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Exploring the Sustainability of Urban Leisure Agriculture in Shanghai

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Abstract: Leisure agriculture is an essential part of urban agriculture in Shanghai. However, sustainable development for urban leisure agriculture has reached a critical point. In this paper, we attempted to analyze the sustainability status of 22 urban leisure farms in Shanghai using the IDEA (Indicateurs de Durabilité des Exploitations Agricoles) method for sustainability indicators. From this analysis, we found out that farms' average sustainability scores were 25.72 on the agroecological scale, 32.5 on the socioterritorial scale, and 46.5 on the economic scale. This proved that urban leisure agriculture in Shanghai has high sustainability at the economic scale, followed by the socioterritorial scale and the agroecological scale. However, the overall sustainability of urban leisure agriculture in Shanghai was low, which indicates that Shanghai's urban agriculture still needs to be strengthened for sustainability. Thus, this paper concludes with some policy recommendations for the future development of urban leisure agriculture in Shanghai.

Keywords: urban agriculture; leisure agriculture; agriculture sustainability; sustainability indicators

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1. Introduction

Leisure agriculture, an emerging agricultural model, has grown rapidly in China over the past decade, and it has become popular in metropolitan areas. Leisure agriculture is a new type of urban multifunctional agriculture that relies on the natural environment, the natural landscape, farming culture, and tourism. It is operated in a practical way to meet consumers' various needs, such as getting close to nature, relaxing, and experiencing farming practices.

Currently, there is no unified definition of leisure agriculture in academia; it is referred to as agrotourism, farm tourism, farm stay, and agriculture experiences by scholars. Che et al. [1] defined it as an active engagement in agricultural production, management, planting, farming, gardening, and rural life; it is a form of modern agriculture that combines entertainment, education, and personal experience in agricultural work. In addition, McGehee et al. [2] defined it as "rural enterprises that incorporate both a working farm environment and a commercial tourism component". In Guo's article "Significance, Trends and Prospects for the Development of Leisure Agriculture in China" [3], Guo states, "Leisure agriculture is a new type of industry based on the development of the first industry and the tertiary industry. It is a successful combination of agriculture and tourism in which agriculture is the basis, leisure is the aim, service is the means, and urban tourists are the consumers".

Regarding the past discussions in academia about the purpose of developing leisure agriculture, Sharpley [4] pointed out that the status of traditional agriculture has been declining; however, the development of leisure agriculture effectively increases employment opportunities and income. Noel [5], who shares the same view, believes that tourism in France could be seen as the primary way to employ the rural labor force. Walmsley [6]

believes that leisure agriculture connects urban and rural areas and promotes the development of tourism industries in both urban and rural areas. As a new and modern form of agriculture, leisure agriculture is inherently multifunctional. Shi [7] summarized the functions of leisure agriculture as follows: (1) recreation function, (2) educational function, (3) social function, (4) economic function, (5) environmental protection function, (6) medical function, and (7) cultural heritage function. Given the diversity and versatility of leisure agriculture, there is not a single way to classify it by location, function, theme, or other factors. Scholars have classified leisure farms according to different classification methods and criteria in the literature, and the results are summarized in Table 1.

Table 1. Classification of leisure agriculture.

Basis of Classification	Category	Source
Leisure theme	Leisure farms, leisure forestry farms, leisure pastures, rural cultural activities, sightseeing farms, citizens' farms, educational farms, and rural homestays	Shi [7]
Functions of leisure tourism	Ornamental type, tasting type, shopping type, farming type, entertainment agriculture, healing type, and vacation type	Hu [8]
Connotation	Resource-based and culture-based	Hu [8]
Geographical distribution model	Nature-based and urban-based	Hu [8]
Development type	General agriculture type, farming type, high-tech demonstration farm, and farmhouse type	Li [9]

Along with the rapid development of leisure agriculture, the sustainable development of leisure agriculture has generated increasing concern. The idea of sustainable development was first systemically articulated by United States environmental analyst Brown [10]. The shape of a sustainable society—a sustainable transportation system, agriculture resurgence, new industries and jobs, urbanization, greater local self-reliance, and simpler lifestyles—was examined. The means of transitioning to this sustainable society and the institutional challenges accompanying it were discussed. Later, in 1987, the World Commission on Environment and Development defined sustainable development in *Our Common Future* as development that meets the needs of present generations without compromising the ability of future generations to meet their own needs. It contains two key concepts: the concept of "needs" (in particular, the essential needs of the world's poor, to which overriding priority should be given) and the concept of "limitations", which are imposed by technology and social organizations on the environment's ability to meet present and future needs.

Francis [11] pointed out that sustainable farming is based on three essential functions: producing goods and services, managing the landscape, and playing a role in the rural world. These functions are included in the definition of a sustainable farm given by Landais [12]: "(A) sustainable farm is a farm that is viable, livable, transferable, and reproducible". In addition, sustainable urban agriculture can address the issue of urban food security. [13–15]. In a previous study, Svensson and Wood [16] framed the business sustainability goal as the triple bottom line (TBL) with economic, environmental, and social aspects for sustainable development. Later, Svensson et al. [17] proved that the economic element of the TBL directly affects the environmental element, with the social element mediating this effect. The results reported here offer long-needed empirical insights into the interplay between the TBL elements, which have important research and practice implications.

The motivation of this study came from the fact that few previous studies have focused on the sustainability of leisure agriculture in Shanghai, especially in quantitative analysis. As one of China's largest cities, Shanghai has a large market and demand for urban leisure agriculture. Against the backdrop of an increasingly high standard of living, a growing number of people are interested in urban leisure agriculture in Shanghai. In this context, the

sustainable development of urban leisure agriculture in Shanghai is certainly representative of the situation.

2. Materials and Methods

Sustainability is an essential factor for ensuring agricultural development [18]. To study the development status of urban leisure agriculture in Shanghai, it is essential to understand its degree of sustainability. Assessing the sustainability degree in quantitative terms has been attempted in various ways and from different angles, predominantly environmental, social, and economic angles. Measuring sustainability in the field of agriculture has been a topic of interest, and Wang et al. [19] gave it his approval. Sustainability indicators, as a tool to quantify the sustainability of agriculture, are widely used in research in related fields. From the various sustainable indicators, IDEA (Indicateurs de Durabilite des Exploitations Agricoles), an intuitive and user-friendly sustainability indicator framework, was chosen in this study to analyze the sustainability of urban leisure farms in Shanghai.

2.1. Description of the Study Area

Shanghai is located in eastern China, between the 120°52′–122°12′ east longitude and 30°40′–31°53′ north latitude, at the mouth of the Yangtze River (Figure 1). Shanghai has a subtropical monsoon climate with four distinct seasons, an average annual temperature of 15 °C, and average annual precipitation of 1083 mm. It is part of the Yangtze River Delta alluvial plain, which is low-lying and fertile and very conducive to agricultural cultivation. The natural conditions for agriculture have laid a solid foundation for the development of agriculture in Shanghai. Simultaneously, as a modern metropolis with a resident population of 24,183,300, Shanghai has the largest consumer market in the country, which has greatly contributed to the development of urban agriculture in Shanghai.

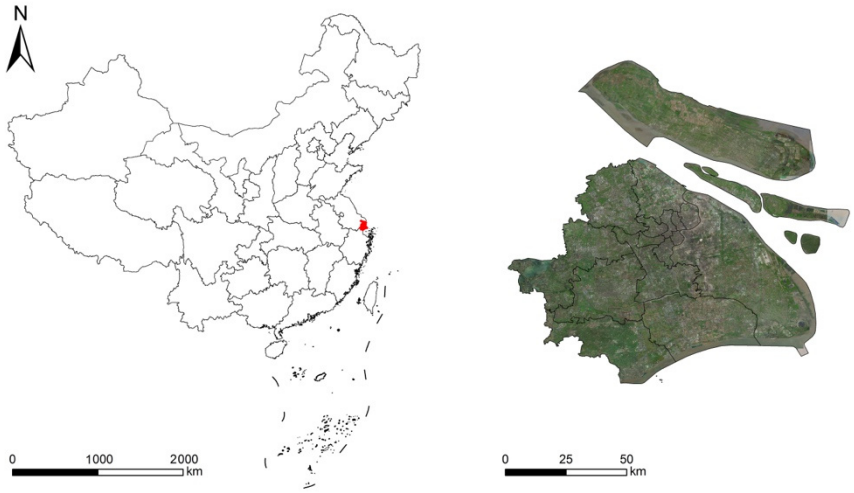

Figure 1. Study area.

It is now widely believed that Shanghai's leisure agriculture originated in the early 1990s. Since then, Shanghai's leisure agriculture has developed rapidly. The Third Shanghai Agricultural Census showed that by the end of 2015, Shanghai had approximately 323 leisure farms (Figure 2). The revenue from urban leisure agriculture in Shanghai has also grown year after year, from CNY 702 million in 2010 to CNY 1.899 billion in 2015, accounting for 6.6% of the total agricultural output for the same period (CNY 28.784 billion in 2015).

Figure 2. Number of leisure farms in Shanghai [20]. Available online:www.stats.gov.cn (accessed on 22 March 2022).

2.2. Data Collection

A survey was conducted on ninety-seven urban leisure farms in Shanghai, and addresses and phone numbers were collected from public information available on the *Dianping* website (www.dianping.com) (accessed on 1 June 2020). Ninety-three questionnaires were mailed and emailed after excluding four farms that were no longer in business. Twenty-two valid questionnaires were returned, for a return rate of 23.6%. The questionnaires were collected between September and December 2020.

The questionnaire consisted of 26 single- and multiple-choice questions as well as fill-in-the-blank questions. The main purpose of the questionnaire was to investigate the current sustainable development status of Shanghai urban leisure farms and the operators' perceptions of Shanghai urban leisure agriculture.

2.3. Data Analysis

To evaluate the sustainability of urban agriculture in Shanghai, the IDEA (Indicateurs de Durabilité des Exploitations Agricoles) method was selected to analyze the sustainability of leisure farms in Shanghai. IDEA is a research method developed by agroeconomist researchers at INRA (National Institute for Agricultural Research, France) [21–23]. The indicator system in the IDEA method was the primary tool for farm diagnoses. This system evaluates the sustainability of a farm and was developed with two objectives in mind. The first objective is to be an educational and transparent tool to practically teach the concepts of agricultural sustainability and farm sustainability to students. The second objective is to be a monitoring or decision support tool not only for farmers but also for advisors to support a transition toward more sustainable agriculture [24]. Compared with other agricultural sustainability measurement tools, the IDEA sustainability indicator provides a comprehensive measure of farm sustainability in a short amount of time, and it is easy for respondents, including those with no basic knowledge of sustainability practices, to use [25].

We measured the sustainability of leisure farms in Shanghai through the IDEA methodology using the following steps. First, we tested and confirmed the original indicators. In consideration of the varying conditions in different regions, minimal amendments were made to the original methodology, such as reviewing the grading scale and the nature of

the information collected or modifying specific parameters to better fit the methodology to specific features [26].

Then, a conceptual model based on objectives grouped into 3 scales, 10 components, and 41 indicators was confirmed (Tables 2–4). A matrix was then built to check whether all the objectives were represented in a balanced manner by the indicators. In this matrix, the weights of the indicators were mostly set according to the original IDEA system [21], while those that were adjusted and localized were determined after several rounds of expert discussions.

Next, a questionnaire based on all the indicators from IDEA system was designed and sent to the survey respondents. Most of the questions on this questionnaire corresponded directly to all the indicators in the matrix. After the questionnaires were returned, the scores of each leisure farm were calculated one by one by using the previously determined indicator weights and related calculation methods. These scores were divided into three main scales, Agroecological, Socioterritorial, and Economic, and ten components. Each of these main scales had a full point of 100. The main calculation rule was that the higher the score (between 0 and 100), the more sustainable the farm was. Finally, by combining the scores at each scale, we obtained the sustainability of each leisure farm in all aspects and compared them across farms, and by deriving an average score, we determined the sustainability of leisure agriculture in Shanghai.

It is worth noting that since all IDEA indicators are from a joint assessment of the various components of agricultural sustainability, according to the original design of this system, each point represents a basic unit of sustainability [21]. Scores for each of the three scales are given equal weight, as the same indicator tends to reflect sustainability on multiple scales. Therefore, in this study, the sustainability importance was equal for each of the three scales.

Table 2. Indicators in the agroecological sustainability scale.

Indicators	Calculations		Points	Weight
A1 Crop diversity	More than one crop per hectare		2	0–8
	Legumes cover more than 10% of cultivated land		3	
	Horticultural plants greater than 60% of the total arable area		3	
A2 Diversity of perennial crops	Share of permanent grassland	Less than 3%	0	0–10
		3–10%	2	
		11–25%	4	
		26–35%	6	
		Over 35%	8	
	Arboriculture/viticulture and other perennial crops, by species present		2	
A3 Associated plant diversity	Presence of more than 3 species of plants		3	0–3
A4 Animal species diversity	Presence of more than 3 species of animals		3	0–6
	Over 3 types of dairy cows		3	
A5 Valorization and conservation of genetic heritage	Presence of heritage		3	0–6
A6 Crop rotation	Mixed cropping on more than ten percent of the arable land		2	0–10
	Proportion of land in crop rotation to total arable land	Less than 20%	8	
		20–25%	7	
		26–30%	6	
		31–35%	5	
		36–40%	4	
A7 Plot size	Plot size	Less than 5 ha	2	0–6
		5–10 ha	4	
		Over 10 ha	6	

Table 2. *Cont.*

Indicators	Calculations		Points	Weight
A8 Organic farming	Percentage of land under organic cultivation	Less than 10%	0	0–5
		10–20%	2	
		Over 20%	3	
	Growing legumes for fertilization	2		
A9 Ecological regulation zone	Nonmechanizable mountainous areas	2		0–4
	Fishponds	2		
A10 Actions to support natural heritage	Have a natural heritage	2		0–2
A11 Loading animal	Number of animals per unit area	Less than 0.2/ha	0	0–3
		0.2–0.5/ha	1	
		0.5–1.4/ha	3	
		1.4–1.8/ha	2	
		Over 1.8/ha	0	
A12 Forage area management	Forage area over 30% of the total area	3	0–3	
A13 Chemical fertilizer use	Percentage of chemical fertilizer use	0–30%	3	0–3
		31–60%	1	
		61–100%	0	
	Using soilless culture	3		
A14 Effluent treatment	Use effluent treatment units	3		0–3
A15 Pesticide use	Proportion of nonorganic pesticides used	0	10	0–10
		1–10%	9	
		11–20%	8	
		21–30%	7	
		31–40%	6	
		41–50%	5	
		51–60%	4	
		61–70%	3	
		71–80%	2	
		81–90%	1	
		91–100%	0	
A16 Anima welfare	Adopting animal welfare protection		2	0–2
A17 Protecting soil resources	The proportion of idle land to total arable land in winter	100%	5	0–5
		81–100%	4	
		61–80%	3	
		41–60%	2	
		21–40%	1	
		0–20%	0	
A18 Irrigation	No irrigation	3		1–3
	Using the water reservoirs	1		
	Using the water meters	1		
A19 Energy dependency	Electricity consumption per hectare of arable land	Less than 600 kWh	8	−1–8
		600–900 kWh	5	
		900–1200 kWh	3	
		1200–1500 kWh	1	
		1500–1800 kWh	0	
		Over 1800kWh	−1	

Table 3. Indicators in the socioterritorial sustainability scale.

Indicators	Calculations		Points	Weight
B1 Quality of specific products	Certificate of origin area		5	0–11
	Featured products		3	
	Organic certification		3	
B2 Protection of the built heritage and landscape	Protect the built heritage and landscape		3	0–3
B3 Treatment of nonorganic wastes	Special treatment for nonorganic waste		3	0–3
B4 Accessibility in the area	Location	Inner Ring	6	0–6
		Middle Ring	3	
		Outer Ring	0	
B5 Social involvement	Working with local communities		2	0–4
	Prescribing directly to customers		2	
B6 Direct selling	Direct sales to customers		3	0–6
	Process own produce		3	
B7 Pluriactivity	Rental of arable land to customers		2	0–8
	Holding agricultural tourism projects		2	
	Process and sell fertilizer		2	
	Producing renewable energy		2	
B8 Contribution to job creation	Created more than five new jobs in the last five years		3	0-9
	Percentage of employees under 35 years old	Over 50%	3	
		26–50%	2	
		1–25%	1	
		0	0	
	Percentage of female employees	Over 50%	3	
		26–50%	2	
		1–25%	1	
		0	0	
B9 Collective work	Collective use of agricultural equipment and services		2	0–4
	Farm is part of a producer group/ processing and sales cooperative		2	
B10 Probable perenniality of farm	Almost sure existence in 10 years		6	0–6
	Probable existence in 10 years		4	
	Desirable and possible existence in 10 years		2	
	Probable dismissal in 10 years		0	
B11 Dependency on feed market	Import ratio = "imported" area/total arable land area	Less than 10%	10	0–10
		11–20%	8	
		21–30%	6	
		31–40%	4	
		41–50%	2	
		Over 50%	0	
B12 Establishment	Length of establishment	Over 5 years	2	0–2
		1–5 years	1	
		Less than 1 year	0	
B13 Work intensity	Weekly working hours	0–20 hours	3	0–3
		20–40 hours	2	
		40–60 hours	1	
		Over 80 hours	0	
B14 Life quality	Hourly wage = income/working hours	Over CNY 44	5	0–5
		CNY 22–44	3	
		Less than CNY 22	0	
B15 Isolation	Farm is not isolated from the outside		7	0–7
B16 Reception, health, and safety	The farm is equipped with emergency rescue equipment		7	0–7

Table 4. Indicators in the economic sustainability scale.

Indicators	Calculations		Points	Weight
C1 Economic viability	Economic efficiency = (earnings—loan interest)/no paid workers	Over CNY 40,000	20	0–20
		CNY 30,001–40,000	15	
		CNY 20,001–30,000	10	
		CNY 10,001–20,000	5	
		Less than CNY 10,000	0	
C2 Economic specialization	Share of income generated by the main farm activity in total turnover	0–25%	10	0–10
		26–50%	6	
		51–75%	3	
		76–100%	0	
C3 Financial dependency	Σ (Reimbursed debt + paid interest in year "N")/gross farm surplus in year "N"	Less than 20%	15	0–15
		20–25%	12	
		26–30%	9	
		31–35%	6	
		36–40%	3	
		Over 40%	0	
C4 Subsidies sensitivity	Σ Direct subsidies/gross farm surplus	Less than 20%	10	0–10
		20–40%	8	
		41–60%	6	
		61–80%	4	
		81–100%	2	
		Over 100%	0	
C5 Economic transmissibility	Fixed capital + working capital/nonpaid workers	Less than CNY 600,000	20	0–20
		CNY 600,000 to 3,000,000	10	
		Over CNY 3,000,000	0	
C6 Efficiency	(Total income − intermediate consumption)/total income × 100%	10–20%	3	0–25
		21–30%	6	
		31–40%	9	
		41–50%	12	
		51–60%	15	
		61–70%	18	
		71–80%	21	
		81–90%	24	
		Over 90%	25	

3. Results

After we used the IDEA method to analyze twenty-two urban leisure farms in Shanghai, we derived average sustainability points and distribution scores for them. The average score of these farms was 104.72. The score on the agroecological sustainability scale was 25.72, that on the socioterritorial sustainability scale was 32.5, and that on the economic sustainability scale was 46.5 (Figure 3).

Furthermore, according to the distribution of scores (Figure 4), these urban leisure farms performed better on average on the economic sustainability scale, especially for economic efficiency and financial independence. However, in comparison to these two points, the economic transmissibility and economic viability performances, which are also in the economic area, for these farms were weaker. This contrast may be due to the "total assets" nature of the leisure farms and a lack of risk tolerance due to a single source of income. The high score for financial independence was also possibly due to the general lack of subsidized support for urban leisure farms in Shanghai and the low availability of loans from banks.

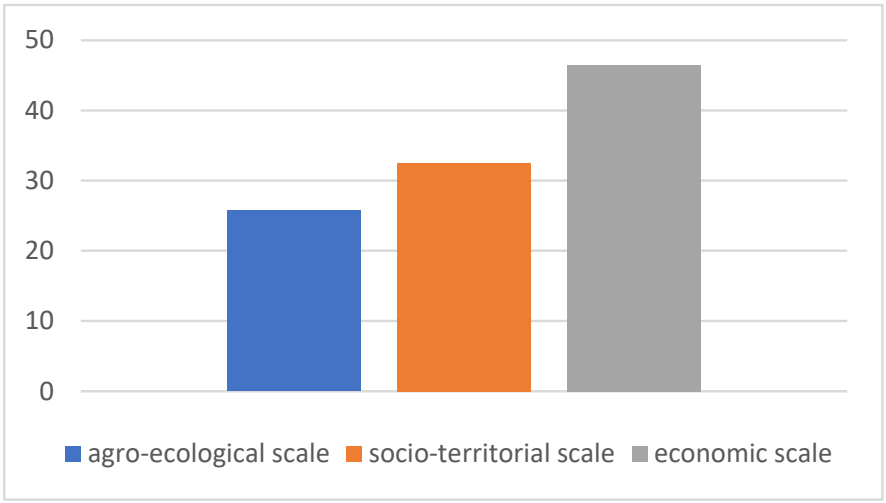

Figure 3. Average sustainability score for Shanghai urban leisure farms on three scales.

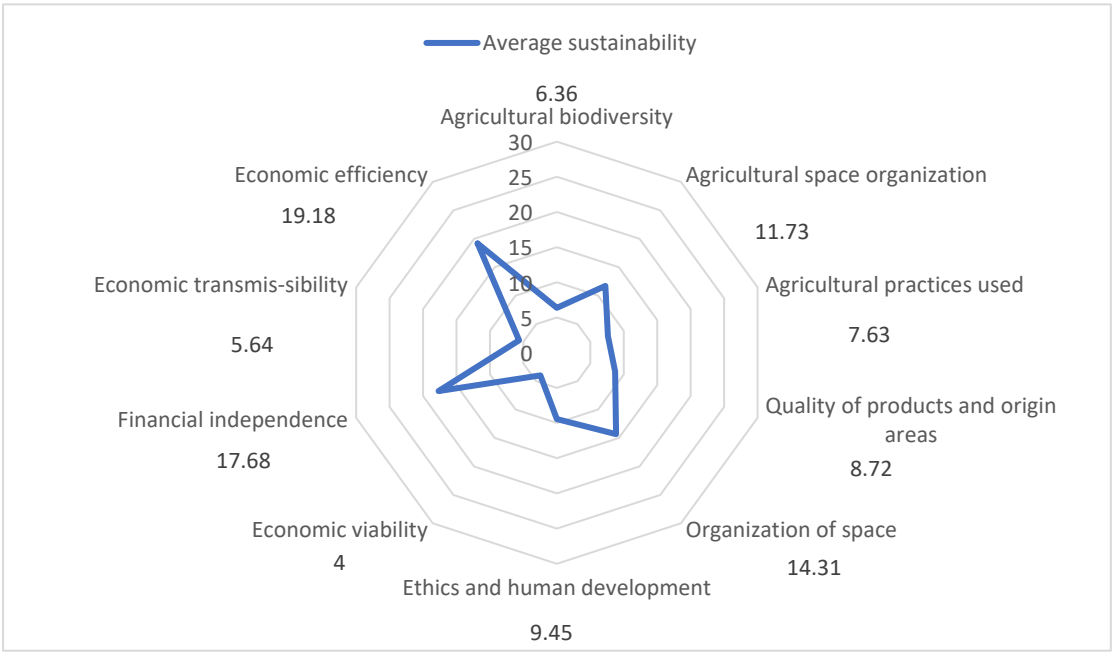

Figure 4. Average sustainability score distribution of Shanghai urban leisure farms by ten components.

Moreover, these farms performed better in both agricultural space organization and organization of space. This is likely because leisure farms tend to have organic farming practices, and urban leisure farms in Shanghai create many jobs.

Regarding the total score distribution for each leisure farm (Figure 5), we saw that among all the leisure farms, the one with the highest sustainability score received 172 points, the one with the lowest sustainability score received only 46 points, and only two farms received more than 150 points out of 300 points. The sustainability of urban leisure agriculture in Shanghai, as measured by the IDEA method, was 104.72/300 points. Compared with previous related studies performed in other regions using the IDEA method [27,28], the sustainability of urban leisure agriculture in Shanghai is significantly lower. In M'hamdi et al.'s study [27], smallholder beef cattle farms in the north of Tunisia had an average sustainability score of 146.9/300 points. Similarly, in Salas-Reyes et al.'s [28] study on 10 dual-purpose cattle farms in a subtropical area of central Mexico, the average

sustainability score was 219/300 points. Although this may be related to the geographical distribution of farms and their different operational characteristics, it is undeniable that the sustainability of urban leisure agriculture in Shanghai needs to be improved.

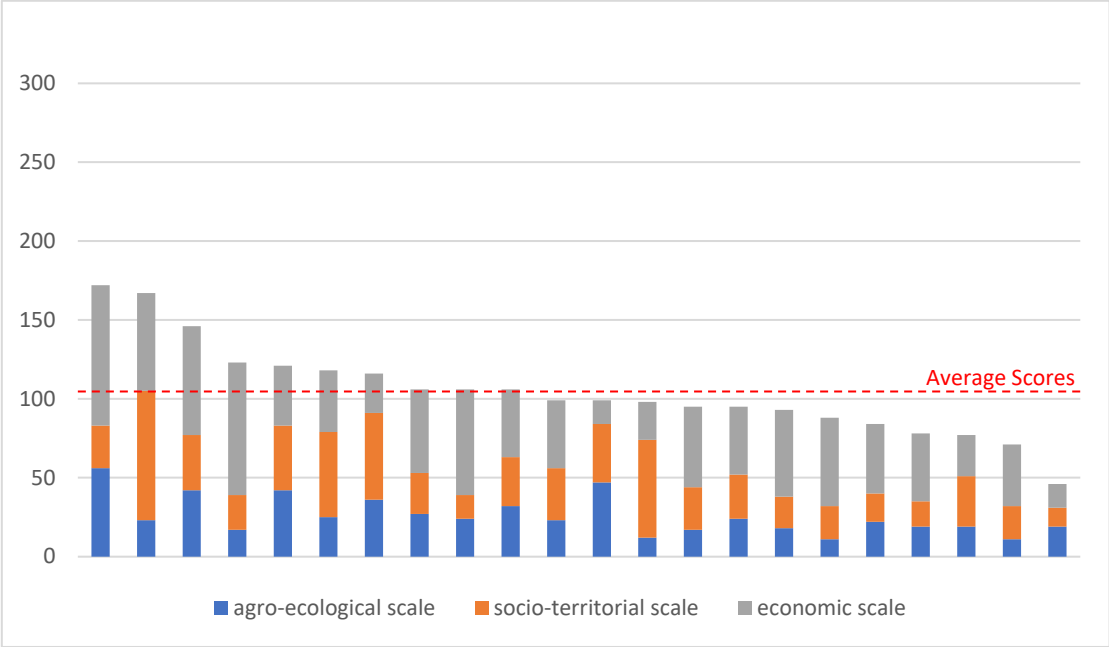

Figure 5. Shanghai urban leisure farm total score distribution.

4. Discussion

4.1. Status of Sustainability of Urban Leisure Agriculture in Shanghai

In general, Shanghai urban leisure farms demonstrated a high degree of sustainability on the economic scale, especially in terms of economic efficiency and financial independence. In contrast, the performance of urban leisure farms in Shanghai was weak on the agroecological scale. The higher economic sustainability of urban leisure agriculture in Shanghai may be due to the city's relatively good economic base. In a previous study on urban leisure agriculture in Shanghai, Chen [29] stated that in 2019, Shanghai's GDP per capita exceeded USD 20,000 based on the resident population, reaching the level of upper-middle developed countries. International knowledge of tourism development indicates that when the GDP per capita reaches the middle-income stage, the demand for leisure grows. When GDP per capita enters the high-income stage, standards for the level and quality of leisure become higher. The high level of economic and social development in Shanghai will inevitably lead to an increase in the frequency of leisure trips and the pursuit of a return to nature, health, and environmental protection. The high consumption enthusiasm in Shanghai residents ensures solid financial independence for the city's urban leisure agriculture sector. At the same time, the high score was also possibly due to the general lack of subsidized support for urban leisure farms in Shanghai and the low availability of loans from banks.

At the socioterritorial scale, the weaker performance of urban leisure agriculture in Shanghai may result from the distribution of urban leisure farms, which, according to a previous study, are mainly located in the city's middle and far suburbs, basically beyond the "one-hour travel circle" of citizens. Starting from People's Square, the core area of Shanghai, leisure farms within 40–60 km distance account for 40% of all the leisure farms in Shanghai, followed by those within 60–80 and 20–40 km distance circles. The number of leisure farms within 20 km of the city center and beyond 80 km is declining precipitously [30]. This distribution is mainly caused by the high land prices in downtown Shanghai and the special

land ownership system, which also makes Shanghai's urban leisure farms less connected to the communities in the city and less likely to provide support for community residents.

The exact reason for the lack of biodiversity in Shanghai's urban leisure agriculture is that land-use restrictions limit the choice of crop cultivation and animal breeding species for leisure farms. The higher operating costs and lower prices of agricultural products in Shanghai make leisure farms often cautious about using organic farming. These factors made Shanghai's urban leisure agriculture score the weakest on the agroecological scale.

From Figure 5, we can see the distribution of sustainability scores and the average scores of urban leisure farms in Shanghai. The average sustainability score of urban leisure farms in Shanghai was 104.72 out of 300 points. Referring to past studies that have used IDEA sustainability indicators [27,28], we see that the sustainability of urban leisure agriculture in Shanghai is at a low level. This result indicates that the current sustainability status of urban leisure agriculture in Shanghai is problematic, and the sustainability of the relevant leisure farms needs to be strengthened.

4.2. Future Development and Policy Suggestions

The following are some suggestions to address the lack of sustainability currently facing Shanghai's urban leisure agriculture development.

First, in terms of economics, operators of urban leisure agriculture in Shanghai tend to be mainly small-scale farms. Urban leisure farms, as represented by a series of high-tech and organic farms, tend to have higher operating costs and more significant financial pressure, and all lack financial support from banks. In addition, for historical reasons, the nature of the land and ownership relationships of urban leisure farms are complex, which makes it more difficult for operators to apply for subsidies. In this regard, the government should improve relevant support policies and provide certain subsidies according to urban leisure agriculture's social and environmental benefits and unique characteristics. The government should also clarify land ownership and property rights for urban leisure farms in relevant legislation and consider their circumstances when formulating subsidy policies.

Second, policies should encourage biodiversity in Shanghai's urban leisure farms and encourage operators to adopt organic farming practices. An effective evaluation system should be developed to measure the environmental externalities of urban leisure farms, and the results should be used as a basis for subsidizing urban leisure farming and promoting a focus on the environmental sustainability of farms.

Finally, it is also essential to strengthen the cooperation between the local communities and educational institutions and the urban leisure farms in Shanghai so that leisure farms can be fully utilized to spread agricultural knowledge and create social value, making agricultural education and agricultural experience a real part of the daily life of Shanghai citizens.

Moreover, existing weaknesses and potential threats to Shanghai urban leisure agriculture should be confronted by integrating existing Shanghai urban leisure agriculture; strengthening cooperation between the government, enterprises, industry associations, and individual small-scale operators; creating brand effects; and expanding market channels and the brand influence of urban leisure agriculture in Shanghai, while ensuring market demand remains the primary objective. Simultaneously, the unique product characteristics of Shanghai's urban leisure agriculture and its differentiated operations can also help protect it from potential competition and threats.

5. Conclusions

Shanghai's urban leisure agriculture has grown rapidly over the past 20 years. The number of leisure farms and their associated income increases by the day due to the city's excellent natural environment and vast market demand. However, against this backdrop, urban leisure agriculture's sustainability in Shanghai is still slightly lacking and needs to be strengthened.

From an IDEA analysis of 22 urban leisure farms in Shanghai, we conclude that at all three scales, urban leisure agriculture in Shanghai has relatively high sustainability at the economic scale, followed by the socioterritorial scale and the agroecological scale. This is due to the high financial independence and economic efficiency of urban leisure farms in Shanghai. In addition, we can see from the overall sustainability score that Shanghai's urban leisure agriculture still has low sustainability in general and still needs to make more improvements to achieve sustainable development.

To achieve the goal of sustainable development of urban leisure agriculture in Shanghai, the Shanghai government and related departments should strengthen funding for leisure farms and encourage them to adopt organic farming and enhance farm biodiversity. Leisure farms should strengthen their cooperation with the community and contribute to community development. They should also cooperate with government enterprises and industry unions to meet market demand as their primary goal, while expanding their brand influence to the greatest extent possible.

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