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Improving Farmer Willingness to Participate in the Transfer of Land Rights in Rural China: A Preference-Based Income Distribution Scheme

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Abstract: Promoting the transfer of rural land is an important way for many developing countries to improve the efficiency of rural land use and develop the rural economy. A reasonable income distribution scheme (IDS) is the key to enhancing farmer willingness to participate in the transfer of rural construction land use rights. However, little attention has been paid to farmers' preference for the IDS of the transfer of rural collective construction land use rights. This research aims to detect the farmers' preference for IDS in the process of rural collective land rights transfer. Based on the survey data of 489 farmers in Liuyang City, Hunan Province and Deqing County, Zhejiang Province, China, a random parameter Logit model is used to explore their preference for the IDS of the transfer of rural collective construction land use rights. The results show that, in general, the farmers focus on the income distribution ratio and pension in the IDS, which will significantly improve their utility. There are obvious regional differences in their preference for IDSs. For example, farmers in Liuyang prefer payment in shares, while those in Deqing prefer cash. Thus, the IDS for the transfer of rural collective construction land use rights should be based on the basic principle of ensuring fair land value-added income for the farmers, increased payment forms with social security functions, and reasonable IDSs in accord with the preferences of farmers in different regions, so as to enhance farmer willingness to participate.

Keywords: farmer willingness; land use efficiency; choice experiment; land system reform; China



Citation: Yan, L.; Lei, X.; Hong, K.; Li, H.; Chen, M. Improving Farmer Willingness to Participate in the Transfer of Land Rights in Rural China: A Preference-Based Income Distribution Scheme. *Land* **2022**, *11*, 379. <https://doi.org/10.3390/land11030379>

Academic Editor: Luca Salvati

Received: 18 January 2022

Accepted: 2 March 2022

Published: 4 March 2022

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1. Introduction

Land is scarce resource that is irreplaceable for the development of human society. Whether it can be optimally allocated is directly related to the sustainable development of social economy [1–3]. In both economically developed western countries and developing countries, the rational use of land will become one of the key factors in ensuring the realization of national macro-control goals and promoting rapid social and economic development [4,5]. With the advancement of industrialization and urbanization, a large number of agricultural populations have migrated to cities and towns, resulting in idle and inefficient use of rural land, which restricts the sustainable development of social economy [6]. This phenomenon is especially common in developing countries [7–9]. An important direction for optimizing the rural human–land relationship and regional system functions is to revitalize rural land elements, activate “sleeping” assets, improve rural land use efficiency while ensuring rural revitalization industry land needs, and take land as the core to drive the integration and reconstruction of rural population, capital and technical elements [10–13]. In the context of the strictest cultivated land protection and the

prudent promotion of the reformation of the homestead system, the innovative use of rural collective construction land is particularly critical.

The rights of rural collective construction land in China are more complicated than other land-private countries [14]. Land is owned by rural collectives, and farmers are eligible for land use rights, and they can also transfer it. The proceeds from the transfer of rural collective construction land use rights need to be distributed among local government, village collectives, and farmers. In the process of the transfer of rural collective construction land use rights, farmers not only worry that the long-term transfer of rural collective construction land use rights will cause them to lose their land [15,16], but they are also often dissatisfied with the distribution ratio and income payment. This has led to low enthusiasm and willingness on the part of farmers to participate in the transfer of rural collective construction land use rights, which hinders the implementation of rural land marketization and weakens the positive effect of rural land system reform on social and economic development. Increasing the willingness of farmers to participate in the transfer of rural land use rights has become an issue worthy of attention. How to design a reasonable income distribution scheme (IDS) based on the preference of farmers has become the key to solving this problem.

The existing research mainly provides a reference for this paper to discuss the optimization of the IDS based on farmers' preference in the transfer of rural collective land use rights from four aspects: the formation mechanism and influencing factors of farmer willingness to participate in projects, the determination of the income distribution ratio among stakeholders in collective land use rights transfer, the attributes and content of IDS, and farmers' preference for a single attribute of IDS. Research on farmer willingness to participate in ecological protection shows that the cost and benefit of participating in the project are the fundamental factors that determine their willingness [17,18]. In addition, farmer characteristics, land characteristics, policy cognition, contract content, etc., also have an important impact on farmer willingness [19–21]. These findings indicate that a balanced benefit-sharing mechanism is key to the implementation of reform in the transfer of rural collective construction land use rights [22,23].

Existing studies mainly focus on the issue of income distribution among stakeholders and analyze the optimal income distribution ratio of each stakeholder [24–27]. Some studies propose what should be included in the compensation scheme or IDS for farmers from theoretical and empirical points of view. They also suggest that cash income is an important part of the IDS [17,28–30], and security such as endowment insurance should also be included [28]. Moreover, additional material incentive compensation such as labor aid or skills training should also be included in this [29]. There are empirical studies on farmers' preference for IDS in the context of cultivated land protection and ecosystem services program, which often only discuss their preference for a single attribute, such as the income, endowment insurance, and payment approaches [31–35]. However, in the context of the transfer of rural collective construction land use rights, the IDS is a combination of multiple attributes, including the income distribution ratio to farmers and different payment modes. Farmers need to make choices at different levels of each attribute in the IDS. Therefore, a willingness survey containing a single attribute cannot truly reflect the preferences and behavior choices of farmers.

In view of this, this paper designs a choice experiment of IDSs including multiple attributes and multiple levels based on the perspective of farmers, conducts field surveys in Deqing, Zhejiang and Liuyang, Hunan, which are typical areas where rural collective construction land use rights transfer takes place, and uses a random parameter logit model to estimate farmers' preference for IDSs. This research provides evidence for the improvement of the scheme of rural collective construction land use rights transfer in China. The choice experiment of the IDS with multiple attributes and multiple levels established in this paper can reveal farmers' preferences and behavioral decisions more truly and accurately.

This research aims to detect the farmers' preference for IDS in the process of rural collective land rights transfer, which provides a reference for the design of a compensation scheme for community or group participation in ecological protection or other projects involving income distribution. This paper is presented in four sections: Section 1 presents the institutional background and theoretical framework on which the research is based. Section 2 presents the methodology, including the study area, data sources, methods and variables. Section 3 includes the results and discussion. Section 4 offers the conclusions.

2. Institutional Background and Theoretical Framework

2.1. Institutional Background

The urban–rural dual land system in China determines that urban land is owned by the state, while rural land is collectively owned by farmers [36]. Rural land in China can be divided into two categories: agricultural land and rural construction land (Land Administration Law of the People's Republic of China (2020) Article 4). Agricultural land refers to land that is directly or indirectly used for agricultural production. Rural construction land refers to the space carrying land for farmers to engage in secondary and tertiary industries and living life, including rural residential land, rural public service and infrastructure land, village office and township enterprise land, etc.

Before 2020, the legal system in China stipulated that the use rights of urban state-owned construction land could be transferred to enterprises and individuals, while the use rights of rural collective construction land could not be transferred to enterprises and individuals. The use rights of rural land could only be transferred after being expropriated as state-owned construction land [37]. Since 1999, the Ministry of Land and Resources of China has successively approved more than nine regions as pilot projects to explore the transfer of rural collective construction land use rights, and the state has also issued relevant policies to promote the transfer of construction land use rights. In December 2014, the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council jointly issued the “Opinions on the Reform of Rural Land Expropriation, Collective Operational Construction Land Entering the Market, and the Pilot Reform of the Homestead System”, making overall arrangements for the reform of the “three plots”, and selected 33 regions as reform pilots. In terms of pilot selection, the Ministry of Land and Resources of China mainly followed three criteria: first, the Party committees and governments in the pilot areas attach great importance to their work and have a relatively good foundation; second, the rate of confirmation, registration and certification of rural collective land rights is high, overall land use planning and urban and rural planning are fully covered, and land management is in good order; third, rural collective organizations are sound and supported by the masses (http://epaper.bjnews.com.cn/html/2015-02/26/content_563955.htm?div=-1&news accessed on 26 February 2015). Based on the experience gained from the reform pilots, China made a third amendment, such that “the land owner can transfer, lease, etc. to the unit or individual to use the collective operating construction land, which is legally registered”. This indicates that the transfer of the right to use rural collective construction land is no longer restricted, and it can be freely transferred to units or individuals through leasing or transfer, who will obtain the same rights as for state-owned construction land [4].

Participants in the transfer of rural collective construction land use rights include farmers, land-use enterprise, village collectives, and local governments [24]. Farmers are the owners of rural collective construction land use rights, the village collective is their agent, land-use enterprises are the transferees of land use rights, and local government is the manager of the transfer of collective land use rights. According to the process of the transfer of the right to use collective construction land in rural China, it can be divided into three stages: the first stage is democratic voting. After more than two-thirds of the farmers agree, the management rights of collective construction land will be conferred on the village collective, and the village collective will act as an agent for related matters. The second stage is approval. The plan for the transfer of collective construction land

needs to be reviewed and approved by the local government and relevant departments before it can be transferred. The third stage is trading. After the plan is approved, the village collective entrusts the Municipal Real Estate Trading Center to release transaction information, organize public transactions, and sign a transfer or lease contract. In this process, the local government's investment in rural infrastructure also indirectly promoted land appreciation and circulation. After the contract is signed, the land user pays the land transfer income to the village collective. The local government reserves a certain percentage of the income as management fees, the village collective also reserves part of the income to develop the collective economy or support construction of the village's infrastructure, and the remaining income is paid to the farmers in different forms.

2.2. IDS and Farmer Willingness

Based on the income distribution methods or guidance opinions on the transfer of rural collective construction land use rights in various regions of China, the main elements related to the farmers in the IDS can be divided into three aspects [14]: the first is the income distribution ratio, that is, the proportion of the income distribution of farmers among the local government, the village collective, and themselves; the second is the average annual income standard. In most areas, the total income that farmers can obtain is measured by assuming that the transferred rural construction land is expropriated; and the third is the payment mode of the income. According to the practice of the transfer of collective construction land use rights in rural China, there are three types of payment mode for the income of farmers [38,39]: first, the one-time cash payment mode, that is, the income from the transfer of land use rights is paid to the farmers in the form of cash; second, the shareholding and cash payment mode. That is, some of the income from the transfer of land use rights is paid to the farmers in cash, and the rest is converted into shares and used to invest in the land use enterprise, so that the farmers will receive dividends from the land-use enterprise every year; third, the payment mode of cash and pension. Part of the land transfer income is paid to farmers in the form of cash, and the remaining part is used to purchase a pension so that the farmers will receive a pension every year during their old age.

The relationship between the IDS and farmer willingness is shown in Figure 1. When other conditions are fixed, the higher the average annual income, the greater the utility obtained by the farmers [40,41]. Under the conditions of a given income, different payment forms have different effects on farmers. Cash guarantees the immediate capital needs of farmers. A pension solves the livelihood problems of farmers in old age and has strong stability. Shareholding guarantees that farmers can receive a sustainable income every year, but it has a certain degree of uncertainty, and it is more risky than pension. The subjective evaluation of the same amount of cash, endowment insurance and dividends by the same farmer is different, which causes different payment modes to have different effects on farmers [42]. Even if the income is constant, the same form of payment has different levels of utility to farmers with different characteristics. In addition, with respect to the income distribution between local government, village collective, and farmers, farmers' perception of fairness will also affect the utility. According to Fehr and Schmidt (1999) and Falk and Fischbacher (2006) [43,44], the utility function of the benefit of the related subject not only reflects the amount of one's own benefit, but also includes the judgment of how much benefit of others is. In the experiment, when subjects believe they are being subjected to unfair treatment, their utility will be decreased to a certain extent.

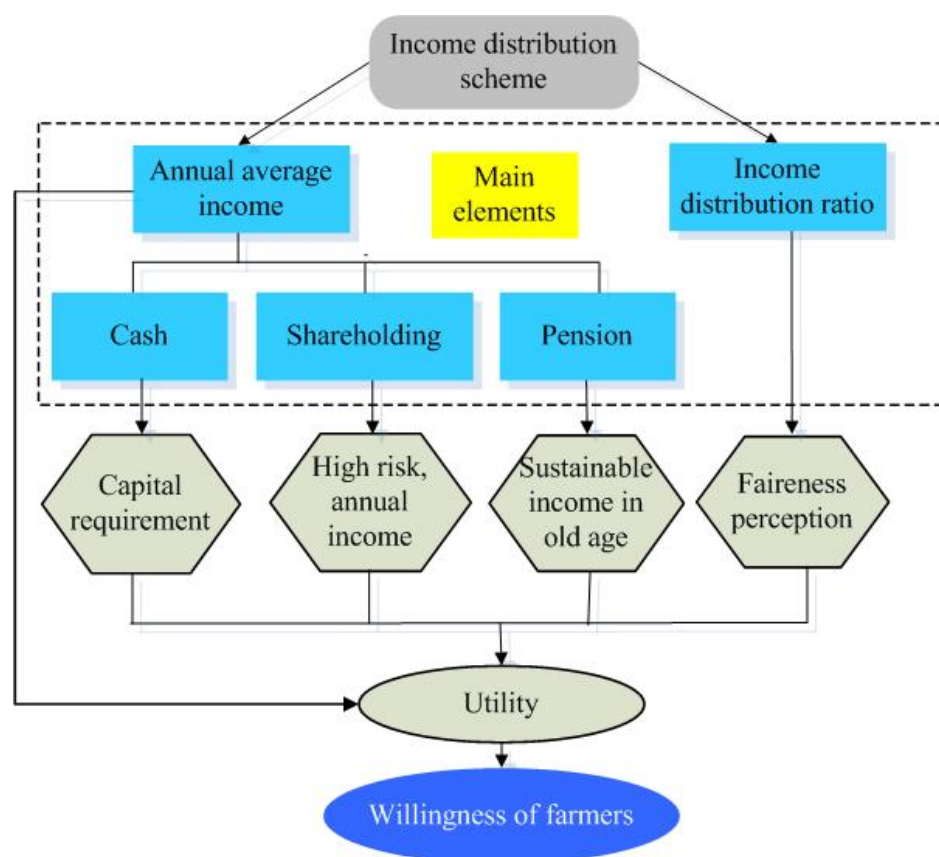


Figure 1. IDS and farmer willingness.

3. Methodology

3.1. Study Area

This study selects Deqing County, Zhejiang Province and Liuyang City, Hunan Province as the study areas based on comprehensive consideration of the implementation effect, transfer mode, supporting policies and regional economic development differences of rural collective construction land use rights transfer (Figure 2). First, their policies have been implemented well. Deqing County realized the first transfer of it in China. From 2015 to 2016, the number of rural collective construction land transfer and the total transfer area in Deqing County was greater than the total area of the other 14 pilot areas combined (https://jjsb.cet.com.cn/show_471377.html accessed on 29 January 2016); by the end of 2020, 278 rural collective commercial construction land use rights have been transferred in Deqing, with a land area of 2185.6 mu and 230,000 farmers participating, 156 collective commercial construction land use rights have been transferred in Liuyang, with a land area of 3343.16 mu and 300,000 farmers participating (http://www.mnr.gov.cn/dt/dfdt/202012/t20201223_2596097.html accessed on 23 December 2020). Second, in Deqing County, the market-led mode is the main mode; in Liuyang City, Hunan Province, the government-led mode is the main mode. Third, their relevant supporting policies are relatively comprehensive, and the income distribution schemes are diverse. Fourth, there are differences in economic and resource endowments between these two areas. Deqing County is located in the economically developed area along the eastern coast, with an advantageous geographical location, and is close to the mega-cities Shanghai and Hangzhou. However, the per capita land area is small. Liuyang City is located in an underdeveloped area in the central and western regions. Its geographical location is worse than that of Deqing County, but its per capita land area is larger than that of Deqing County.

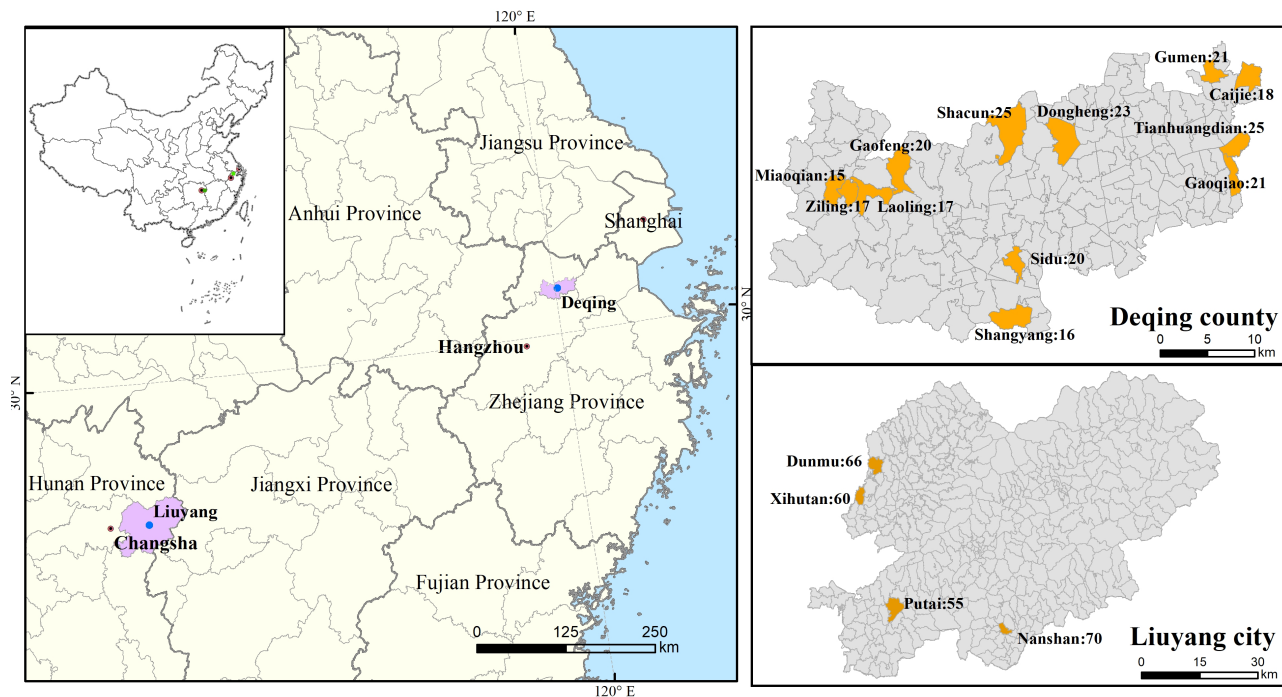


Figure 2. Location of the study area.

Deqing County, Zhejiang Province, is located in the hinterland of the Yangtze River Delta and is an important node county in the Hangzhou Metropolitan Area, with a total area of 936 square kilometers, of which rural land accounts for 107.1 square kilometers. It has 1881 rural collective commercial construction land, covering an area of 10,691 mu. In 2019, Deqing County had a registered population of 443,000 and a permanent population of 650,000. The county achieved a GDP of 53.70 billion, and per capita GDP was CNY 82,600. The three-industry structure was 4.6:58.6:36.8. The per capita disposable income of residents was CNY 49,000, of which the per capita disposable income of urban permanent residents was CNY 59,000. A total of 27,000 new jobs were created, and the registered urban unemployment rate was 1.87%.

Liuyang City is a county-level city under the jurisdiction of Hunan Province and is managed by Changsha City. It is located on the border of Hunan and Jiangxi, with a total area of 5007.75 square kilometers, of which urban construction land accounts for 23.68 square kilometers and rural construction land 322.32 square kilometers. It has 1320 rural collective commercial construction land, covering an area of 11,550 mu. In 2019, Liuyang had a registered population of 1,491,300. The gross production value was CNY 94,500. The three-industry structure was 7.7:50.8:41.5. The per capita disposable income of residents was CNY 43,000, of which the per capita disposable income of urban residents was CNY 50,000. A total of 15,000 new jobs were created, and the registered urban unemployment rate was 2.89%.

3.2. Data Sources

The data in this study are the micro-farmer household data collected by the author and team members in Liuyang, Hunan Province and Deqing, Zhejiang Province in July and September 2021, respectively. According to the participation of each village in the transfer of rural collective construction land, 4 villages were selected for investigation in Liuyang, which were Nanshan Village in the south, Putai Village in the southwest, Xihutan Village in the west, and Dunmu Village in the north. The eastern villages were not selected as the survey area because the eastern part of Liuyang is mainly forest. In Deqing, four villages were selected for research in the eastern plains, the central hills, and the western mountains, which were Gumen Village, Caijie Village, Tianhuangdian Village, and Gaoqiao

Village in the east, Shacun, Dongheng Village, Sidu Village and Shangyang Village in the center, and Miaoqian Village, Ziling Village, Laoling Village and Gaofeng Village in the west. Since there are fewer peasant households in each village in Deqing than in Liuyang, more villages had participated in the transfer of rural collective land use rights than in Liuyang, and the topography and economic development patterns of villages in the same area of Deqing were similar. Therefore, several villages were selected from the east, west and center of Deqing for investigation. The investigators conducted the survey through face-to-face interviews with the respondents, and the survey object was the head of the farmer household.

A total of 520 questionnaires were collected in this study, including 264 in Liuyang, Hunan and 256 in Deqing, Zhejiang. After excluding unreasonable and incomplete questionnaires, a total of 489 valid questionnaires were collected, including 251 in Liuyang, Hunan and 238 in Deqing, Zhejiang. The effective response rate of the questionnaire was 94.04%. The number and total ratio of the surveyed farmer households in each village are shown in Table 1. *n* is the number of farmer households surveyed, *N* is the total number of farmer households in each village. Total ratio is the number of surveyed farmer households divided by the total number of that in each village.

Table 1. Sample size and total ratio of each village.

Area	Village	<i>n</i>	<i>N</i>	Total Ratio
Liuyang City	Nanshan	70	871	8.04%
Liuyang City	Putai	55	1482	3.71%
Liuyang City	Xihutan	60	887	6.76%
Liuyang City	Dunmu	66	985	6.70%
Deqing County	Gumen	21	622	3.38%
Deqing County	Caijie	18	519	3.47%
Deqing County	Tianhuangdian	25	580	4.31%
Deqing County	Gaoqiao	21	603	3.48%
Deqing County	Shangyang	16	407	3.93%
Deqing County	Sidu	20	480	4.17%
Deqing County	Dongheng	23	650	3.54%
Deqing County	Shacun	25	673	3.71%
Deqing County	Laoling	17	387	4.39%
Deqing County	Miaoqian	15	279	5.38%
Deqing County	Gaofeng	20	419	4.77%
Deqing County	Ziling	17	328	5.18%

To reduce the hypothetical bias of the choice experiment, cheap talk scripts were used to encourage the interviewed farmers to provide real answers [45]. The details are as follows: “Although the conditions we describe now are not real and we do not ask you to take any action, you must also choose as a real situation. Please think carefully about whether you will do what you say when you encounter the same situation in the future. This is important.” [46]. The investigator first asked the farmers several questions related to rural land to bring them into the situation, then introduced the purpose of the experiment, and explained in detail the attributes and levels of the IDS and the selection method. After the interviewed farmers indicated that they understood the meaning, the investigator presented the three choices to the interviewed farmers in turn in the form of scenario cards, allowing the farmers to make a choice.

Cronbach’s α coefficient method was used to test the reliability of the data. The reliability test results showed that Cronbach’s alpha was 0.853, indicating that the reliability and consistency of the questionnaire data were high. Then, the Kaiser–Meyer–Olkin value and Bartlett’s sphericity test were used to measure the validity of the questionnaire data. The test results showed that the KMO value of the questionnaire data was 0.751, the approximate chi-square value of the spherical test was 10,210.760, and the corresponding

p value was 0.000, which indicates that the validity of the questionnaire data is high, and the data are able to accurately reflect farmers' preference for attributes of IDS.

A total of 520 questionnaires were collected in this study, including 264 in Liuyang, Hunan and 256 in Deqing, Zhejiang. After excluding unreasonable and incomplete questionnaires, a total of 489 valid questionnaires were collected, including 251 in Liuyang, Hunan and 238 in Deqing, Zhejiang. The effective response rate of the questionnaire was 94.04% (Figure 2).

3.3. Methods

The declarative preference method was used to assess the subjects' preference for the research subjects, including the contingent valuation method (CVM) and choice experiment. CVM uses heuristic questionnaires to directly ask the respondents about the situation assumed in the questionnaire in order to understand their preference, which has certain limitations, including hypothetical bias, elicitation technique bias, and strategic bias. The choice experiment method involves systematically setting up a series of choice occasions of different levels related to the characteristics of the research object, whereby the respondents choose their preferred scheme for each different choice occasion. This enables researchers to evaluate multiple properties of a protocol through a single choice experiment design. Most importantly, the choice experiment method is able to eliminate or reduce the elicitation technique bias and strategic bias present in CVM. Therefore, the choice experiment was used to study the preference of farmers with respect to the IDS.

3.3.1. Experimental Design

To determine the attributes of the IDS for the transfer of rural collective land use rights, pre-investigation was conducted in Liuyang City, Hunan Province and Yucheng City, Shandong Province in August and October 2020. The pre-investigation was carried out through face-to-face interviews with the natural resource bureaus of the counties (cities), the natural resource management offices of the towns (sub-districts), and local farmers. Based on the interview and expert consultations collected in the pre-investigation area, combined with our collection of income distribution method for the transfer of rural collective construction land use rights in each county (city, district), finally, the attributes of the IDS were determined as the following five types: average annual income, income distribution ratio, shareholding ratio, cash ratio and pension insurance. The key attributes and levels are shown in Table 2.

Table 2. Attributes and levels of the IDS.

Attribute	Description	Level
Average annual income	Annual income per mu of land	CNY 1000, 2000, 3000, 4000 /CNY 3000, 4000, 5000, 6000
Income distribution ratio	The income distribution ratio of farmers among farmers, the local government and the village collective	0–25%, 25–50%, 50–75%, 75–100%
Shareholding ratio	Proportion of shareholding in farmers' income	0–25%, 25–50%, 50–75%, 75–100%
Cash ratio	Proportion of cash in farmers' income	0–25%, 25–50%, 50–75%, 75–100%
Pension	Whether there is pension in the form of income	Yes, No (binary variable)

“Average annual income” refers to the income that farmers can obtain per mu (Mu is a unit of land area in China, and one mu is about 666.667 square meters.) each year when they participate in the transfer of rural collective land use rights. The prices of rural collective land in different regions are different. Therefore, the average annual income obtained by farmers in each region by participating in the transfer of rural collective land use rights is also different. The “average annual income” is determined based on the economic level of the region, the average transfer price of cultivated land, and interviews with farmers. In Liuyang City, the attribute level of “average annual income” is set to CNY 1000, 2000, 3000,

and 4000; in Deqing County, the “average annual income” is set to CNY 3000, 4000, 5000, and 6000.

“Income distribution ratio” refers to the income distribution ratio of farmers among the government, village collectives, and individuals. After participating in the transfer of rural collective land use rights, the government will extract part of the proceeds from the total land transfer income as an adjustment fund, and the village collective will also withdraw a certain percentage of the proceeds to strengthen the collective economy. In interviews with farmers, most farmers believed that the rural land belonged to them, and that the proceeds from the transfer of land use rights should belong to the farmers. According to the collected management measures or guidance, we found that the income distribution ratio in different regions varied greatly. In Yujiang District of Jiangxi Province, it was as high as 80% to 90%; in Deqing County of Zhejiang Province, it was 46% to 75%; in Wenchang City of Hainan Province and Jinjiang City of Fujian Province, it is about 50% to 60%; in Longxi County, Gansu Province, it was as low as 20%. Based on this, we set the “income distribution ratio” as one of the attributes, and determined four levels—0–25%, 25–50%, 50–75%, 75–100%—according to the government adjustment fee collection ratio and the village collective retention ratio.

“Shareholding ratio” refers to the proportion of the income to farmers that is used to invest in land use enterprises or the collective village economy. For example, in September 2017, the right to use rural collective land of 354 mu in Xihutan Village, Yong’an Town, Liuyang City was transferred to the enterprise, and the farmers’ income was paid in the form of dividends [39]. According to the collected cases, it was a common and accepted form for farmers to distribute income through share dividends. However, in the interview, some farmers indicated that share dividends have a certain degree of instability, so a proportion of shares should be set to reduce the risk to their future land income. Based on this, the levels were determined as 0–25%, 25–50%, 50–75% and 75–100%.

“Cash ratio” refers to the amount of income paid to farmers in the form of cash in the income obtained by rural households from the transfer of rural collective land use rights. In interviews with farmers in Jinkou Village, Guankou Street, Liuyang City, most farmers indicated that they were more willing to receive more income as a one-time cash payment. There are many farmers going out to start businesses. On the whole, they have a higher appetite for risk, and they are more willing to use the cash income obtained for investment or entrepreneurship in order to obtain higher returns. Similarly, the levels were determined as 0–25%, 25–50%, 50–75% and 75–100%.

“Pension” refers to income obtained by farmers in the form of endowment insurance by participating in the transfer of rural collective land use rights. In September 2021, in an interview with relevant staff involved in the transfer of rural collective land use rights at the Deqing County Agriculture and Rural Bureau, it was expressed that farmers were willing to receive their income in the form of pension, and the departments involved in the relevant process were sorting this out. According to the social security system in China, there are several fixed pension payment standards for farmers to choose. Therefore, we set the “pension” attribute to two levels: yes and no.

The choice set was composed of multiple choice occasions, and a choice occasion was generally composed of 3 or 4 alternatives. According to the attributes and levels determined in Table 1, there are a total of 512 ($4^4 \times 2$) IDSs. Taking into account the feasibility and scientific nature of the scheme, SPSS and partial factor orthogonal design were used to eliminate the alternatives that did not correspond to the actual situation and the optimal choice, and finally determined 18 IDSs. According to the principle of attribute level balance and minimum overlap, we divided these 18 IDSs into 3 choice sets. Each choice set was a questionnaire (a total of 3 questionnaires). Each questionnaire contained 3 selection scenarios. Each choice occasion was composed of 2 options for IDSs and 1 option for “status quo”. An example of one of the choice occasions is shown in Table 3. For each choice occasion, the interviewed farmers made a choice among 3 options according to their own

wishes. If the interviewed farmers chose scheme 1, this meant that the utility of choosing scheme 1 was greater than that of choosing schemes 2 or 3.

Table 3. An example of a choice occasion for the IDSs.

Attribute	Scheme 1	Scheme 2	Scheme 3
Average annual income (CNY per mu per year)	2000	3000	Status quo
Income distribution ratio	25–50%	25–50%	
Shareholding ratio	50–75%	0–25%	
Cash ratio	0–25%	75–100%	
Pension	Yes	No	
Please choose one(Tick “√” under the selected scheme)			

3.3.2. Econometric Model Construction

According to the Lancasterian Economic Theory of Value, the utility of a commodity comes from its attributes [47], that is, the utility of a commodity consists of all its attribute values. Suppose that farmer i chooses plan j from J IDSs, and the utility obtained is U_{ij} . When faced with a choice set consisting of multiple independent schemes, farmers will choose a scheme with a combination of attributes that maximizes their utility. According to the random utility theory [48], the utility of an individual consists of a certain part and a random part, and then:

$$U_{ij} = V_{ij}(X_{ij}, \beta_{ij}) + \varepsilon_{ij} = \beta_{ij}^1 x_{ij}^1 + \beta_{ij}^2 x_{ij}^2 + \cdots + \beta_{ij}^g x_{ij}^g + \varepsilon_{ij} (i = 1 \cdots n, j = 1 \cdots m) \quad (1)$$

where V_{ij} is the observable utility, X_{ij} is the various attributes in the IDS, x_{ij}^g represents the value of attribute g in scheme j , and β_{ij}^g is the influence coefficient of attribute g on the observable utility of farmer i . ε_{ij} is a random error term, which represents the impact of unobservable factors on the utility to farmers. If the random error term ε_{ij} obeys independent identical distribution (IID) and type I extreme value distribution, the probability that farmer i chooses j is the conditional Logit model. Assuming that the observable utility V_{ij} is the marginal utility vector of the attribute, then:

$$V_{ij} = ASC_i + \beta_k x_k \quad (2)$$

(2) is the basic model of conditional Logit, where ASC_i is a constant term, which represents the benchmark utility of farmer i 's choice of “status quo” [49], and x_k and β_k are the attribute variables and their coefficients, respectively. The conditional Logit model is based on the assumption that there is no difference in the preferences of farmers. In fact, the preferences of farmers with different characteristics on the attributes and levels of the IDS are heterogeneous. The random parameter Logit model breaks through this limitation. This paper uses 150 Halton sampling to estimate the maximum likelihood of the random parameter Logit model. Through continuous debugging, it was found that only when the “income distribution ratio” is a random parameter, is its standard deviation coefficient significant. Therefore, the “income distribution ratio” is determined as a random parameter, and other variables are set as fixed parameters. The random utility of farmer i 's choice for scheme j is:

$$U_{ij} = \alpha_i x_{ij} + \delta y_{ij} + ASC + \varepsilon_{ij} \quad (3)$$

where α_i are random coefficients that vary between individuals, and x_{ij} is a vector of attribute variables, δ are fixed coefficients on y_{ij} , a vector of attribute variables. ASC_i is a constant term, and represents the benchmark utility of farmer i 's choice of “status quo”. ε_{ij} is a random term that follows a type I extreme value distribution.

The choice probabilities are the standard logistic probabilities integrated over the density $f(\beta)$. From this, the unconditional probability that farmer i chooses scheme j is:

$$P_{ij} = \int \frac{\exp(\alpha_i x_{ij} + \delta x y_{ij} + ASC + \varepsilon_{ij})}{\sum_{j=1}^J \exp(\alpha_i x_{ij} + \delta x y_{ij} + ASC + \varepsilon_{ij})} f(\beta) d\beta \quad (4)$$

According to the analysis above, in the final 18 IDSs, the attributes of “shareholding ratio” and “cash ratio” may have a negative correlation. That is, when the total income is constant, the higher the proportion of shares, the lower the proportion of cash, and the higher the proportion of cash, the lower the proportion of shares. Therefore, in order to avoid the collinearity between the attribute variables, the “shareholding ratio” and “cash ratio” are separately considered in the model.

When each segment of the income distribution ratio, shareholding ratio, and cash ratio is added to the model for estimation, since they are set as dichotomous dummy variables and ASC is also a dichotomous dummy variable, there is serious collinearity between each segment of income distribution ratio, shareholding ratio and cash ratio and ASC, which causes ASC to be omitted in the estimation, and the result cannot be estimated. Moreover, the estimation results of ASC only reflect the benchmark utility of not participating in the transfer of rural construction land use rights, and have no practical significance for the discussion of the IDS. Therefore, we did not take ASC into account in the subsequent parameter estimation.

To verify farmers’ preferences for the level of each attribute, this paper estimates their preferences for annual average income, income distribution ratio, shareholding ratio and cash ratio separately. In the model for estimating their preference for income distribution ratio, its multiple levels are used as explanatory variables. So does the model for estimating the shareholding ratio or cash ratio.

3.4. Variables

The dependent variable in our study is “whether a scheme in the choice occasion is selected”. The dependent variable equal to 1 identifies the chosen alternatives, whereas a 0 indicates the alternatives that were not chosen. ASC is the alternative specific constant, and represents the benchmark utility for farmers to choose “Status quo”. If the farmer chooses one of the schemes in the choice occasion, “Status quo” is defined as 0, otherwise, it is defined as 1, which means that the farmer chose to maintain the status quo, that is, under such a choice occasion for IDSs, they would prefer not to participate in the transfer of collective construction land use rights. The core independent variables of the model are scheme attribute variables, including annual average income, income distribution ratio, shareholding ratio, cash ratio, and pension. Among them, the average annual income is a continuous variable. In Liuyang City, 1, 2, 3, and 4, respectively, represent CNY 1000, 2000, 3000, and 4000; in Deqing, 1, 2, 3, and 4, respectively, represent CNY 3000, 4000, 5000, 6000. Attribute variables of income distribution ratio, shareholding ratio, and cash ratio are divided into four grades, specifically, 0 to 25%, 25% to 50%, 50% to 75%, and 75% to 100%. When estimating the impact of income distribution ratio, shareholding ratio and cash ratio on farmer willingness, we take the upper limit of each interval for parameter estimation, that is, 25, 50, 75, and 100%; when estimating the impact of the level of the above attributes on farmer willingness, we regard each level as a dichotomous dummy variable. For example, income distribution ratio of 0 to 25% is a dichotomous dummy variable; if the income distribution ratio of the scheme selected by the farmer is 0 to 25%, it is set to “1”; otherwise, it is set to 0. Pension is a dichotomous dummy variable; if there is pension in the IDS, it is set to “1”; otherwise, it is set to “0”. The meaning and descriptive statistics of these variables are shown in Table 4.

Table 4. Variable description and summary.

Variables	Description	Total	Liuyang		Deqing	
		Mean	Mean	Sd	Mean	Sd
Whether a scheme is selected	the scheme is selected = 1, the scheme is not selected = 0	0.33	0.33	0.47	0.33	0.47
Constant term (ASC)	status quo = 1, choose scheme 1 or scheme 2 = 0	0.33	0.33	0.47	0.33	0.47
Average annual income	use 1, 2, 3, 4 to represent the four levels of income	1.63	1.63	1.47	1.63	1.47
Income distribution ratio	take the upper limit of each interval of 25, 50, 75, 100 to represent the value; unit: %	43.14	43.66	37.78	42.58	37.00
0 to 25%	yes = 1, no = 0	0.11	0.33	0.47	0.33	0.47
25% to 50%	yes = 1, no = 0	0.24	0.11	0.31	0.11	0.31
50% to 75%	yes = 1, no = 0	0.14	0.22	0.41	0.25	0.43
75% to 100%	yes = 1, no = 0	0.18	0.14	0.35	0.13	0.34
Shareholding ratio	take the upper limit of each interval of 25, 50, 75, 100 to represent the value; unit: %	33.85	33.44	31.20	34.27	31.86
0 to 25%	yes = 1, no = 0	0.25	0.25	0.43	0.24	0.43
25% to 50%	yes = 1, no = 0	0.23	0.23	0.42	0.23	0.42
50% to 75%	yes = 1, no = 0	0.11	0.11	0.31	0.11	0.31
75% to 100%	yes = 1, no = 0	0.08	0.07	0.26	0.08	0.28
Cash ratio	take the upper limit of each interval of 25, 50, 75, 100 to represent the value; unit: %	33.81	34.26	32.11	33.32	31.36
0 to 25%	yes = 1, no = 0	0.26	0.26	0.44	0.27	0.44
25% to 50%	yes = 1, no = 0	0.19	0.18	0.39	0.20	0.40
50% to 75%	yes = 1, no = 0	0.13	0.15	0.35	0.12	0.33
75% to 100%	yes = 1, no = 0	0.08	0.08	0.27	0.07	0.26
Pension	yes = 1, no = 0	0.37	0.38	0.48	0.37	0.48

Note: Number of observations is 4401 (Since each of the 489 farmers had to make a choice in three selection scenarios (one questionnaire contains three selection scenarios), there are 4401 ($489 \times 3 \times 3$) data points), number of observations in Liuyang is 2259 (there were 251 and 238 interviewed farmers in Liuyang and Deqing, respectively, and each farmer made three choices, so there were 2259 and 2142 data points in Liuyang and Deqing, respectively.), number of observations in Deqing is 2142.

4. Results

4.1. Farmers' Preferences for Annual Average Income and Income Distribution Ratio

4.1.1. Overall Estimation Results

To obtain farmers' preference for income distribution ratio, this paper conducts random parameter Logit estimation of different income distribution ratios, and the estimated results are shown in Table 5.

Model T1 is the random parameter Logit model when the shareholding ratio is added, and model T2 is the random parameter Logit model when the cash ratio is added. From the estimation results of model T1 and model T2, it can be seen that the attribute of "average annual income" does not significantly affect the willingness of farmers to participate in the transfer of rural collective construction land use rights.

The attribute variable of "income distribution ratio" is significant, and the coefficient is positive. For both model T1 and model T2, income distribution ratio of 0 to 25%, 25% to 50%, 50% to 75%, 75% to 100% are all significant at the 1% statistical level, and the coefficients are all positive. The coefficients for the income distribution ratio of 50% to 75% are much higher than the coefficients for the income distribution ratio of 0 to 25%, 25% to 50%, 75% to 100%, which means that on the whole, the scheme with the income distribution ratio of 50% to 75% can bring greater utility to farmers, and farmers are more inclined to choose the IDS with the income distribution ratio of 50% to 75%. Judging from the standard deviation of random parameters, the coefficient of income distribution ratio

of 0 to 25%, 25% to 50%, 50% to 75%, 75% to 100% are also significant at the 1% statistical level, which shows that farmers with different characteristics have different preferences for the income distribution ratio.

Table 5. Estimation results of random parameter Logit model based on total sample under different income distribution ratio.

Variables	Model T1	Model T2
	Shareholding Ratio	Cash Ratio
Fixed parameter		
Average annual income	−0.027 (−0.28)	0.076 (0.70)
Shareholding ratio or cash ratio	0.003 (0.62)	0.006 ** (2.07)
Pension	1.303 *** (5.88)	1.675 *** (7.91)
Random parameter		
Income distribution ratio of 0 to 25%	2.258 *** (3.17)	1.934 *** (2.78)
Income distribution ratio of 25% to 50%	1.997 *** (3.58)	1.673 *** (3.30)
Income distribution ratio of 50% to 75%	4.810 *** (3.90)	4.575 *** (4.07)
Income distribution ratio of 75% to 100%	2.614 *** (2.90)	2.397 *** (2.98)
Standard deviation of random parameter		
Income distribution ratio of 0 to 25%	5.425 *** (3.24)	5.054 *** (3.66)
Income distribution ratio of 25% to 50%	2.065 *** (5.12)	2.216 *** (5.86)
Income distribution ratio of 50% to 75%	5.708 *** (3.98)	5.536 *** (5.33)
Income distribution ratio of 75% to 100%	3.145 *** (4.07)	3.603 *** (5.83)
Chi squared	102.10	136.75
Log likelihood	−1137.259	−1131.333
Number of observations	4401	

Note: ** and *** indicate significance at the level of 5% and 1% respectively; Z values in parentheses.

4.1.2. Group Estimation Results

According to the results of the descriptive statistical analysis described above, it is necessary to conduct group estimation on Liuyang and Deqing. To further investigate the preference of farmers in Liuyang and Deqing for different income distribution ratios, this paper conducts random parameter Logit estimation of different income distribution ratios based on grouped samples, and the estimated result is shown in Table 6.

Model L1 and model L2 are the random parameter Logit model with Liuyang as a sample when the shareholding ratio and cash ratio are added, respectively. Model D1 and model D2 are the random parameter Logit model with Deqing as a sample when the shareholding ratio and cash ratio are added, respectively. The estimation results in Table 5 show that the “average annual income” is not significant, which shows that the income that can be obtained by participating in the marketization of rural collective land has no significant impact on the utility to farmers, that is, the “average annual income” does not significantly affect the probability of farmers participating in the marketization of rural collective land. This is similar to the estimation result of the total sample, which also shows the robustness of the estimated results.

Table 6. Random parameter Logit model estimation results based on group samples under different income distribution ratio.

Variables	Liuyang		Deqing	
	Model L1	Model L2	Model D1	Model D2
	Shareholding Ratio	Cash Ratio	Shareholding Ratio	Cash Ratio
Fixed parameter				
Average annual income	−0.0833 (−0.64)	0.0071 (0.04)	0.0162 (0.11)	0.1511 (0.96)
Shareholding ratio or cash ratio	0.0087 * (1.68)	0.0027 (0.68)	−0.011 (−1.11)	0.007 ** (1.99)
Pension	1.142 *** (3.94)	1.656 *** (5.37)	1.689 *** (4.02)	1.622 *** (5.40)
Random parameter				
Income distribution ratio of 0 to 25%	2.021 *** (3.50)	2.407 *** (2.69)	2.635 (1.61)	1.090 (0.75)
Income distribution ratio of 25% to 50%	1.642 *** (3.56)	1.931 *** (2.97)	4.223 ** (2.56)	2.234 ** (2.24)
Income distribution ratio of 50% to 75%	3.425 *** (4.22)	4.419 *** (3.30)	7.854 *** (2.69)	6.101 ** (2.17)
Income distribution ratio of 75% to 100%	1.954 *** (2.81)	2.777 *** (2.65)	4.282 * (1.88)	2.114 (1.34)
Standard deviation of random parameter				
Income distribution ratio of 0 to 25%	1.657 * (1.82)	2.146 ** (2.07)	17.296 ** (2.20)	13.502 ** (2.45)
Income distribution ratio of 25% to 50%	0.976 ** (2.08)	1.480 *** (3.16)	4.077 *** (3.67)	3.370 *** (3.83)
Income distribution ratio of 50% to 75%	2.634 *** (3.72)	3.843 *** (3.57)	9.716 *** (3.68)	10.815 *** (2.70)
Income distribution ratio of 75% to 100%	2.298 *** (3.72)	3.558 *** (4.48)	4.631 ** (2.50)	3.882 *** (2.66)
Chi squared	35.12	58.00	78.42	89.26
Log likelihood	−519.947	−520.855	−594.468	−591.326
Number of observations	2259		2142	

Note: *, ** and *** indicate significance at the level of 1%, 5% and 10% respectively; Z values in parentheses.

According to the estimation results in Table 6, it can be seen that in Liuyang, the variable “income distribution ratio” is significant at the level of 1%, the coefficient is positive. The coefficient of income distribution ratio of 50% to 75% is significantly higher than that of 0 to 25%, 25% to 50%, and 75% to 100%, which shows that farmers in Liuyang are more inclined to choose the scheme with the income distribution ratio of 50% to 75%. According to the estimation results of Models D1 and D2, in Deqing, when the shareholding ratio is included in the model, the income distribution ratios of 25% to 50%, 50% to 75%, and 75% to 100% are significant, and the coefficients are positive; when the cash ratio is included in the model, the income distribution ratios of 25% to 50% and 50% to 75% are significant, and the coefficient of the income distribution ratio of 50% to 75% is much higher than that of that of 25% to 50%. This shows that farmers in Deqing are also more inclined to choose the scheme with the income distribution ratio of 50% to 75%. From the standard deviation of the random parameters, the coefficient value of the income distribution ratio of 50% to 75% is larger and statistically significant, which indicates that whether in Deqing or in Liuyang, farmers’ preferences for the income distribution ratio are quite different.

4.2. Farmers’ Preferences for Shareholding Ratio and Cash Ratio

4.2.1. Overall Estimation Results

To further test farmers’ preference for different levels of shareholding ratio or cash ratio, we introduce different levels of shareholding ratio and cash ratio as explanatory variables for estimation. The estimated results are shown in Table 7. Model T3 is a random parameter Logit model under different shareholding ratios, and model T4 is a random parameter Logit model under different cash ratios.

Table 7. Estimation results of random parameter Logit model based on total sample under shareholding ratio or cash ratio.

Variables	Model T3	Model T4
	Shareholding Ratio	Cash Ratio
Fixed parameter		
Average annual income	0.204 *** (2.61)	0.342 *** (3.88)
Shareholding ratio or cash ratio of 0 to 25%	1.432 *** (5.06)	0.873 *** (2.75)
Shareholding ratio or cash ratio of 25% to 50%	0.826 *** (2.67)	1.081 *** (3.76)
Shareholding ratio or cash ratio of 50% to 75%	1.370 *** (4.66)	1.018 *** (3.16)
Shareholding ratio or cash ratio of 75% to 100%	1.236 *** (3.72)	1.199 *** (3.95)
Pension	1.219 *** (9.82)	1.558 *** (11.79)
Random parameter		
Income distribution ratio	0.015 *** (4.44)	0.011 *** (3.53)
Standard deviation of random parameter		
Income distribution ratio	0.036 *** (10.43)	0.037 *** (10.82)
Chi squared	138.92	156.81
Log likelihood	−1122.436	−1123.958
Number of observations	4401	

Note: *** indicate significance at the level of 5% and 1% respectively; Z values in parentheses.

The results of models T1 and T2 show that the variable of shareholding ratio based on the full sample has no significant impact on the willingness of farmers to participate in the transfer of rural collective construction land use rights. However, the variable of cash ratio is significant at the 5% level. This shows that on the whole, when the payment mode of the income includes the form of payment in cash, it can significantly increase the utility to farmers, thereby increasing the probability of farmers choosing to participate. However, the payment mode of shareholding in the IDS cannot significantly enhance the willingness of farmers to participate.

It should be noted that the variables of annual average income in Table 6 are all significant at the level of 1%, while in Table 5, the variables of annual average income are not significant, and the coefficient is smaller than that of the average annual income in Table 7. This may be because the influence of the average annual income on the probability of farmers choosing to participate in a certain scheme partly comes from the mediating effect of the average annual income on the income distribution ratio, which leads to the fact that after including the average annual income and income distribution ratio in the model in Table 5 at the same time, the effect of the annual average income on farmer willingness to participate is offset, so the variable of annual average income is not significant.

From the estimation results of model T3 and model T4, it can be seen that the cash ratio or shareholding ratio of 0 to 25%, 25% to 50%, 50% to 75%, and 75% to 100% is significant at the 1% level, and the coefficient is positive. In the model including the “shareholding ratio”, the coefficient of the shareholding ratio of 0 to 25% is the largest, which means that when part of the income of farmers is paid in the form of dividends, the scheme with a shareholding ratio of 0 to 25% can bring greater utility to farmers. However, the shareholding ratio is not significant in model T1, which indicates that the willingness of farmers to participate in the transfer of rural collective land use rights does not change with the change of shareholding ratio. Based on the above analysis, we can conclude that when part of the income of farmers is distributed in the form of shares, farmers are more willing to choose the IDS with a shareholding ratio of 0 to 25%. In the model including the

“cash ratio”, the coefficient of the cash ratio of 75% to 100% is the largest compared to other levels of it, which means the IDS with a cash ratio of 75% to 100% can bring the greatest utility to farmers. The analysis results of model T2 also show that with the increase of cash ratio, the willingness of farmers to choose to participate in the transfer of rural collective land use rights gradually increases. Therefore, when the IDS of the farmers clearly has part of the income paid in cash, farmers are more inclined to choose the IDS with a cash ratio of 75% to 100%.

4.2.2. Group Estimation Results

According to the estimation results in Table 6, in Liuyang, the variable of cash ratio is not significant, and the variable of shareholding ratio is significant at the level of 5%. It indicates that the proportion of farmers' income paid in cash does not significantly affect farmer willingness to participate in the transfer of rural land use rights, while the proportion of income to be used for shareholding significantly affects their utility, which in turn affects their willingness to participate in the transfer of rural land use rights. In contrast, in Deqing, the variable of cash ratio is significant at the 5% statistical level, while the variable of shareholding ratio is not significant. Therefore, farmers in Liuyang prefer the income payment mode including shareholding, and farmers in Deqing prefer the income payment mode including cash. According to the surveys in Deqing and Liuyang, this may be because compared with Liuyang, Deqing has a more active private economy, more village-run enterprises, and more farmers who start their own businesses. They prefer to obtain more cash at one time for self-investment in order to obtain higher profits.

The estimated results of the random parameter Logit model based on the different shareholding ratios or cash ratios of the grouped samples are shown in Table 8. Model L3 and model L4 are random parameter Logit models with Liuyang as a sample including shareholding ratio and cash ratio, respectively; model D3 and model D4 are the random parameter Logit models with Deqing as the sample, including the shareholding ratio and cash ratio, respectively. The estimation results of model L3 show that the shareholding ratios are all significant at the level of 1%, the coefficient is positive, and the overall trend is increasing. This means that a scheme with a higher shareholding ratio can bring greater utility to farmers. Therefore, the IDS with a shareholding ratio of 75% to 100% can bring maximum utility to farmers in Liuyang. The results in model L4 show that the cash ratios are all significant at the 1% level, and the coefficient sign is positive. Compared with other level of cash ratio, the coefficient of the cash ratio of 75% to 100% is largest and the coefficient of 50% to 75% of it is smallest, which indicates the IDS with a cash ratio of 75% to 100% can bring maximum utility to farmers in Liuyang. Comparing the results of model L3 and model L4, it can be seen that the coefficient of shareholding ratio of 75% to 100% is the largest. Therefore, the income distribution plan with a shareholding ratio of 75% to 100% can best enhance the willingness of farmers in Liuyang to participate.

The estimation results based on Deqing in model D3 and model D4 show that the shareholding ratios of 0 to 25% and 50% to 75% are statistically significant and the coefficients are positive, and the coefficients of the shareholding ratios of 50% to 75% are lower than that of 0 to 25%. This shows that when part of the income is paid to farmers in the form of shares, the scheme with a shareholding ratio of 0 to 25% can bring the greatest utility to farmers in Deqing. Therefore, farmers in Deqing prefer to choose a scheme with a shareholding ratio of 0 to 25%. Although the cash ratios of 0 to 25%, 25% to 50%, 50% to 75%, and 75% to 100% have no significant effect on the probability of farmers choosing to “participate”, the coefficient of cash ratio generally shows an upward trend. Moreover, according to the estimation results of model D2 in Table 6, the cash ratio is significant at the level of 5%, which shows that when it is determined that part of the income is paid in cash, farmers in Deqing prefer the scheme with a higher proportion of cash.

Table 8. Estimation results of random parameter Logit model based on group samples under shareholding ratio or cash ratio.

Variables	Liuyang		Deqing	
	Model L3	Model L4	Model D3	Model D4
	Shareholding Ratio	Cash Ratio	Shareholding Ratio	Cash Ratio
Fixed parameter				
Average annual income	0.070 (0.62)	0.195 (1.49)	0.308 *** (2.82)	0.477 *** (3.90)
Shareholding ratio or cash ratio of 0 to 25%	2.286 *** (4.70)	1.997 *** (3.74)	0.939 *** (2.61)	0.127 (0.31)
Shareholding ratio or cash ratio of 25% to 50%	1.754 *** (3.24)	1.965 *** (3.99)	0.315 (0.81)	0.552 (1.51)
Shareholding ratio or cash ratio of 50% to 75%	2.353 *** (4.71)	1.938 *** (3.60)	0.819 ** (2.17)	0.428 (1.03)
Shareholding ratio or cash ratio of 75% to 100%	2.587 *** (4.41)	2.153 *** (4.24)	0.425 (1.02)	0.504 (1.26)
Pension	1.236 *** (6.82)	1.601 *** (8.15)	1.169 *** (6.73)	1.482 *** (8.15)
Random parameter				
Income distribution ratio	0.014 *** (2.83)	0.012 *** (2.69)	0.014 *** (2.89)	0.009 ** (2.01)
Standard deviation of random parameter				
Income distribution ratio	0.034 *** (6.28)	0.037 *** (6.92)	0.038 *** (8.03)	0.037 *** (8.17)
Chi squared	42.15	56.43	93.82	96.70
Log likelihood	−520.318	−524.307	−587.575	−585.870
Number of observations	2259		2142	

Note: ** and *** indicate significance at the level of 5% and 1%, respectively; Z values in parentheses.

4.3. Farmers' Preferences for Pension

The estimation results in Tables 5–8 show that regardless of whether the analysis is based on the total sample or the grouped sample, the variable of pension is significant at the 1% level, and the coefficient is positive, which shows that farmers in both Liuyang and Deqing prefer the payment mode of “pension” included in the IDS. Therefore, in general, farmers prefer IDSs that include pension, and in terms of grouping, farmers in Liuyang and Deqing also prefer IDSs with pension.

5. Discussion

5.1. Comparison with Existing Research

Taking the transfer of rural collective land use rights currently being implemented in China as an example, this paper designs a questionnaire, adopts a choice experiment method and a random parameter logistic model to analyze farmers' preferences for IDS. The findings of this paper provide a reference for improving farmer willingness to participate in the transfer of rural collective land use rights by optimizing the IDS.

Existing studies mainly focus on the preference of compensation payment modes in ecological protection, cultivated land protection, and water resources protection [28,50,51]. They draw more attention to the heterogeneity of compensation standards, participants' preferences for cash and material compensation and the reasons. This paper focuses on farmers' preference for the scheme attributes in the payment of land use rights transfer fees, especially in the case of a certain amount, their preference for the combination of attributes. The findings of this paper confirm that the security attribute in IDS is an important factor affecting farmer willingness, which are supported by our informal discussions in the field. This is also consistent with the findings of Zhenning Yu et al. [28]. In their study of fallow subsidies in Chaling County, China, they also confirmed that farmers in the fallow pilot areas prefer compensation schemes with insurance. This finding provides essential

enlightenment for optimizing the income distribution scheme of the rural collective land use rights transfer.

Existing studies explore participants' preferences for compensation payment modes in the context of ecological protection, but they do not involve the distribution of benefits among multiple stakeholders. In addition, in the study of rural collective land use rights transfer, the income distribution ratio has often been discussed from a theoretical perspective, but little analysis has been done from the perspective micro-farmers. Therefore, compared with the existing research, this paper further analyzes the farmers' preference for the income distribution ratio in IDS. This paper finds that the attribute of income distribution ratio has a more significant impact on farmers' preference for IDS than income, which also confirms the traditional Chinese view of "people worry about inequality rather than scarcity". The finding suggests that when formulating the IDS for the transfer of collective construction land use rights, not only the income of farmers should be considered, but also their income distribution ratio should be focused on to ensure their fair preference.

Studies have found that group payment of compensation is ineffective in enhancing people willingness to participate in environmental protection [46,52]. In the context of rural collective land use rights transfer, this paper considers the income distribution ratio between individual and group as an attribute of IDS, finding that group payment is not necessarily completely invalid. In addition, there may be an optimal proportion between group payment and individual payment. This study provides a new idea for discussing the compensation scheme design of community or group participation in ecological protection projects.

5.2. Policy Implications

First, the IDS for the transfer of rural collective construction land use rights should ensure a relatively fair distribution ratio between farmers and other participants [53]. This paper finds that farmers pay more attention to the proportion of income distribution than the amount of income. The income distribution ratio represents whether farmers are treated fairly in the transfer of collective land use rights. It is necessary to adhere to the market orientation of the distribution of income from the transfer of rural collective construction land use rights, protect the rights and interests of relatively disadvantaged farmers in the equal distribution, take into account fairness and efficiency, and strive to achieve an equal, just and balanced distribution of benefits among multiple subjects, so as to meet the fair preference needs of subjects. Local governments should consider the value-added income and excess profits generated by land-use enterprises' production and operation activities on rural collective land, and determine the differential adjustment fee collection ratio according to the industrial type of land-use enterprises. For enterprises with high excess profits, the proportion of adjustment fee should be moderately increased, and for enterprises with lower excess profits, the proportion of adjustment fee should be moderately reduced to ensure that farmers can share the land value-added benefits fairly.

Second, it is necessary to determine a reasonable IDS for rural collective construction land use rights transfer according to local conditions, and maximize the utility to farmers under the condition of reducing the enterprise's land use cost as much as possible, due to the regional heterogeneity of farmers' preferences for IDS. When formulating income distribution policies in different regions, it is necessary to have a deeper understanding of farmers' preferences through surveys of target farmers in order to formulate more reasonable schemes. It is found that the utility of the scheme with the same shareholding ratio and higher average annual income for farmers in Liuyang may be equal to the utility brought to the farmers in Deqing by the scheme with the same cash ratio and lower average annual income. For example, for farmers in Deqing, the IDS with lower average annual income and higher cash ratio can enhance their willingness to participate and reduce the cost of land-using enterprises, compared with the IDS with higher average annual income and higher shareholding ratio.

Third, farmers should be provided with a variety of income payment modes to enhance their willingness to participate, and at the same time the social security function of income payment should be strengthened [54]. Findings in this paper reveal that the scheme that includes pension is more likely to be selected by farmers, and a same IDS cannot meet the needs of farmers in all regions. Exploring more diversified payment modes can help enhance farmer willingness to participate and improve the implementation effect of the policy. Therefore, on the one hand, the IDS should improve the social pension security of farmers in rural areas, and also provide a higher-level pension security system integrating urban and rural areas for migrant farmers who “leave the farm but not the soil”; on the other hand, we need to innovate more diversified social security methods, such as learning from Japan’s “double-layer” security system of basic national pension and labor pension that all citizens can enjoy [55], while ensuring their expected income, and strengthening farmer willingness to participate in land transfer.

6. Conclusions

Promoting the transfer of rural land is an important way for many developing countries to improve the rural land use efficiency and develop rural economy [56–58]. China is committed to promoting rural revitalization and urban–rural integration through the reform of the rural land system. Fully allowing the direct transfer of rural construction land use rights is a breakthrough in the market-oriented reform of rural land. A reasonable IDS is the key to enhancing farmer willingness to participate in the transfer of rural construction land use rights. Existing research has theoretically studied the income distribution ratio and income payment mode based on the principal–agent relationship and the long-term utility to farmers. Studies have also drawn attention to farmers’ preference for a single attribute in the IDS. However, what about the willingness of farmers to the IDS in the transfer of rural collective construction land? How can attributes be combined at different levels to optimize IDS? There is still a lack of sufficient research. From the perspective of farmers’ preference, the choice experiment is used to formulate IDS of each attribute at different levels, so as to provide a reference for seeking the optimal IDS in the transfer of rural collective land use rights. This paper sets the income distribution ratio between group and individual in IDS, which also provides new ideas for the discussion of the effectiveness of group compensation and individual compensation. The main conclusions are as follows.

First, the findings of this paper enrich the research on the effectiveness of group compensation and individual compensation. It finds that setting a reasonable distribution ratio between collectives and individuals is helpful for increasing farmer willingness to participate, which is different from the findings of previous studies, reporting that individual compensation is effective in increasing farmer willingness while collective compensation is ineffective. A reasonable proportion of benefits is set in the collective and individual views, which provides a new idea for designing an IDS or an ecological compensation scheme. In addition, this finding also suggests that regarding the participation of farmers under collective ownership, it is not only necessary to pay attention to what farmers get, but also to pay attention to whether farmers are treated fairly. Second, social security is an important factor affecting farmers’ preference for IDS. Land is not only a factor of production for farmers, it also has a security function. This study finds that the social security attribute in IDS is essential for farmers, even more important than income, which also suggests that including the social security attribute in IDS will help significantly increase farmer willingness to participate in ecological protection projects or cultivated land protection. Third, there is obvious heterogeneity in farmers’ preference for IDS, which is consistent with existing research. Differences in the characteristics of farmers, land, regions, etc., may all lead to heterogeneity in farmers’ preferences for IDS. However, on the basis of the preliminary investigation of the relevant areas, the method designed in this paper can provide a reference for determining a reasonable IDS for the transfer of rural collective land use rights in different areas.

However, this study also has three noteworthy limitations. Firstly, due to the limitation of data availability, the original research area is limited to Liuyang and Deqing, which is unilateral. In future research, the scope can be expanded to more representative regions to further explore farmers' preferences for IDSs in different regions. Secondly, the benefits of farmers participating in the transfer of rural construction land use rights may also include employment, skills training, and housing provision, which are not included in the choice experiment scheme in this paper. We can further explore the impact of more diverse income attributes on farmer willingness to participate. Thirdly, we do not further test the influence of farmers' heterogeneity on their preference for IDSs. Based on the theoretical framework of farmers' decision-making, the impact of farmers' characteristics and regional characteristics on the choice of farmers' IDSs can be further explored.

Author Contributions: Conceptualization, L.Y., X.L., K.H. and H.L.; methodology, L.Y. and H.L.; validation, L.Y., X.L. and M.C.; formal analysis, H.L. and M.C.; investigation, L.Y., M.C. and H.L.; data curation, M.C. and H.L.; writing—original draft preparation, L.Y.; writing—review and editing, L.Y., X.L. and H.L.; visualization, L.Y. and X.L.; supervision, K.H.; funding acquisition, H.L. All authors have read and agreed to the published version of the manuscript.

Funding: This study is supported by the National Social Science Foundation of China (No.18CJY033) and the Provincial Social Science Foundation of Hunan (No.18YBQ132).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

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