run, although there are some problems in the process of development of the double-low rapeseed industry in Hubei Province, there are good opportunities, with immense potentials of development. The main strategies we can adopt are as follows: we should implement brand effect strategy, quality management strategy and strategy of deepening industrial system, give full play to existing geographic advantage and other advantages, grasp scarce opportunities and actively confront challenges, and combine the strategy with internal resources and external environment of Hubei Province, so that the double-low rapeseed industry in Hubei Province is further developed.

Luan County, and northern mountainous region; prohibit random exploitation and damage; strengthen the shelterbelt construction and protection along the traffic line and rivers; control the disorderly development of tidal flats; speed up structural adjustment; vigorously introduce high-quality fruit varieties and expand the scale of high-quality fruit trees; speed up construction of high-quality timber and fruit bases; accelerate the pace of industrialization; improve the overall benefit of ecological use land. We will strive to achieve the goal of 40% of forest coverage rate, pay equal attention to ecological protection and construction, adopt many means to improve ecological environment, focus on economic development and adopt intensive and high-efficiency land use pattern, in order to fundamentally improve ecological environment, and achieve harmonious coexistence and synchronized development of city and natural ecosystem.

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