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RESEARCH ARTICLE

Parasitic Behavior and Separation Countermeasures in Large-scale Farming: Insights from Shijiazhuang, China

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Abstract: A significant number of young and middle-aged farmers are migrating to urban areas, which could facilitate farmland transfer and large-scale farming in China. While there has been active exploration in achieving large-scale farming, a replacement model has not yet been developed. The primary challenge does not stem from the modes themselves, but rather from agricultural stakeholders' parasitic behavior on farmland transfer. This parasitism takes the form of farmers' continued reliance on farmland, village cadres leveraging their power for rent-seeking from farmland, and the virtual parasitism carried out by agricultural intermediaries. Drawing from an investigation conducted in Shijiazhuang, the capital city of Hebei in the North China Plain, this study asserts that the key to promoting orderly farmland transfer lies in establishing a compensation standard founded on principles of social justice. The article culminates in the exploration of the specific compensation standards for farmland transfer.

Keywords: Large-scale farming; Shortage of agricultural labor; Urban-rural income; Agricultural parasitism; Farmland transfer; Compensation standard

1. Introduction

The main driving force of large-scale agricultural production is the improvement of productivity, which expands farmers' living and production radius. To analyze the driving force of agricultural production, different scholars give different answers from different perspectives. With the rapid development of urbanization and industrialization, many rural workers quit the farms and

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migrate to cities, which leads to a shortage of agricultural productivity [1] and promotes farmland transfer and large-scale production [2,3]. Modern agricultural technologies such as mechanization [4], informatization [5], chemical fertilizers and pesticides have improved agricultural production efficiency [6], saved a lot of labor force, and promoted the scale of agricultural production, which promotes the development of urbanization, industrialization and tertiary industry [7]. Some scholars believe that the scale of agricultural production can effectively save the input of agricultural production factors and resources, protect the soil, improve soil organicity and fertility, reduce carbon emissions [8], and be beneficial to the protection of climate and environment [4,9]. As a low-profit industry, agricultural production's low social recognition makes it universal for the breakage of farmers' inter-generational inheritance [10], especially in smallholder production areas [9]. This is a huge challenge for small-scale farming in China. China is also actively exploring ways to solve the dilemma of small-scale farming and large-scale farming suitable for China to improve food security and increase farmers' income [1].

Since the founding of New China, China has seen two major agricultural reforms. The first one is based on the People's Commune in the early days. Since productivity does not match advanced production relations, it is a failure. The second one is the household contract responsibility system—small-scale farming in the late 1970s. It is based on the unit of households, which achieves great success. In 1984, China's food production increased by more than 100 million tons over 1979 but decreased in 1985. And there is no improvement for the following four years in succession. So during this period, large-scale farming was proposed again.

In January 1983, the Central Committee of the Communist Party of China issued "Problems in Current Rural Economic Policy", which encouraged the gradual concentration of land for cultivation experts. In November 1993, the Third Plenary Session of the 14th Central Committee of the Communist Party of China adopted "the Decision of the CPC Central Committee on Certain Issues Concerning the Establishment of a Socialist Market Economy System", which clearly suggested forms of moderate large-scale farming, such as subcontracting and taking shares. In the early 1990s, Pingdu City, Shandong Province, experimented with the "two-field system". With this system, the cultivated land is divided into two categories: One is the ration land, which is shared by everyone to meet basic life security. The other category is contracted land. With this category, the land, except for the ration field, will be retrieved, planned and contracted to improve the agricultural income. This approach was widespread in developed coastal areas, but was soon halted by the Party Central Committee. Zhejiang Jiaxing's two-point and two-way model is based on the "two-field system" [11], but it has not been fully popularized. The "transfer of development rights" program in China—the Chongqing Land Quotas Trading program, might effectively address the farmland preservation and urbanization dilemma [12]. But it still hasn't been able to replicate in the rest of the country.

In the 21st century, farmland transfer and large-scale farming were actively explored in China [13,14]. Both of them have achieved some achievements, but so far reproducible and popularized mode has not been available. It has been focused on exploring reproducible farmland transfer and large-scale farming [9,15]. In fact, the main bottleneck of China's large-scale farming has been explained: With executive order instead of market mechanism, it is hard to ensure that large-scale farming can be carried out with objective conditions and farmers' wishes. If village cadres try to gain personal benefits from it, large-scale farming will eventually go astray [16]. "Executive Order instead of Market Mechanism" and "Village Cadres' Receiving Benefits" are essentially parasites of "rent-seeking with power" and "squeezing profit from agriculture". Agriculture is low-profit [17,18], therefore, when promoting farmland transfer and large-scale farming, parasitism of "squeezing profit from agriculture" can become the last straw that breaks agricultural reform. So it is of significance for this paper to objectively and fairly analyse the parasitism of squeezing profit from agriculture, and explore the stripping method, which is the most important factor in promoting farmland transfer and large-scale farming in China.

Based on the analysis above, we predict that China will experience an increase in farmland transfer and large-scale farming due to the significant migration of labor forces and students to urban areas. However, since 2018, there has been a decline in the scale of farmland transfer, and in some cases, a reverse flow of farmland. To understand this phenomenon, we conducted a survey and identified that parasitic behavior among agricultural stakeholders is impeding the progress of farmland transfer. Through theoretical exploration and on-site investigations, we propose that the key to addressing this issue lies in the establishment of a compensation standard for farmland transfer that upholds principles of social justice. Furthermore, we advocate for government intervention in creating a platform that disseminates relevant information to facilitate the organized transfer of agricultural land. Building on these findings, our research delves deeper into this topic.

2. Promotion of Large-scale Farming Resulted by Lack of Agricultural Labor Force in China

In rural regions internationally, populations are ageing more rapidly than in urban centres [19]. This phenomenon is also beginning to emerge in China. With the development of the social economy and the improvement of agricultural productivity, a large number of rural surplus labors have been swarming into various industries, which forms a large number of "migrant workers". From 1984 to 1988, rural surplus labors mainly flowed to local town enterprises, with "leaving home without leaving the hometown" as its characteristic. In 1986, the Chinese government began to allow state-owned enterprises to recruit rural labour, which stimulated farmers' migration to cities. At the end of the same year (1986), there were 4.8 million registered farmers in the city, and 15 million with estimated unregistered ones. With the rapid development of the economy in the southeast coastal areas of China, 1989 saw the first "migrant workers tide", and the number reached about 30 million. In 1992, Deng Xiaoping's talks during his Southern Tour played a key role in promoting China's economy, which changed farmers' migration into the new characteristic of "leaving home and hometown". In 1997, the number of migrant workers reached 100 million. Since the 21st century, there has been a growing number of migrant farmers [20]. In 2018, there were about 288 million migrant workers, an increase of 1.84 million over the previous year, and the annual growth rate fell to less than 1% for the first time, an increase of 0.6%. In 2020, there were about 286 million migrant workers, a decrease of 1.8% over the previous year, but also accounts for 20.25% of the total population [21]. A large number of farmers migrating to towns promotes urbanization, as well as farmland transfer and large-scale agricultural production [22].

The dominant factor of farmland transfer and large-scale agricultural production is migrating workers, while the breakage of farmers' intergenerational inheritance is the hidden factor [23]. In 2020, the proportion of students attending primary schools in rural areas accounted for 22.85 percent of the total number of students enrolled in primary schools in the whole country, while the proportion of students attending primary schools for rural left-behind children accounted for 34.68 percent of the students attending primary schools in rural areas [24]. After deducting left-behind children in rural areas, the proportion of students enrolled in primary schools in rural areas accounted for only 14.88% of the total number of students enrolled in primary schools. According to the logic of "father-son succession", which means left-behind children in rural areas will migrate to towns, it could be inferred that children born from 2007 to 2013 will have an urbanization rate of at least 85.12%. A large number of farmers, especially young and middle-aged, migrate to cities to work, and accordingly their children go to towns for education, which will accelerate the reduction of the number of farmers. Besides, there is the breakage of farmers' intergenerational inheritance, and there is little possibility that young and middle-aged adults will come back to agriculture [25]. Therefore, mechanization of agriculture and large-scale production will be promoted by the shortage of agricultural labor and farmland circulation has become an urgent issue for Chinese governments. Young and middle-aged rural workers migrate to cities and towns. Rural children have gone to school in towns. These are farmland transfer and large-scale farming driving forces in China.

According to the statistics of the National Bureau of Statistics of China, the area of farmland transferred under contract in 2004 was 58 million acres, and increased to 280 million acres in 2012, with an average annual increase of 21.6%. In 2016, the area of contracted land was 480 million acres, an increase of 200 million acres compared with 2012, with an annual increase of 14.6%. In 2018, the total area of farmland transferred under contract was over 530 million acres, an increase of 50 million acres compared with 2016, with an annual increase of 5.1%. The total area of cultivated land scaling (over 50 acres in southern provinces and over 100 acres in northern provinces) accounted for 28.6% of the total cultivated land area [26]. According to the data, the area of the contracted land transfer is increasing, but the increasing rate is decreasing. One reason for this is the decrease of speed of migrating into cities, the other important reason is the obstacles in farmland transfer. Related groups expect to get profit from farmland transfer, which results in serious parasitism of "squeezing profit from agriculture" [27,28]. Therefore, it should be recognized that agricultural operators are stimulated by agricultural scaling [29,30], it should also be recognized that agricultural scaling is pushed by a lack of farmers. The first factor to promote large-scale production is to make a scientific and reasonable farmland transfer plan, and the core of which focuses on getting rid of parasitism of squeezing profit from agriculture. Scientific judgment of parasitism and the countermeasures are the key to promoting orderly farmland transfer and forming stable, reasonable and moderate large-scale farming.

3. The Parasitism of Farmland Transfer in Large-scale Farming

According to the principle of distribution according to work in China, labors engaging in agricultural production could obtain agricultural income. However, some

could also obtain income without participation, and this is regarded as parasitic behavior. Farmers, without participating in farming, transfer their land and obtain dividends, which is a parasitism of dependence on agriculture. Rural cadres' embezzlement of collective assets, corroding agricultural economy and hindering agricultural development, is a kind of power seeking agricultural parasitism with involution caused by unsound management of the rural grassroots [31]. Intermediary institutions like agricultural cooperatives and trusts, born with large-scale farming, obtain the price difference by repackaging and leasing it after retrieving the farmland, and maintaining management by intercepting agricultural financial subsidies [32]. The three major parasites can be displayed in Figure 1.

Based on the investigation of the Shijiazhuang areas, the capital city of Hebei in North China Plain, data analysis and logical reasoning, the three major kinds of parasitism are analyzed as follows.

3.1 Parasitism of Farmers' Dependence on Farmland Transfer

The main reason for farmers' dependence on parasitic can be attributed to two aspects. The first is the urban-rural income gap. The second is the block land price.

In China, the wealth accumulation of peasants is significantly lower than that of urban areas. When farmers migrate to cities, or their children migrate to cities, the original wealth accumulation of rural households is obviously little. This prompted farmers to seize the land contract rights and homestead use rights, hoping to exchange them for more wealth.

China is now imposing block land prices that make the compensation for land expropriation and relocation far higher in urban areas than in remote areas. This partial compensation gap sets a high threshold for farmers to migrate to cities, and also stimulates all land-use rights holders to seek high compensation. This is not conducive to promoting the orderly transfer of land. Farmers regard farmland transfer as a short-term behavior, which is not conducive to the long-term planning of farmland and the organization of agricultural production, and affects soil fertility.

The Income Gap between Urban and Rural Areas Encourages Farmers' Parasitism

The high income, high social welfare and high public basic services in cities attract farmers to leave the countryside and enter the cities [33]. Housing prices in cities are much higher than those in rural areas, which is the main obstacle to farmers' settlement in cities. Peasants look forward to going to the city, but the security of life there cannot be guaranteed. So farmers hold on to the farmland to get more wealth and social security. We could catch these data of disposable income, wage income and property income of urban and rural residents in 2000-2020, which come from the Statistical Yearbooks published by China Statistics Press [34] (Table 1).

The ratio of per capita disposable income has little fluctuation. The maximum value of the ratio of per capita disposable income appeared in 2007, and then decreased gradually. However the absolute gap in per capita disposable income between urban and rural residents is gradually widening. For the wage income, the maximum value of the relative difference was seen in 2004 and then decreased gradually (Table 1). The main reason is that the proportion of per capita disposable wage income of rural residents is increasing gradually, and the growth rate is obviously higher than that of urban residents. The per capita disposable income and wage income of rural residents in 2020 were 17131 yuan and 6974 yuan, an increase of 6.93% and 5.94% over the previous year. The per capita disposable income and wage income of urban residents

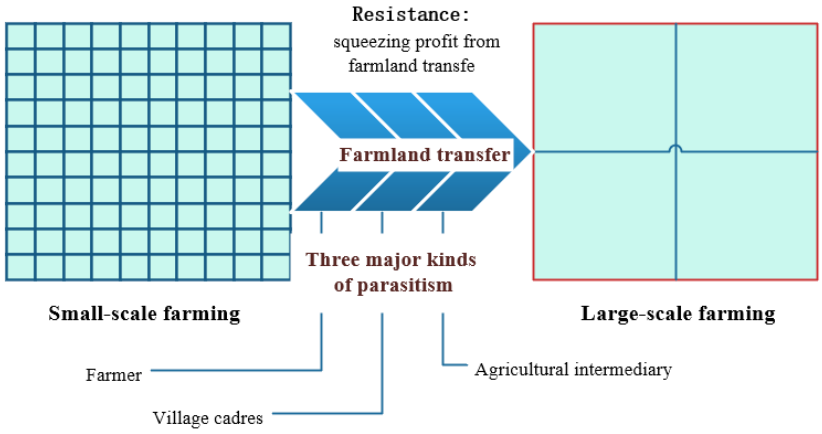

Figure 1. Three major kinds of parasitism in farmland transfer.

Table 1. Disposable income, property income and wage income of urban and rural residents from 2000 to 2020 (yuan).

Year	Per capita disposable income				Per capita wage income				Per capita property income			
	Urban	Rural	Rural-urban ratio	Urban-rural difference	Urban	Rural	Rural-urban ratio	Urban-rural difference	Urban	Rural	Rural-urban ratio	Urban-rural difference
2020	43834	17131	2.56	26703	26381	6974	3.78	19407	4627	419	11.04	4208
2019	42359	16021	2.64	26338	25565	6583	3.88	18982	4391	377	11.65	4014
2018	39251	14617	2.69	24634	23792	5996	3.97	17796	4028	342	11.78	3686
2017	36396	13432	2.71	22964	22201	5498	4.04	16703	3607	303	11.90	3304
2016	33616	12363	2.72	21253	20665	5022	4.11	15643	3271	272	12.03	2999
2015	31195	11422	2.73	19773	19337	4600	4.20	14737	3042	252	12.07	2790
2014	28844	10489	2.75	18355	17937	4152	4.32	13785	2812	222	12.67	2590
2013	26467	9430	2.81	17037	16617	3653	4.55	12964	2552	195	13.09	2357
2012	24127	8389	2.88	15738	15247	3123	4.88	12124	2231	165	13.52	2066
2011	21427	7394	2.90	14033	13673	2734	5.00	10939	1903	157	12.12	1746
2010	18779	6272	2.99	12507	12372	2278	5.43	10094	1414	144	9.82	1270
2009	16901	5435	3.11	11466	11333	1940	5.84	9393	1088	122	8.92	966
2008	15549	4999	3.11	10550	10438	1766	5.91	8672	905	112	8.08	793
2007	13603	4327	3.14	9276	9561	1543	6.20	8018	758	100	7.58	658
2006	11620	3731	3.11	7889	8305	1336	6.22	6969	484	81	5.98	403
2005	10382	3370	3.08	7012	7456	1147	6.50	6309	352	73	4.82	279
2004	9335	3027	3.08	6308	6900	980	7.04	5920	271	65	4.17	206
2003	8406	2690	3.12	5716	6224	905	6.88	5319	209	57	3.67	152
2002	7652	2529	3.03	5123	5610	829	6.77	4781	144	45	3.20	99
2001	6824	2407	2.84	4417	4723	764	6.18	3959	179	43	4.16	136
2000	6256	2282	2.74	3974	4405	697	6.32	3708	159	42	3.79	117

Note: Rural-urban ratio = Urban/Rural; Urban-rural difference = Urban-Rural. Data from China Statistical Yearbook.

were 43834 yuan and 26381 yuan, an increase of 3.48% and 3.19% over the previous year. The relative gap narrows, but because of the big difference between the base figures, the absolute difference is not narrowing but widening.

The growth rate of rural residents' income is higher than that of urban residents, and the income base of rural residents is less than that of urban residents. Therefore, it can be predicted how many years it will take for rural residents to catch up with urban income through the following Equation (1) by the data in Table 1.

$$\begin{cases} FI\{\prod_{i=1}^{m}[1+r_{FI}(i)]\}^{\frac{n}{m}} \geq UI\{\prod_{j=1}^{m}[1+r_{UI}(j)]\}^{\frac{n}{m}} \\ FI\{\prod_{i=1}^{m}[1+r_{FI}(i)]\}^{\frac{n-1}{m}} < UI\{\prod_{j=1}^{m}[1+r_{UI}(j)]\}^{\frac{n-1}{m}} \end{cases} \quad (1)$$

Solving the Equation (1), it can get n from Equation (2):

$$1+m\ln\frac{UI}{FI}\times\left\{\ln\frac{\prod_{i=1}^{m}[1+r_{FI}(i)]}{\prod_{j=1}^{m}[1+r_{UI}(j)]}\right\}^{-1} > n \geq m\ln\frac{UI}{FI}\times\left\{\ln\frac{\prod_{i=1}^{m}[1+r_{FI}(i)]}{\prod_{j=1}^{m}[1+r_{UI}(j)]}\right\}^{-1} \quad (2)$$

where FI is the income of farmers (rural residents), UI means the income of urban residents, $r_{FI}(i)$ reflects the growth rate of FI in ith *year,* $r_{UI}(j)$ represents the growth rate of UI in jth *year*, m means the selected observation period, n is the function of being solved, indicating how many years the income of rural residents will catch urban residents.

Take 2020 as the benchmark year, nearly ten years (m=10) as the observation period. By taking the per capita disposable income (DI) and per capita wage income (WI) of urban and rural residents as the research objects, it can be calculated $n^{DI} = 57$, $n^{WI} = 40$.

$n^{DI} = 57$ means that it will take 57 years for the disposable income of rural residents to have equal income with urban residents, in 2077. It is based on the average growth rate of the disposable income of urban and rural residents in the past decade.

$n^{WI} = 40$ means that it will take 40 years for the wage income of rural residents to have equal income with urban residents, in 2066.

The most obvious is the gap in income between urban and rural residents, which has seriously prevented farmers from settling down in cities.

From the perspective of urban and rural property values, the gap between them is very significant. In 2013, China's Bureau of Statistics unified the statistical standards for residents' property. Since then, the relative value of the gap has gradually narrowed, but the property gap by 2020 is as high as 11.04 times. Property income in the statistics only includes interest, rent, etc., but not premium income from transferring the ownership of the assets. If this premium income is included, the gap between urban and rural property income will expand to 30 times. For the Chinese traditional concept of buying houses to settle down, the gap in the ability to pay for houses, or the wealth gap brought by urban and rural real estate, is huge, and has gradually become difficult to straddle.

Besides, the wage income and property income difference, with absolute difference expanding, force the peasants to hold the land for survival, which is reflected in farmers' high degree of dependence on the contracting right to farmland and the use right of the homestead. Then, gradually, the right to land is applied to "become rich by relocation", which deviates from the economic system of distribution according to work.

ALCGVAP Encourages Farmers' Parasitism

At present, China's farmland expropriation compensation is based on the *Agricultural Land Classification Gradation and Valuation of Area Piece* (*ALCGVAP*). It is regularly issued by the province. *ALCGVAP* is calculated according to factors such as land category, output value, land location, agricultural land grade, per capita number of cultivated land, land supply and demand relationship, the local economic development level and the minimum living security level of urban residents. Its main factor is the land location. The land that is closer to the town center has more advantages, and has more farmland expropriation compensation. In fact, the expropriation of farmland is the government's redemption of land from farmers, which means farmers sell the right to use farmland to the government. Therefore, the gap between farmland transfer compensation and expropriation compensation can be judged by the farmland sale-to-rent ratio (*FSRR*). This ratio is the comparison between the compensation for the expropriation of a piece of farmland and the compensation for this land leasing. The calculation formula is as follows:

$$FSRR = \frac{FEC}{FTC} \tag{3}$$

where, *FSRR* is the farmland sale-to-rent ratio, *FEC* is the farmland expropriation compensation which is published by the provincial government through *ALCGVAP* regularly, *FTC* means the farmland transfer compensation, which is the price of leasing farmland.

In order to reflect the situation objectively, the plots with the same agricultural land output value but distinct land locations in Shijiazhuang area were selected for analysis. The fertility of farmland and the output value of crops in the main urban area of Shijiazhuang, Luancheng district and Zhao County are almost the same. The three regions are connected in turn. Their farmland is leased for agricultural production at similar prices. The locations of the three regions on the map are shown in Figure 2.

Through the investigation of the three regions in the North China Plain, the farmland transfer can be divided into three forms.

The first type neither depends on government subsidies, nor changes the nature of farmland production. It is farmland transfer by single leasing out (*SLO*). The annual leasing price is 3-12 thousand yuan/ha, about 1/4 of farmland output value. When the lease price is below 3 thousand yuan/ha, farmers will abandon leasing out and choose farming methods of "once and for all", such as planting trees, or idling of farmland.

The second type is farmland transfer by changing production leasing out (*CPLO*). It does not depend on government subsidies, but changes the nature of the original farmland production, such as cultivation of cash crops like medicinal herbs and vegetable sheds. The annual leasing price is about 15-24 thousand yuan/ha, more than 1/2 of the output value of common farmland.

The third kind is farmland transfer depending on subsidy leasing out (*DSLO*). It depends on government subsidies, and some agricultural land changes the nature of the original farmland production. For the farmland transfer that obtains special government subsidy, the annual leasing price is 9-18 thousand yuan/ha, about 1/2 of the output value of common agricultural land. There is timeliness for government subsidy, so it is easy to emerge a phenomenon of "abandonment of cultivation and break of the contract" when the government subsidy period is over and subsidy can not be enjoyed.

The interval feature of farmland lease price mainly depends on its fertility and the local agricultural labor force. In order to facilitate the calculation, the average value is used to represent the interval value of the farmland transfer compensation. This requires an emendation of Equation (3), which is as follows:

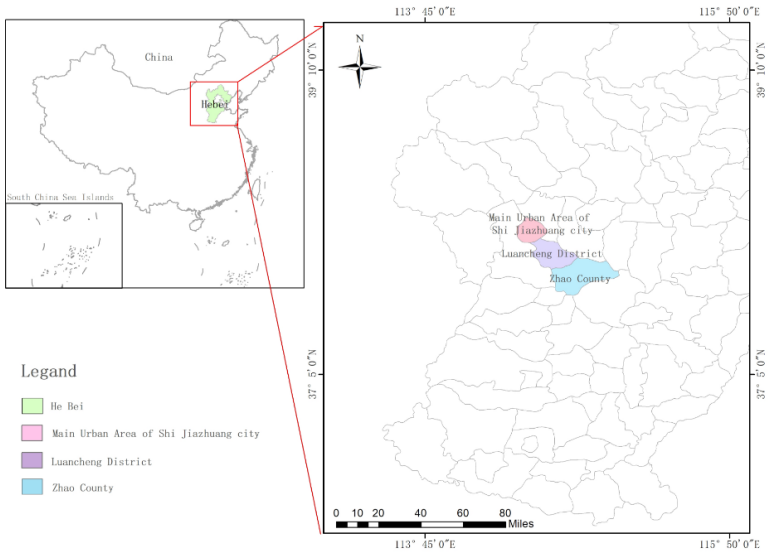

Figure 2. Map of Shijiazhuang area in North China plain.

$$FSRR' = \frac{FEC}{(FTC_{\min} + FTC_{\max})/2} \tag{4}$$

where, $FSRR'$ is the amended value of farmland sale-to-rent ratio, $FTC_{\min}$ is the minimum value of farmland transfer compensation, and $FTC_{\max}$ is the maximum value.

In 2020, Hebei Province published *Agricultural Land Classification Gradation and Valuation of Area Piece in Hebei Province* [35]. The land of the main urban area of Shijiazhuang city was divided into four classes. Luancheng district was divided into two classes. Zhao County was divided into five classes.

In order to perceive the block grade division more directly, the three observation regions in Figure 2 are enlarged and simplified to obtain Figure 3.

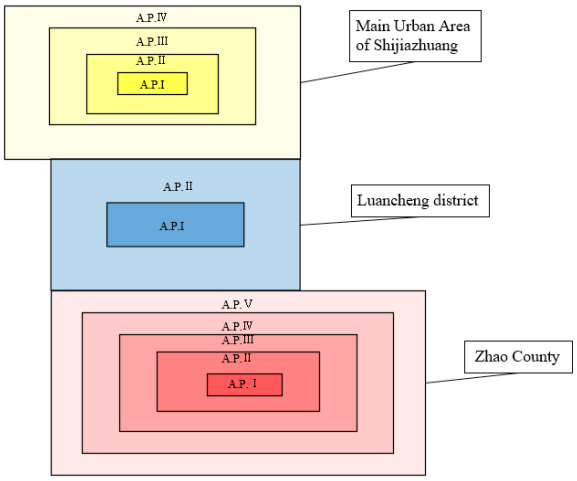

Figure 3. The plot of land price classification in three observation regions.

According to the block land prices of the three survey regions, and the data of farmland leasing prices were surveyed. **Table 2** is obtained by the Equation (4).

Table 2 indicates that the farmland expropriation compensation in *A.P. I* of the main urban area of Shijiazhuang city was 900 times higher than that of *SLO*. It means that the compensation for the expropriated farmland in *A.P. I* of the main urban area was equivalent to leasing the farmland for 900 years. There was relatively little agricultural land in *A.P. I* of the main urban area, most of which belonged to the *A.P. III* and *A.P. IV*. The compensations for the *A.P. IV* in the main urban area of Shijiazhuang city were 300 times higher than that of *SLO*, 167 times higher than that of *CPLO* and 115 times higher than that of *DSLO*.

A.P. II in the Luancheng district, the farmland expropriation compensation was 240 times higher than that of *SLO*, 133 times higher than that of *CPLO* and 92 times higher than that of *DSLO*.

As a traditional agricultural production area, except for *A.P. I* and *A.P. II*, the other lands in Zhao County are mostly farmlands. Even for A.P.V, the compensations were 159 times higher than that of *SLO*, 88 times higher than that of *CPLO* and 61 times higher than that of *DSLO*. This evidently reflected that the compensation for expropriation farmland was much higher than the farmland transfer compensation.

From Table 2 and Figure 3, it is easy to analyze the two reasons why farmers tightly hold the right of farmland and are unwilling to withdraw, and transfer farmland for a long time. One is the farmland sale-to-rent ratio, and the other is the gap in land compensation at regional boundaries.

Table 2. Sale-to-rent ratio of the three survey regions in Shijiazhuang area.

	Main urban area of Shijiazhuang city (thousand yuan/ha)				**Luancheng district (thousand yuan/ha)**		**Zhao County (thousand yuan/ha)**				
	A.P.I	A.P.II	A.P.III	A.P.IV	A.P.I	A.P.II	A.P.I	A.P.II	A.P.III	A.P.IV	A.P.V
	675	450	315	225	213	180	126	125	123	120	119
SLO	900	600	420	300	284	240	168	167	164	160	159
CPLO	500	333	233	167	158	133	94	93	91	89	88
DSLO	346	231	162	115	109	92	65	64	63	62	61

Note: A.P. is an area piece, which is a block of the city or county. The prices of different A.P. were published by *ALCGVAP in Hebei Province*, in 2020. 10.

Farmland sale-to-rent ratio makes farmers hope that farmland will be expropriated. Regional boundary compensation difference causes poor rich and poor. The social and economic value produced by a piece of farmland is the same, just because the regional affiliation is different, the compensation difference is very significant. When expropriating farmland, farmers hope that their farmland can be divided into high grade plots to obtain more compensation. When organizing farmland transfer, farmers prefer short-term farmland transfer.

According to the above analysis, it is known that the parasitism of farmers' dependence on farmland transfer mainly stems from the urban-rural income gap and the block land price (Figure 4).

The urban-rural income gap makes farmers afraid to give up the right to use farmland, and want to use farmland in exchange for more social security. Block land prices to widen the gap between rich and poor. When the gap is too large, would affect the enthusiasm of farmers to work, and affect the healthy development of the economy.

As the contracting right of farmland belongs to the welfare brought by the identity of collective organizations, farmers are reluctant to move out of rural collective organizations, which not only affects the orderly transfer of farmland, but also hinders the orderly promotion of urbanization.

3.2 The Involution Parasitism of Village Cadres' Rent-seeking with Power

Rent-seeking with power refers to an activity that seeks or maintains vested interests through the power of cadres. When there lack of effective restrictions and supervision, there will be rent-seeking with power. Because of the weak restrictions and supervision in rural areas, there is serious rent-seeking with power [36]. In 1997, in Pingdu City of Shandong Province, a "two-field system" was introduced, which improved the efficiency of agricultural production and the collective economy. In some developed coastal areas, the "two-field system" was promoted quickly but failed. The direct cause of the failure is that farmers' contract right to land is forcibly reclaimed, and the contract fee for land is increased at will, which increases farmers' burden and results in farmers' strong dissatisfaction. Therefore, this "two-field system" is not supported by the Central Committee. This is the typical failure of large-scale farming due to cadres' right to rent-

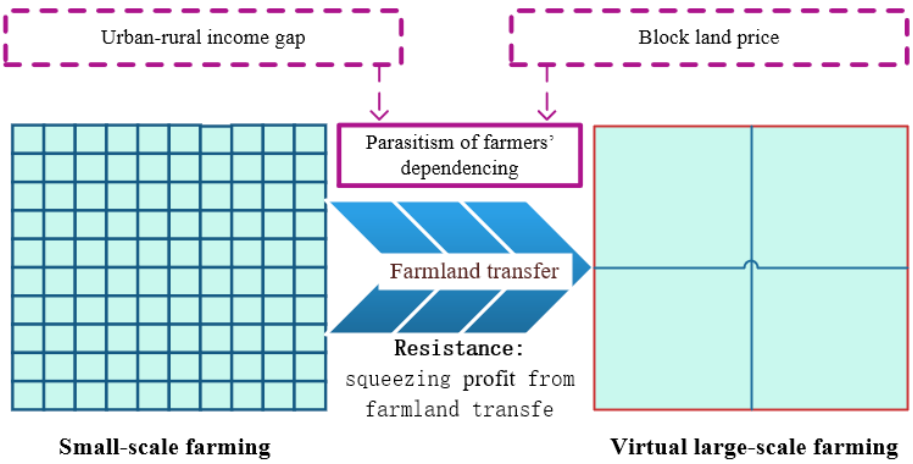

Figure 4. Two main reasons for parasitism of farmers' dependence on farmland transfer.

seeking. The more times farmland is transferred, the more space for power rent-seeking, and the higher the probability of failure. Based on this, some scholars propose marketization [37,38]. That means that land use rights are fixed [4] and land is transferred orderly [39,40] to balance cadres' right to rent-seeking.

In the 1970s, land transfer and large-scale farming with the form of market orientation and private ownership of land were practised in Japan [41]. In 1962, Japan's Agricultural Land Law stipulated that the top limit of the possession of farmland is moderated and eligible agricultural legal persons are allowed to buy farmland to expand agricultural production. Large farmer-households are encouraged to buy farmland from small ones. These reforms allowed for free trade of farmland introduced market mechanisms to expand the scaling, but it was not effective.

By 1970, its scaling had not increased but declined from 521 thousand in 1960 to 353 thousand. The reasons are as follows.

First, in the absence of integrated planning and management, it is difficult to form effective scaling management for the small scale of private land ownership. Second, with the development of industrialization and urbanization, the marketization and privatization of land increase the price of land, which increases the cost of land and weakens the scaling of land. From 1960 to 1973, the price of paddy fields in Japan increased nearly 14 times for non-agricultural land and 17 times for non-agricultural highlands. Land prices for agricultural paddy fields increased by 10 times, and for agricultural highlands by 14 times [42].

The marketization and privatization of land increase the farmland cost and make it difficult to realize the scaling of agricultural production. In 1975, the total area of idle land in Japan was 131 thousand hectares and it had increased to 218 thousand hectares by 2015. One of the important reasons for this is the high price of farmland. To get more compensation, the owners of farmland prefer idle land to transfer the land [43].

According to the historical experience of Japan, it is known that private ownership of land and marketization have not promoted orderly land transfer and large-scale farming, but have obviously contributed to the rise of farmland prices and the waste of land. It is not ideal to promote large-scale farming through marketization, and there is the risk of capitalization of agriculture. Based on the international experience, it is common that large-scale farming is governed, subsidized and supported by the government. For example, from 1962 to 1975, the French government bought 840 thousand hectares of agricultural land at high prices and sold 710 thousand hectares to 106 thousand farms at low prices. In 1967, the Agriculture Act of England provided £2,000 at most for people who gave up on small-scale farming; From 1966 to 1975, West Germany implemented a "bonus for change of occupation" to help small-scale farmers to change their occupation, which promoted the transfer of 37.13 million hectares of land [44].

Agriculture is a matter of national security, and all countries attach great importance to agriculture. When only the government or the market is used to promote the farmland transfer, it would lead to failure in the end (Figure 5). When village cadres use power on behalf of the government, it is inevitable to steal agricultural subsidies and use power to gain benefits for individuals. The invisible hand of the market will drive up land prices and eventually hinder the orderly farmland transfer.

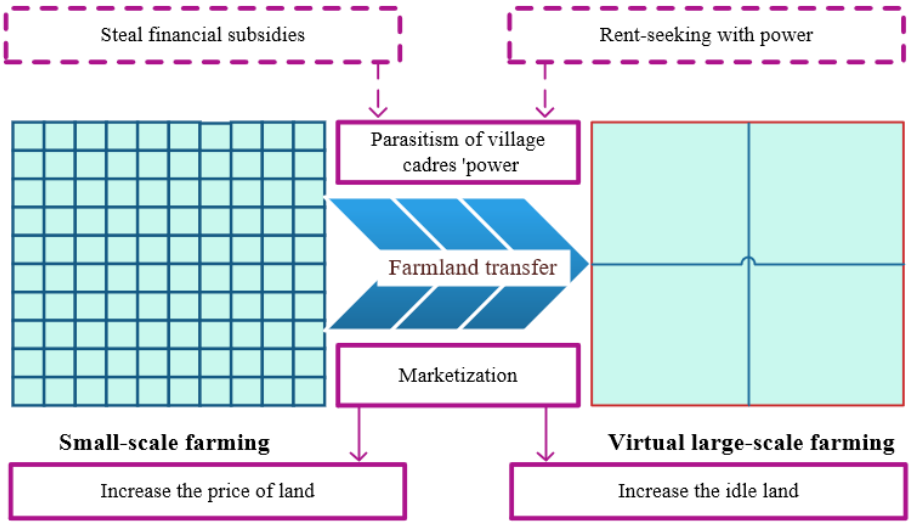

Figure 5. The inherent inadequacy of government and market in farmland transfer.

There is a risk for both pure marketization and cadres' rent-seeking with power. The only method to get rid of parasitism in large-scale agricultural production is to set up a policy of compensation with social justice for land transfer, which will make it open and transparent and achieve a balance between safety and efficiency.

3.3 Agricultural Intermediary's Virtual Parasitism

Most Cooperatives were Virtual Organization

In October 2006, the 24th meeting of the Standing Committee of the 10th National People's Congress adopted the Law of the People's Republic of China on Peasant Professional Cooperatives. It is stipulated that "On the basis of the contracted management of rural families, farmers' professional cooperatives are mutually supportive economic organizations that ally voluntarily and manage democratically." It operates the same agricultural production, or provides and utilizes the management services of the same agricultural production. Farmers' professional cooperatives, whose members are the main target of service, provide services such as the purchase of agricultural means of production, the sale, processing, transportation, storage of agricultural products, technology and information related to agricultural operation. Article 3, paragraph 3, provides that "It is free to join and withdraw from the cooperative" [45].

According to the China Bureau of Statistics, by the end of 2020, the number of agricultural cooperatives had reached 2.241 million [46], and 512,500 administrative villages [47], which means administrative villages have four agricultural cooperatives in China. Most agricultural cooperatives are in a virtual and parasitic state [48]. According to the investigation of some parts of North China, it is found that in most cooperatives in order to attract farmers to join the cooperative, some agricultural materials (a bag of fertilizer, a bottle of pesticide, etc.) are distributed as conditions for joining the cooperative. After joining the cooperative, farmers' activities are nothing but mainly submitting their identity cards and receiving prizes.

Cooperatives are voluntary cooperative organizations in which the working people join together voluntarily for cooperative production and cooperative operation. According to this definition, the cooperatives are not very different from production teams. That is to say, it is not different from village committees. Village committees cannot manage agricultural operations, and cooperatives could not be more effective. The core members of the cooperative are mostly the leaders of the village committee, or those who have nepotism with the village committee. Village committees cannot rejuvenate agriculture, and the efforts of cooperatives may be limited.

Most cooperatives were virtual organizations. It could not organize agricultural production. Its reasons could be attributed to the following two points.

First, farmers don't need co-production.

A Cooperative is a mutually supportive economic organization that provides services for farmers of the same agricultural products or servers of the same type of agricultural operation. With the increase in migrant workers' income, farmers have less and less labor power to engage in agricultural production. The mechanization and singularization of agricultural production are more and more obvious. Singlularization facilitates the purchase of farm products. At present, wheat harvesting in North China is accompanied by storage. Corn is saved for food, and can also be sold for storage conveniently. Sowing and harvesting are finished by employing an agricultural machinery service team. Harvesting and selling for storage can be carried out at the same time, and the whole process can be completely free of cooperatives. This is also one of the main reasons why most cooperatives are meaningless.

Second, cooperative organizations could not provide risk protection.

The benefits brought by small-scale farming are limited, and based on opportunity cost, most farmers are reluctant to invest too much time, energy and capital in agricultural production. Farming of singlularization with low input and income has become the best choice for farmers to engage in agricultural production under the over-decentralized mode of smallholder production, which is an important reason for the imbalance of the agricultural supply structure in China. If cooperatives do not agree with the farming of singularization and would change agricultural products, they need to provide risk management for farmers. Because cooperatives are non-profit organizations and lack financial support in guiding agricultural production, it is difficult to change farmers' farming. In addition, the popularity of e-commerce increases the convenience of doing with the means of production, and farmers can improve their efficiency without intermediaries. Cooperatives' value in helping to buy agricultural means of production is also diminishing.

Gaining benefit directly from selling their produce or further processing of the produce, which one do farmers choose? Farmers prefer the former. The reasons are as follows.

First, agricultural income is no longer the main source of income for farmers. So with guarantees of farmers' rations, to get cash by selling agricultural products is their best option.

Second, there are risks in further processing. The risk

of market uncertainty and the risk of intermediary managers stealing benefits [49]. Because of the uncertainty factors, the ideal choice is not to participate in further processing to avoid risk.

Most cooperatives were in a virtual parasitic state mainly reflected in the stealing of agricultural financial subsidies issued by the government and could not really organize agricultural production (Figure 6).

Other Agricultural Intermediary Organizations are in a Virtual State

For land trusteeship, contract farming, land bank and so on, which were some enthusiasm to solve the problem of idle land and organize agriculture production, but most of them were in a virtual state.

Farmers, unwilling or unable to engage in agricultural production, lease their farmland to intermediaries (such as cooperatives, land banks, etc.) to obtain a certain amount of "fees for storage". Large-scale agricultural operators pay a certain amount of "fees for hiring" from the intermediaries. The difference between "fees for storage" and "fees for hiring", should be obtained by farmers or agricultural operators. But it was taken away by intermediaries. This is a kind of parasitism for squeezing profit from farmland transfer. For agricultural operators, agriculture is low profit industry and it can be guaranteed by intensive cultivation and government financial subsidies. Farmers receive low compensation for farmland transfer. In this circumstance, the intermediary organizations that organize large-scale agricultural production take some profits from farmland transfer. Eventually, it makes it difficult for all parties to obtain satisfactory benefits. This led to farmland transfer and large-scale farming was difficult to promote in China.

The main reason that agricultural intermediaries can not organize agricultural scale production is that some farmers are unwilling to transfer out of their land. They still want to work on their farmland. This makes agricultural land unable to organize effective scale production. It is difficult to bring the benefits from scale production. Therefore, agricultural intermediaries need to obtain agricultural subsidies and organize fragmented large-scale farming (Figure 7). The irregularly circled graphs in the fragmented large-scale farming of Figure 7 represent the large-scale production by agricultural intermediaries. Fragmented large-scale farming relies on local supportive policies. It is difficult to be fully promoted in the whole region.

Agricultural intermediary organizations play a more catalytic role in organizing agricultural production. But with the perfection of the mechanism of the agricultural market, this role will gradually decline, which is also the important reason for the weakening of of Japanese Agricultural Association in recent years [50]. With the improvement and stability of the agricultural market, the role of agricultural intermediary will focus on providing services for agricultural production rather than squeezing profit from farmland transfer. Paying attention to the role of agricultural intermediary services and getting rid of the parasitism of squeezing profit from farmland transfer is of positive significance for agricultural reform in China.

The intersection of three kinds of parasitism is the farmland transfer. To strip the parasitic behavior in the farmland transfer, it is necessary to establish the compensation standard of farmland transfer with social justice. Only by clarifying the compensation standard could we build an open and transparent farmland transfer system, and promote orderly farmland transfer and larger-scale farming. The specific framework is shown in Figure 8.

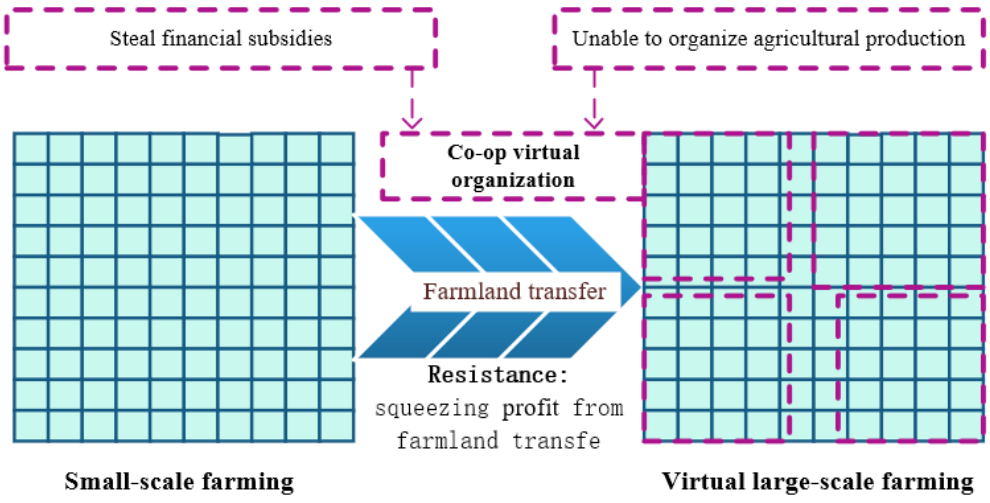

Figure 6. Virtual large-scale farming organized by cooperatives.

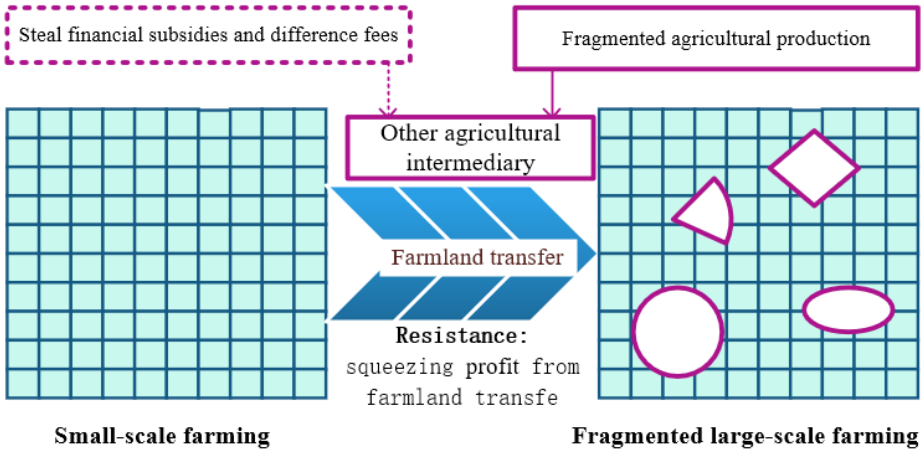

Figure 7. Fragmented large-scale farming organized by other agricultural intermediaries.

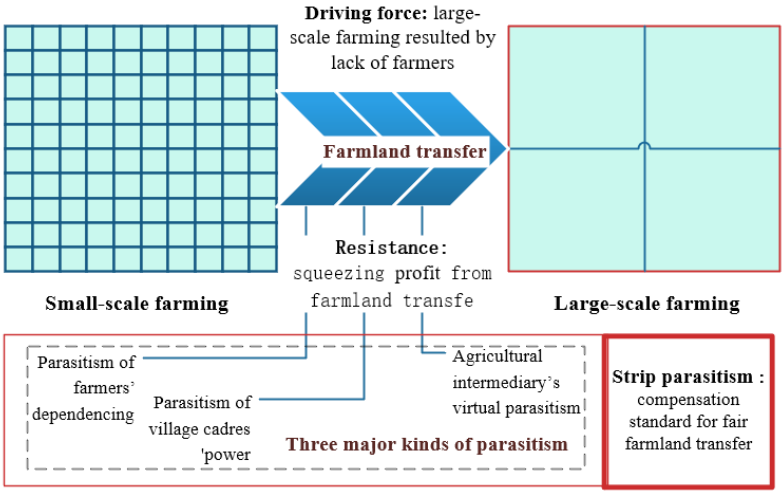

Figure 8. The driving force and resistance of farmland transfer and strip strategy.

A large number of young and middle-aged rural labor force entered the towns, and rural children entered the towns to study, which accelerated the breakage of farmers' intergenerational inheritance. A shortage of agricultural Labour is driving farmland transfers. The urban-rural income gap and block land prices would set a high threshold for rural residents to settle down in cities. This makes farmers hope that their land use rights could obtain more social security when the land is transferred. Village cadres used their power to gain more benefits for themselves. It is difficult for agricultural cooperatives and agricultural intermediaries to find profit points from the value of their providing services, so they inevitably need to steal benefits from the farmland transfer. Three kinds of parasitic behaviors interweave with each other, hindering the orderly farmland transfer. The only way to strip parasitism of farmland transfer is by setting up compensation standards with social justice and forming an open and transparent process for farmland transfer.

4. Theory and Realistic Basis for Compensation Standard for Fair Farmland Transfer

The first step of large-scale farming is the farmland transfer [51]. From the above analysis, it can be known that the intersection of the three kinds of agricultural parasitism is farmland transfer. Therefore, compensation standard for farmland transfer with social justice is the key to solving the bottleneck of large-scale agricultural production, and it also determines the breadth and depth of agricultural production scaling.

4.1 Theoretical Basis of Compensation Standard for Fair Farmland Transfer

Before discussing the fairness of compensation standard for farmland transfer, it is necessary to make it clear whether the farmland transfer belongs to the primary

distribution or the secondary distribution. With the implementation of household contract responsibility system, cultivators begin to own their own farmlands. According to the distribution system, with contracting rights, farmers' income from farming belongs to primary distribution. The great success of the household contract responsibility system is attributed to the system of distribution according to work. Farmland transfer is a step in which farmers leave their farmlands and lease the farmland out to obtain corresponding compensation, which is definitely secondary distribution. So, the leasing out, transfer, expropriation of farmland and relocation of houses are all secondary distribution. Secondary distribution should reflect the social justice constructed by stability, justice and efficiency.

Based on secondary distribution, the social justice of farmland transfer should be reflected in two aspects. One is to prevent the occurrence of low compensation for the transfer of farmland, which will result in farmers' reluctance to participate in the transfer, idle lands, and the loss of basic (rations) security for farmers, thus forming "slums". Second, excessive compensation for farmland transfer should be avoided, because it will raise the feeling of unfairness for the non-compensation group and result in the rich and poor.

The Constitution of the People's Republic of China clearly stipulates that the foundation of the socialist economic system of the People's Republic of China is the socialist public ownership of the means of production, and the main distribution system is distribution according to work [52]. Rural collective economic organization is a kind of collective ownership system of working masses based on socialist public ownership, and should not be a tool of transferring land use to obtain huge social wealth. The exchange of land use rights for huge wealth artificially widens the gap between rich and poor, violates the basic economic system of distribution according to work and weakens citizens' enthusiasm for labor.

On the one hand, some exchange land use rights for large wealth, and their enthusiasm for labor weakens because of the wealth. On the other hand, when the wealth compensated by the land use right exceeds the wealth unavailable for a generation through labor, these people will lose enthusiasm for labor because they cannot become wealthy through labor. Because of this weakening of enthusiasm for labor, creativity for material wealth will inevitably decrease, which will lead to economic depression, inefficient or ineffective social governance.

Successful social governance requires ensuring an increase of economic efficiency and public service efficiency, striving to achieve complete equality of opportunities for development for members of society, guaranteeing survival at the bottom line, fairness on differences of salary, and achieving social stability by amplifying the law and promoting morality [53]. For a country, the standard of success in social governance revolves around social justice built by stability, efficiency and equality [54]. The principle of social justice regarding land transfer and compensation for relocation was issued by the State Council in October 2004 in the Decision of the State Council on Deepening Reform and Intensifying Land Management [55], which stipulates that "the life level of the farmers whose land have been expropriated shall not be reduced".

In August 2006, the State Council issued the Notice of the State Council on Strengthening the Control of Land [56] to improve the compensation for expropriated peasants, and put forward that "The original life level of the expropriated peasants will not be reduced and the long-term livelihood will be guaranteed". The implication of "the original life level will not be decreased" should refer to two levels. One is the original life level will not be decreased to guarantee the bottom line of compensation. Second, excessive compensation should be avoided to prevent artificial differences between rich and poor. At present, a new gap between rich and poor has resulted from compensation for relocation [57], and the idea of "becoming rich" through relocation has intensified people's dependence on the right to land use.

Land is the basis for the survival of the people of the country, and the right to land use should be more reflected in social security, rather than as a tool for citizens to seek huge wealth. Based on the rule of social justice, getting rid of the parasites in the farmland transfer means setting up the fairness of compensation standards for farmland transfer.

4.2 Status of Compensation for Farmland Transfer and Expropriation in Investigated Area

Through the investigation of the three regions of the Shijiazhuang area in the two-cropping areas of the North China Plain. The farmland leasing price was obtained in Table 2. Through communication with farmers, it could be known that the leasing price of farmland was 1/2 of the output value of agricultural land. When the value of agricultural land was about 9-18 thousand yuan/ha, farmers had high satisfaction. The output value of farmland is regarded as the base for the leasing price. Its main reason is to prevent the rising of price of agricultural products which will result in farmers' losing the security of their rations.

According to the data of the China Statistical Yearbook, in 2020, nationwide per capita consumption of grain (unprocessed) and vegetables in China is shown in Table 3 [34].

Table 3. Nationwide per capita consumption of grain and vegetable in China in 2020 (kg).

Grain (unprocessed)			**Vegetable and edible mushroom**	
	Cereals	Tuber	Beans and products	Fresh vegetables
141.2			103.7	
	128.1	3.1	10.0	100.2

The nationwide per capita consumption of grain (unprocessed) was 141.2 kg, and 103.7 kg of vegetable and edible mushroom (Table 3). According to the statistics bulletin in 2020, the agricultural household registrational population is little less than 777 million people, the annual grain cultivation area is 116.77 million hectares, and the annual grain output is 669.49 million tons [58]. According to this, it can be calculated that the agricultural household has a per capita of 0.15 hectares of a grain planting area, and the grain output per hectare is about 5733 kg. When the compensation for farmland transfer is 1/4 of the value of farmland output, the average agricultural household can get 215 kg of grain for farmland transfer, which can meet one person's grain (unprocessed) requirement for one year. When the compensation for farmland transfer is 1/2 of the value of farmland output, it will be about 430 kg of grain, which can meet the grain (unprocessed) needs of two persons for one year and the vegetable and edible mushroom needs of one person.

When the compensation of farmland transfer is 1/4-1/2 of the value of farmland output, the basic life of farmers who transfer out their farmland could be satisfied. Since there is no need to engage in agricultural production, this agricultural surplus labor force could earn wage income from other industries to improve their lives. This is the way to achieve urbanization.

5. Conclusions and Implications

In recent years, informatization and mechanization have significantly improved agricultural productivity, expanded the radius of farmers engaged in agricultural production and life, and consolidated the foundation for large-scale agricultural production in China. With the development of urbanization, a shortage of agricultural labor force leads to farmland transfer and large-scale agricultural production. The parasitism of "squeezing profit from agriculture" was declining the speed of farmland transfer.

Farmers' dependence on farmland stems from the urban-rural income gap and block land price. The greater the gap is, the stronger the dependence is. Farmers' irrational expectation for compensation interferes with farmland transfer and results in idle land. Village cadres' rent-seeking with power depletes the rural collective economy and hastens the decline of rural areas. The imperfect system of supervision and restriction on village cadres increases the possibility for village cadres to reap benefits from farmland transfer and large-scale farming. Intermediary institutions have promoted large-scale farming to a certain extent, but they rely on government financial subsidies and price difference of farmland transfer to maintain their operation. It organizes large-scale farming with loose structure and unsustainability.

Compensation standards for farmland transfer with social justice and fair, which can effectively resolve the parasitism of "squeezing profit from agriculture" in farmland transfer. Compensation standards for farmland transfer with social justice lay a foundation for the openness and transparency of farmland transfer, which is of positive significance to prevent cassette operation and rent-seeking with power. It can also make farmers treat farmland use rights in a rational manner and take part in the farmland transfer easily, and can promote the orderly implementation of agricultural production.

Based on the above conclusions, this paper has two implications:

(1) Based on logical analysis and investigation of the Shijiazhuang area in two cropping areas of North China Plain, the output value of farmland can be relied on to set compensation standards for farmland transfer.

First, the compensation standard for leasing-out farmland transfer does not change the nature of the land. Owing to the contract right of farmland, farmers can recall their land on expiration of the contract. Therefore, the leasing price in the market should be the compensation standard for leasing-out farmland transfer, that is, 1/4-1/2 of the original agricultural output value of the farmland. This compensation can meet farmers' basic food requirements after their farmland transfer and sustain their livelihoods. Because of this, it is necessary for landless farmers to actively engage in productive labor to improve the quality of life, which meets the requirements of distribution according to work.

Second, the compensation standard for expropriation and relocation through which the nature of farmland is changed. Farmers will lose their land and the right to contract. This kind of expropriation is usually in the suburbs of the city where the living cost is relatively high, and the whole income of farmland can be regarded as its standard of compensation. This enables these farmers to obtain all

the farmland earnings without taking part in agricultural production, and undoubtedly ensures that there is no decrease in their living standard. After land expropriation, stable life can be guaranteed and quality of life can be improved through labor, which is beneficial for the sustainable development of the national economy. At the same time, the thought of "becoming rich" through expropriation and relocation can be prevented, and the social order of distribution according to work can be maintained.

(2) A farmland transfer platform can be built on the basis of government credibility. Constructing a unified transfer platform based on the government's credibility to guarantee the authenticity, openness and transparency of information. In recent years, all the provinces have built the agricultural land transfer platform. By clicking through these platforms, they were less than 15% really operating. Improving the platform construction and improving the platform operation supervision mechanism will have a positive significance in promoting the orderly circulation of agricultural land. The two parties of farmland transfer can publish information through the platform. Farmland can be handed over to the platform, which will transfer the land to the land operator through sorting and planning. With this platform, maximum integrity can be obtained for the two parties of transfer, which is beneficial for orderly land transfer and stable agricultural production. At the same time, the situation of land transfer can be awarded in time through the platform, which is convenient for the adjustment of supervision and policy.

Author Contributions

Jingqiang Geng is the first author and corresponding author of this paper, he is responsible for the research design and model design of this paper. Qingqing Huo is responsible for the research data analysis, and wrote this paper. Shanshan Jia helped to organize the survey and data collection, and gave many comments to revise this paper.

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Data Availability

The data are available upon request from the corresponding author.

Conflict of Interest

All authors disclosed no conflict of interest.

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