

Strategic Objective and Development Strategies of Urban Modern Agriculture during the 13th Five-Year Plan in Suzhou City

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Abstract. On the basis of stated fully the connotation of urban agriculture and its function, analyzes the reality problem and strategic objectives of the metropolis modern agriculture in Suzhou. The measures, such as the optimizing the spatial form of "four million acres", building modern agriculture industry system, cultivating modern agricultural management main body, promoting modern agricultural material and technical equipment level, and improving the agricultural specialization service level, strengthening agricultural science and technology innovation driving function, strengthening the protection of agricultural ecological environment and improving agricultural leisure tourism were put forward.

Introduction

According to "Urban System Planning in Jiangsu Province (2015-2030)" publicly released, Jiangsu Province will form an urban rating scale system consisting of 2 mega-cities, 15 cities, 12 medium-sized cities, 28 small cities and 540 towns by 2030, and Suzhou is one of the two mega-cities. Future agriculture development of Suzhou should also be defined as urban modern agriculture. This paper, based on investigation and survey, proposes the strategies, strategic objectives and indicator system of urban modern agriculture development in Suzhou City.

Urban Agriculture and Urban Modern Agriculture

In 1930, Japan first used the term of urban agriculture in "Osaka Peasants Bulletins"; in 1950, American scholars used the term of urban agriculture region; in 1977, Allen Nice, American agricultural economist, published "Japanese Agriculture Mode" in which the concept of urban agriculture was formally proposed^[1]. Japanese scholars first proposed in 1935, urban agriculture refers to developed and special agricultural organizations distributed between central urban areas like urban commercial, industrial and residential areas, or distributed outside the cities, and also believed it attached to urban economy and is directly impacted by urban economy^[2].

Modern agriculture is the summary and overlook of current and future agricultural development trends, and its meaning is changing and constantly perfected; and urban agriculture refers to the new agriculture of the city or near the city^[3]. Urban modern agriculture is the organic combination of the two concepts, the extension of urban agriculture as well as the refinement of modern agriculture^[4]. Since the early 1990s, China has begun to introduce the Japanese concept of urban agriculture to conduct extensive research^[2]. Agricultural economists believe urban agriculture is highly-scale, industrialized, technicalized and marketized agriculture^[5]. In 1995, Shanghai Municipal Government initially proposed the conception of establishing "urban modern agriculture", and what is established in current stage is also "urban modern agriculture", not simply "urban agriculture"^[2].

Practical Problems in Urban Modern Agriculture Development in Suzhou

Urban modern agriculture is a new product of agricultural development in the process of integration of urban and rural construction and urbanization, which is active adaption and transition of agriculture to urban development. In recent years, the process of urbanization of Suzhou speeds up, the promotion of urban-rural integration is rapid, and the area of agricultural land substantially declines. According to statistics, the area of agricultural land in Suzhou decreased from 374,293 hectares in 1980 to 208,000 hectares in 2015, and will decrease to 205,333 hectares by 2020^[6,7].

Modern agriculture development in Suzhou is facing numerous practical problems, such as prominent problem of scarce resources, increasingly serious shortage of agricultural labor, increasing environment pressure, quality safety of agricultural products to be improved, disconnection between production and need and low professional service level, which are relatively similar to the problems of Tokyo, Shanghai, Beijing and other large cities before the development of urban modern agriculture.

Strategic Objectives of Urban Modern Agriculture Development in Suzhou

The strategic objectives are accelerating the transformation of agricultural development mode, realizing the mechanization, scientization, industrialization, informatization and ecologicalization of agricultural production, building national modern agriculture demonstration zone, first developing a modern development road of urban agriculture of safe product quality, good ecological environment, efficient land productivity and agriculture civilization inheritance with Suzhou characteristics, leading national urban modern agriculture, first achieving the “synchronization of industrialization, informatization, urbanization and agricultural modernization” in Jiangsu Province, first realizing agricultural modernization in Jiangsu Province as well as in China, first being in line with average developed countries, and promoting the development of modern agriculture to a new level.

Table 1. Recommendation index system of urban modern agriculture development in Suzhou city

Primary Index	Secondary Index	Unit of Index
Agricultural Output Efficiency	1. Added Value of Agriculture, Forestry, Animal Husbandry, and Fishery	100 million yuan
	2. Area Proportion of High-efficiency Facility Agriculture (Fishery)	%
	3. Per Capita Net Income of Farmer	yuan
	4. Output of Recreational Agriculture	100 million yuan
Agricultural Science and Technology Progress	1. Contribution Rate of Agricultural Science and Technology Progress	%
	2. Occupational Farmers Accounted for the Proportion of Agricultural Labor Force	%
	3. Public Service System Improvement Rate of Township or Regional Agriculture	%
	4. Households Internet Rate of Village	%
Industrial Management of Agriculture	1. Moderate Scale Operation Proportion of Agriculture, Animal Husbandry and Fishery	%
	2. Ratio of Agricultural Products Processing Production and Total Agricultural Output Value	times
	3. Comprehensive Agricultural Mechanization Level	%
Agro-ecological Environment Protection	1. Proportion of Ecological Circular Agriculture	%
	2. Forest Coverage Rate of the Land	%
	3. Proportion of Agro-ecological Compensation	%
Ratio of Urban and Rural Integration	1. High-quality Rice Area	hectare
	Wherein, the Proportion of High-standard Farmland Area	%
	2. High-efficiency Gardening Area	hectare
	Wherein, Perennial Vegetable Field Area	hectare
	3. Special Aquatic Product Area	hectare
Wherein, Standardized Fishpond Area	hectare	
4. Ecological Forest Area	hectare	
Wherein Area of Wetland Above City Level	hectare	
5. Urban-rural Income Gap	times	

Based on “Basic Modernization Index System of Jiangsu Agriculture (Trial)” issued by Jiangsu Provincial People’s Government and the actual situation of modern agriculture development in Suzhou City, the index system of urban modern agriculture development in Suzhou City is established, as is shown in Table 1.

Countermeasures of Urban Modern Agriculture Development in Suzhou

Optimizing Agricultural Space Form

Formulate long-term protection and development measures of agriculture, and moderate scale industrial area accounts for 90% of total arable land.

On the macro planning, scientifically determine priority village and characteristic village, define permanent protection farmland, make the characteristics of idyllic scenery and Jiangnan Watertown more distinctive, and form spatial layout of concentration and moderate scale. On the scale of development, promote the scale and character development of various forms, and effectively avoid the fragmentation and popularization constraining modern agricultural development. On the construction of connotation, speed up the construction and upgrading work of modern agricultural park, give full play to its resources, technology and talent accumulation effect, expand the connotation of agricultural park development, and form an open modern agricultural park with supporting infrastructure facilities, full functions, complete elements, gathered technology and cooperation. On the spatial layout, the overall layout is divided into several regions, the regional layout is hierarchical, the county layout has some gardens, the industrial layout is in large scale, functional layout is characteristic, and modern agricultural park is arranged across towns, villages and various regions, to fully explore agricultural products with local characteristics, and to form brand effect.

Constructing Modern Agricultural Industrial System

Fully exploit the endowments and comparative advantages of resources of each region, actively promote the optimization and adjustment of agricultural structure, and strive to build modern agricultural industrial system dominated by high-quality rice, special aquatic products, efficient gardening, ecological forest and large-scale livestock (Figure 1).

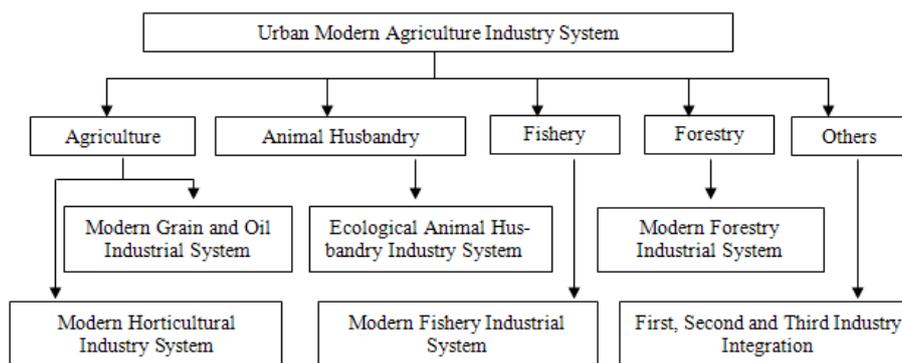


Figure 1. Development framework of urban modern agriculture industry system in Suzhou.

Stably develop grain production like high-quality rice production, build a modern grain and oil industrial system, build a number of high-quality grain and oil production bases of full mechanization and stable yields despite drought or excessive rain. Stably promote the quality and efficiency of horticultural crops, build a modern gardening industrial system, and improve the mechanization level of horticultural production, to form a group of influential horticultural industry clusters.

Strive to develop ecological animal husbandry, construct ecological animal husbandry industrial system, and guide and promote animal husbandry ecological health aquaculture models like the

combination of agriculture and animal husbandry, the combination of planting and breeding and fermentation bed breeding. Overall raise the modernization level of fishery, build a modern fishery industrial system, vigorously promote the construction of modern fishing park, and comprehensively promote the ecological healthy breeding mode of aquatic products.

Actively promote the sustainable development of forestry, construct modern forestry ecological system, and change from coverage increment to structural improvement. Vigorously promote the development of the first, second and third industry integration, extend agricultural industry chain, enhance agricultural value chain, expand multifunctional agriculture, and foster new forms of agriculture.

Cultivating Operating Entities of Modern Agriculture

Strengthen policy guidance, improve incentive mechanism, vigorously cultivate and develop new agricultural operating entities like agricultural parks, cooperative farms, family farms, specialized cooperatives and agricultural enterprises, increase the training efforts on new professional farmers, and improve the large scale, professionalization and modernization level of agricultural production and operation (Figure 2).

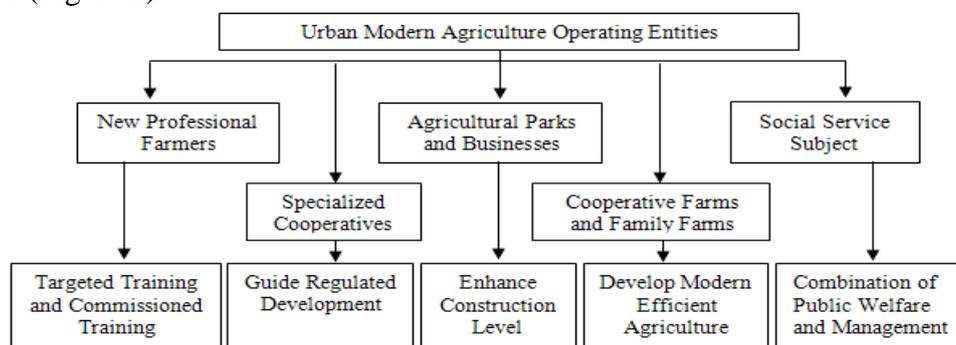


Figure 2. Cultivating architecture of urban modern agriculture operating entities in Suzhou.

Accelerate the development of new professional farmers, vigorously carry out the targeted training project and commissioned training project of young professional farmers, and accelerate the development of new educated, skilled professional farmers team with reasonable age structure, clear professional structure, leading practical skills as well as good management. Guide the standard development of specialized cooperatives, foster a number of specialized cooperatives with large operating scale, strong service capabilities, superior product quality and good democratic management, and establish unified production and operation rules.

Enhance the construction level of agricultural parks and businesses, strengthen the ability of stimulating agricultural modernization development of agricultural parks and businesses, and promote the sustainable development of modern agricultural parks and businesses. Encourage the development of cooperative farms and family farms, develop modern high-efficiency agriculture, and realize specialized production, scale operation and intensive development. Accelerate the development of new social service subject, and build agricultural social service system with the combination of public service and management service, the coordination of professional service and integrated service.

Enhancing the Equipped Level of Modern Agricultural Material Technology

Further promote high-standard farmland construction, and speed up the reform and improvement of agricultural infrastructure. Set high-standard farmland construction planning and implementing programs, integrate various project resources like agricultural resources development, agricultural industrial park, boundless fertile land, high-standard farmland and water conservancy projects, increase investment in infrastructure, and gradually build contiguous and concentrated high-standard farmland, as is shown in Figure 3.

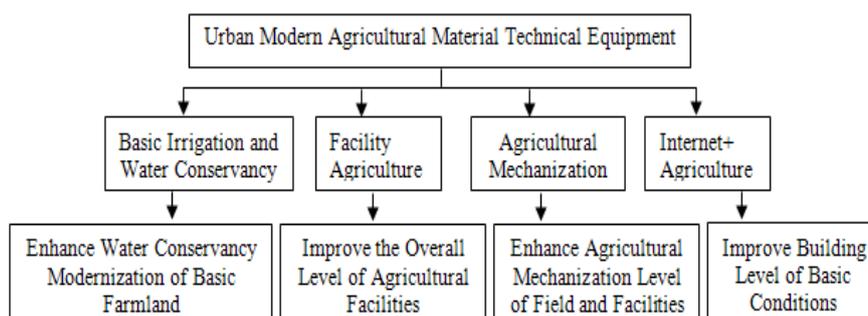


Figure 3. Architecture of urban modern agricultural material technical equipment level in Suzhou.

Promoting Professional Service Level of Agriculture

Professional service of agriculture in Suzhou has already had good development foundation, and agricultural production areas and key towns basically achieve full coverage of professional services in agriculture. However, the professional service level is not enough, the ability is not strong, the structural system of agricultural professional service is not perfect, the professional standard of agricultural professional service should be improved, and the condition construction of social professional service organization needs to be strengthened, as is shown in Figure 4.

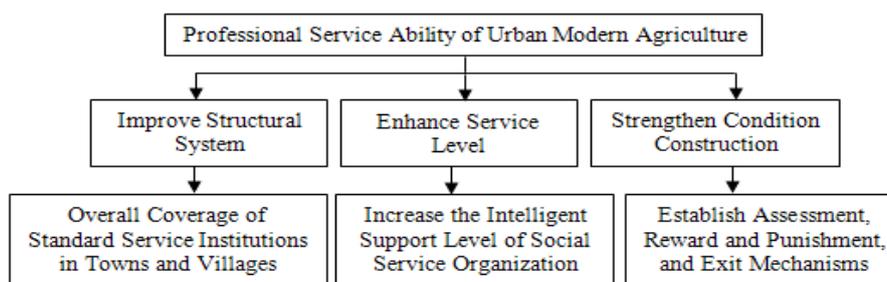


Figure 4. Professional service capability framework of urban modern agriculture in Suzhou.

Strengthening the Driving Effect of Agricultural Science and Technology Innovation

For promoting modern agriculture construction of Suzhou to a new level and first achieving agricultural modernization, vigorously implement the strategies of developing and strengthening agriculture through science and education, and focus on constructing new agricultural technology innovation and agricultural extension service system fitting the urban modern agriculture development in Suzhou. Strengthen the agricultural scientific and technological tackling, innovation and integration, and conduct effective collaborative research, technology integration and industry-university-research cooperation, by focusing on agricultural high-tech and key generic technologies of industry like quality safety of agricultural products, ecological environmental protection and food production.

Strengthen the training of leading talents in agricultural science and technology, further clarify intellectual property rights and innovation transformation mechanism, and explore and improve the incentive and distribution system of scientific research interests.

Strengthening Ecological Environment Protection of Agriculture

Insist on ecological priority strategy, highlight the concepts of green development, cycle development and low-carbon development, and accelerate the formation of a new pattern of urban modern agricultural development with the harmonious development of man and nature.

Strengthen the protection of agricultural resources, and improve the scientific and technological innovation competitiveness of the agricultural germplasm resources. Strengthen agricultural non-point source pollution control, vigorously develop planting and breeding pattern of ecological cycle, and realize the “overall coordination and cyclic regeneration” among various agricultural

industries. Implement four cultivated land quality protection projects, namely, enhancement and protection of soil fertility, ecological restoration of soil heavy metal pollution, survey, monitoring and evaluation of the quality of arable land, and topsoil stripping and utilization of farmland.

Promote the livestock manure processing center mode, the three-dimensional-one-purification mode of large-scale breeding farm, and the combination of agriculture and animal husbandry stereo mode, to control the contamination of livestock manure. Promote rural sewage ecological treatment project with low cost, effective treatment, and easy maintenance.

Strengthening Agricultural Sightseeing Tourism

Actively develop ecological leisure tourism of agriculture, explore rural ecological leisure, tourism, cultural and educational values, foster a number of characteristic agricultural landscape tourism towns and villages, sightseeing agricultural attractions, charming villages, create a number of agricultural leisure tourist routes, and promote integrative development of agriculture and tourism. Construct new leisure agriculture industry alliance, and create characteristic advantaged industrial belts and clusters of modern leisure agriculture with standardized production, intensive management, standardized services and diversified functions, to be famous agricultural leisure resorts in the Yangtze River Delta region.

Conclusion

Urban modern agriculture is the new agricultural product given birth by urban and rural integrated development in Suzhou, and also the new requirement proposed by mega-city construction of Suzhou for future agriculture development.

Urban modern agriculture development in Suzhou has a good foundation, and we should focus on optimizing agricultural spatial form, accelerate the construction of urban modern agricultural industrial system, strive to foster new agricultural operating entities focusing on young professional farmers, overall raise the material equipment level and specialized social service level, and give full play to the application of modern technology in the construction of urban modern agriculture, which will definitely help build the urban modern agriculture with the characteristics of Suzhou, and provide a distinctive case for urban modern agriculture construction in China.

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