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The Impact of Government Support and Social Networks on Peasants' Effective Participation in High-Standard Farmland Construction: Evidence from Yancheng City, China

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Abstract: The effective participation of peasants can raise the quality of high-standard farmland construction (HSFC) in China. How to avoid inefficient participation is an urgent issue that needs to be solved in the field of HSFC. However, the factors that influence peasants' effective participation in the HSFC remains to be further studied. This study used factor analysis and a comprehensive evaluation method to calculate social networks and the level of peasants' effective participation in HSFC based on a survey dataset of 347 peasants in Yancheng City, China. The influence of information support, incentive support, constraint support, network interaction, network trust, and network norms on the level of peasants' effective participation in HSFC was analyzed using an ordered logistic model. The results of the study indicate that: (1) The overall level of peasants' effective participation in the HSFC is at a "medium" level, and the level of peasants' effective participation needs to be further raised. (2) Government support considerably influences peasants' effective participation in HSFC. Information support, incentive support, and constraint support significantly impact peasants' effective participation in HSFC. (3) Social networks possess a significant positive impact on the level of peasants' effective participation in HSFC, with the core variables contributing to peasants' effective participation in the order of network interaction, network trust, and network norms. (4) Peasants' cognition significantly impacts peasants' effective participation in HSFC. Therefore, to enhance the level of peasants' effective participation in HSFC, it is suggested to further improve government information support, incentive support, and constraint support; strengthen network interaction, enhance network trust, improve network norms, and effectively play the role of social networks; and to strengthen peasants' education and training.

Keywords: high-standard farmland; peasants' effective participation; ordered logistic model; social networks; government support



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1. Introduction

To improve the quality of cultivated land resources, increase the overall agricultural production capacity, and strengthen food security, China has launched a high-standard farmland construction (HSFC) program. High-standard farmland refers to the farmland with flat land, centralized contiguous land, perfect facilities, supporting agricultural electricity, loamy soil, good ecological environment, strong resilience to disasters, guaranteed harvest in drought and flood, high and stable yield, which is adapted to modern agricultural production and management mode, and is designated as basic farmland for permanent protection [1]. High-standard farmland construction (HSFC) refers to a series of construction activities to increase the quality of cultivated land and environmental sustainability, including land levelling, soil amelioration, irrigation and dewatering, field roads, farmland shelterbelts and ecological environment conservation, electric power transmission and

distribution of farmland and other engineering reconstruction [2,3]. Strengthening the HSFC in the new era is a very important foundation for the deeply promoting the rural revitalization strategy, and a major measure to effectively guarantee national food security and promote high-quality agricultural development [4,5]. The scientific HSFC can ameliorate farmland infrastructure, raise agricultural production conditions and the country's comprehensive food production capacity, push forward the change of agricultural production methods, efficiently improve the level of farmland ecological environment, and broaden the channels for peasants to increase their levels of income and become rich [6,7]. By the end of 2020, China has built 800 million mu (53.33 million hectares) of high-standard farmland, which has enhanced the capacity of farmland to prevent, resist, and mitigate disasters and consolidated and improved the comprehensive grain production capacity. The average grain production capacity of the completed high-standard farmland has increased from 10% to 20% per mu. The HSFC has substantially raised the level of green agricultural development, saving water, electricity, fertilizer, and medicine, and has promoted the overall protection of mountains, water, forests, fields, lakes, and grasses, leading to the continuous improvement of the rural environment [8,9].

Nevertheless, there are still some questions in the HSFC. The investigation at the decision-making stage of the HSFC is not very detailed, the planning and design is not consistent with the actual situation of agricultural production, the construction stage does not follow the planning and design plan, and the quality of the projects is not high; moreover, the responsibility and authority at the final management and maintenance stage are not completely clear [4,10]. The main cause of the above problems is the lack of peasants' effective participation in HSFC, and peasants are excluded from the decision-making body and process management of HSFC [11]. With the rise in economic development and social progress, the Chinese government has begun to pay attention to peasants' participation in HSFC, formulates High Standard Basic Farmland Construction Standards and the HSFC Plan (2021–2030), which states that peasants are encouraged to take part in the HSFC by giving full play to peasants' initiative, and emphasizes government-led, diversified participation and the main role of farmers. However, the reality of actively exploring effective ways for peasants to participate in HSFC in various regions is not optimistic, and there are still widespread phenomena such as peasants' participation not being in-depth, participation in a relatively single way, low participation, and lack of effective participation in the process of project implementation [11,12]. Peasants' effective participation is an important way to raise the performance of HSFC, then how to avoid inefficient peasant participation is an important issue that urgently needs to be solved in the field of HSFC. To further raise the decision-making level of HSFC investment, successfully implement HSFC policies, and effectively improve the efficiency of fund use, it will be great use to analyze the peasants' effective participation in HSFC, which is also a vital element of the current HSFC work that needs to be strengthened.

The research on HSFC has mainly focused on the suitability of HSFC [13–15], the benefit evaluation of HSFC [7,16–18], the peasants' participation of HSFC [3,19–23], the realistic challenges of HSFC [24,25], and the development path of the HSFC [5,6,25–27]. Based on the questionnaire survey data, experts and scholars have mainly used descriptive statistical analysis, factor analysis, double hurdle models, and logistic models to analyze farmers' participation behavior and influencing factors in HSFC [28–32]. The results of previous studies indicate that the factors influencing peasants' participation behavior in HSFC mainly include peasants' personal characteristics, peasants' family characteristics, and peasants' cognition in HSFC [29,30,33].

Peasants' participation behavior in HSFC takes place in a certain rural social environment and is inevitably influenced by peasants' individual social relations, then government support and social network lead to differences in the choice of peasants' participation behavior in HSFC. The existing literature provides important reference for this study, which is of great importance. However, existing studies still have room for further development. The existing studies mainly concern the effect of peasants' personal characteristics, peasants'

household characteristics, and peasants' cognitive characteristics on their participation behavior in HSFC. Furthermore, they have ignored the government as the main body of HSFC and failed to deeply analyze the influence of government support (information support, incentive support, constraint support) on the peasants' participation behavior in HSFC. Previous studies have paid less attention to the influence of social networks on the level of peasants' effective participation in HSFC. Further, although some studies have addressed the social motivation of peasants' participation behavior in HSFC, the dimensions of social networks indicators are relatively single, and no unified measurement indicators and methods have been developed.

Thus, based on theoretical analysis of the influence of government support and social networks on the peasants' effective participation in HSFC, this study used factor analysis and a comprehensive evaluation method to calculate social networks and the level of peasants' effective participation in HSFC based on a survey dataset of 347 peasants in Yancheng City, China. The influence of information support, incentive support, constraint support, network interaction, network trust, and network norms on the level of peasants' effective participation in HSFC was analyzed using an ordered logistic model. This paper is expected to provide some reference for government decision making for HSFC and the research by experts and scholars.

2. Theoretical Analysis and Research Hypotheses

2.1. Theoretical Analysis Framework for the Influence Factors of Peasants' Effective Participation in HSFC

According to the theory of embedded social structure, individual economic actions are always embedded in the social structure and are not completely atomized and isolated, but will be restricted by the social structure in which they are located [34]. Social relations play an important role in shaping economic activity. Peasants' participation behavior in HSFC is not only an economic behavior, but also a social behavior. Peasants' participation behavior in HSFC takes place in a certain rural social environment and is inevitably influenced by peasants' individual social relations. Government support has an impact on peasants' participation behavior in HSFC. Social networks can reduce the uncertainty of individual behavior in the selection environment, and play a role in the construction of trust environment, information sharing, and inhibition of opportunistic behavior. Government support and social networks lead to differences in the choice of peasants' participation behavior in HSFC, which has an important impact on the level of peasants' effective participation in the HSFC. Therefore, this study analyzed the influence of government support and social networks on the level of peasants' effective participation in HSFC.

2.2. Government Support and Peasants' Effective Participation in HSFC

The government support embedded refers to the influence of government policy formulation, publicity, and implementation on economic entities [35]. According to the requirements of cultivated land resources protection, basic conditions of grain production and agriculture sustainable development, China has formulated a policy for HSFC and vigorously implemented it. This study took peasants' participation behavior in HSFC as the research object. The regulations and policies of HSFC at the national level are generally the same. In the specific implementation process, policies and measures of local governments for the HSFC have some emphasis, which has different degrees of influence on the peasants' participation behavior in HSFC [36,37]. Local government support for the HSFC will be reflected in the form of information support, incentive support, and constraint support, which in turn will influence the peasants' participation behavior in HSFC [38,39].

Government support through information can promote peasants' access to information resources for HSFC, reduce peasants' information search costs for learning HSFC, promote peasants to actively participate in the HSFC, and thus increase the level of peasants' effective participation in HSFC [40]. Through incentive support, the government can increase the expected benefits of peasants' participation in HSFC, improve peasants' operating income,

promote peasants' adoption of HSFC decisions, and thus improve the level of peasants' effective participation in HSFC [41]. Government support through constraints can regulate peasants' agricultural production behavior and guide farmers to actively protect farmland, thus increasing the probability of peasants' participation in the HSFC.

According to the theoretical analysis of the government support and peasants' effective participation in HSFC, the research hypotheses proposed in this study are as follows:

Hypothesis 1 (H1). *Information support is very helpful to improve the level of peasants' effective participation in HSFC.*

Hypothesis 2 (H2). *Incentive support is very helpful for peasants to participate in HSFC.*

Hypothesis 3 (H3). *Constraint support is very helpful to improve the level of peasants' effective participation in HSFC.*

2.3. Social Networks and Peasants' Effective Participation in HSFC

Social networks refer to the formal or informal relationship network formed through the resource flow between each other in the process of action subject participating in activities [42,43]. In the light of embeddedness theory, the behavioral individual is not independent when behavioral individual making decisions, and the social networks he is on have a specific influence on his behavioral decisions [44,45]. In such a complicated rural social environment of China, the social networks of peasants have a considerably prominent effect on peasants' production, peasants' operation, and peasants' life [46,47].

Based on social networks theory, this study selected the core elements of network interaction, network trust, and network norms to build a research framework for the effect of social networks on peasants' effective participation in HSFC [48,49]. Network norms can reduce the moral risk of cooperation among social members, overcome opportunistic motives, reduce fraudulent behavior, and enhance the level of trust among social members. Network interaction can strengthen the repetition and connection of social relationships emphasized in game theory, and thereby enhance the level of trust among social individuals. The improvement of the level of network trust and the enhancement of trust contributes to the smooth realization of network norms and the construction and stable development of public participation networks. Social networks can integrate environmental resources and coordinate environmental interests by playing the synergistic role of cooperation mechanisms, communication mechanisms, and constraint mechanisms, thereby influencing peasants' effective participation in HSFC [49–51].

Social networks are social relationships and ties formed by social members through long-term interactive ties, and they have a major part to play in linking individuals and information transfer [42,52,53]. Network interaction can construct an information exchange platform for agri-environmental governance, promote communication among participating subjects of agri-environmental governance, establish trust and norms about environmental governance among participating subjects of agri-environmental governance, promote the positive transformation of collective actions of agri-environmental governance, and inject positive power into agri-environmental governance. Good network interaction can enhance information sharing among participants in HSFC, produce resonance, promote trust and a sense of belonging, form a coordination mechanism for HSFC, and effectively curb the phenomena of "opportunism" and "free-riding". Network interaction can help improve the communication mechanism of HSFC, facilitate farmers' access to information resources, reduce their opportunistic behavior, and increase their probability of peasants' participation in HSFC.

Network trust can promote the joint learning of agri-environmental governance knowledge among participating subjects, reduce the perception bias and disagreement among participating subjects in agri-environmental governance, and enable participating subjects to reach a consensus on agri-environmental governance issues [54]. Network trust promotes

intercommunication among participating subjects on agri-environmental governance issues and reduces contradictions and conflicts in the cooperation of environmental governance among participating subjects. Furthermore, the participating subjects discuss and form a consensus environmental governance strategy together to establish an agri-environmental governance mechanism that effectively shares environmental governance responsibilities and environmental governance costs [55]. Good network trust helps increase the willingness of participating subjects to share HSFC and information resources, break down information barriers and information asymmetry, and promote smooth communication among participating subjects and efficient sharing of HSFC and information resources and achieve strategic alliances. Network trust helps to improve the cooperation mechanism of HSFC, realize cooperative actions by strengthening information sharing, and improve the odds of peasants' participation in HSFC.

Network norms are the standards of behavior established and generally accepted by the group, and they improve the agricultural environmental governance level by constraining and guiding the behavior of participating subjects to form mechanisms [56]. Being in a rural social network, farmers' behavioral choices must consider individual rationality and collective rationality, including moral pressure and group norms, to take reciprocal actions that are consistent with village value identity, thereby gaining the recognition and support of relatives and friends and maintaining their good reputation [57]. In agri-environmental governance, network norms enable farmers to form tacit agreement and consensus on environmental governance issues enabling the monitoring and restraining of behaviors that are detrimental to environmental governance [58]. Network norms can help improve the constraint mechanism of HSFC and restrain peasants' agricultural production behavior through common conventions or village rules and regulations, thereby improving the probability of peasants' participation in HSFC.

According to the theoretical research of the social networks and peasants' effective participation in HSFC, the research hypotheses proposed in this study are as follows:

Hypothesis 4 (H4). *The network interaction is conducive to peasants' participation in HSFC.*

Hypothesis 5 (H5). *The network trust is very helpful for peasants to participate in HSFC.*

Hypothesis 6 (H6). *Network norm is conducive to improve the level of peasants' effective participation in HSFC.*

3. Materials and Methods

3.1. Data Source and Sample Overview

Yancheng City, located in the middle of the Jiangsu coast, has unique land, sea, and mudflat resources, which has the largest land area and the longest coastline among the 13 prefecture-level cities in Jiangsu Province. The city's land area is 16,900 km², of which 8378 km² is arable land [59]. The city's coastline is 582 km long, with a total mudflat area of 4553 km². In 2021, The number of primary industry employees in Yancheng City reached 792,000, and the number of agricultural technicians reached 2400. The gross regional product in Yancheng city was CNY 661.74 billion, an increase of 7.7% over 2020. The per capita GDP reached CNY 98,593, an increase of 7.6% over 2020. The total agricultural output of Yancheng city reached CNY 131.16 billion, comparable price increasing by 4.5%. The agricultural added value in Yancheng city reached CNY 78.34 billion, comparable price increasing by 3.6%. The per capita disposable income of rural residents in Yancheng city reached CNY 26,049, net operating income of rural households was CNY 8174, and the per capita living consumption expenditure of rural residents was CNY 18,443. The sown area of grain reached 991.8 thousand hectares, and the total grain output of Yancheng reached 7.148 million tons. The construction of modern agriculture has accelerated; the annual newly built national high-standard farmland area was 697,000 mu, including 43,500 mu of high-efficiency water-saving irrigation. The total power of agricultural machinery in

Yancheng city was 7.568 million kilowatts, and the crop mechanization rate of Yancheng city reached 83.1%.

In this study, through the multi-stage stratified sampling method, peasants' questionnaire survey on the HSFC was carried out from August to September 2018. Firstly, Funing county, Jianhu county and Sheyang county were selected from Yancheng city of Jiangsu Province according to regional economic conditions and agricultural production conditions (Figure 1). Secondly, the study selects 2 towns in each county and 3 villages in each town, and randomly select 20–25 households in each village for investigation. The number of peasants' questionnaires for HSFC reached 365, and the number of effective questionnaires for HSFC reached 347. The survey results showed that the average age of the peasants reached 58, and the average per capita contracted land area of the peasants reached 4.04 mu. The percentage of peasants with elementary school education reached 16.71%, and the percentage of junior high school graduates reached 40.35%. The average per capita annual income of the peasants is CNY 14,300, and the average total family population reached 4.55.

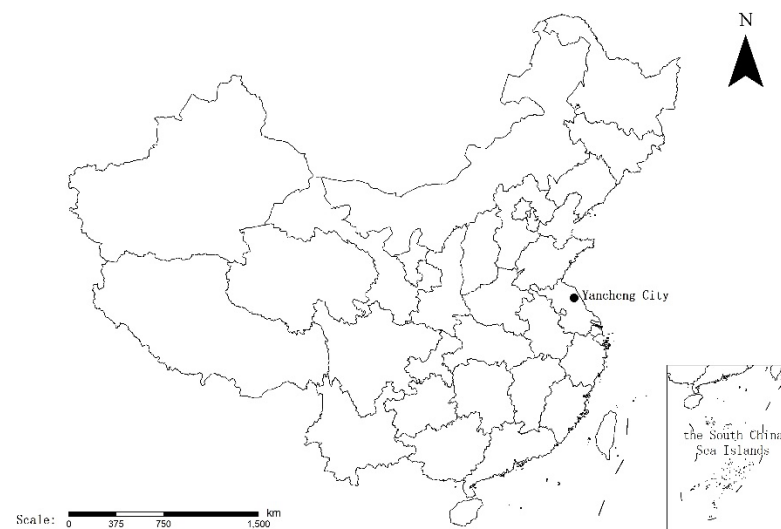


Figure 1. The location map of Yancheng City.

3.2. Variable Selection

3.2.1. Dependent Variable

The dependent variable of regression model was “the level of peasants’ effective participation in HSFC”. This study draws on Thomas’ effective decision analysis model of citizen participation [60], and builds the effective participation model of peasants in the HSFC on the basis of relevant literature [61,62]. On this basis, an evaluation index system of peasants’ effective participation was established from five dimensions of participation, including scope, subject, channel, depth and validity (Table 1). The scope of peasants’ participation involves four stages of HSFC projects. In different stages, the content of the scope of peasants’ participation is different, so the measurement indicators of each stage are also different. x_1 to x_4 are the measurement indicators of the application and approval stage of HSFC projects, and x_5 to x_7 are the measurement indicators of the planning and design stage of HSFC projects. x_8 to x_{11} are the measurement indexes of the construction stage of HSFC projects, and x_{12} are the measurement indexes of the later management and protection stage of HSFC projects. Except the dimension of participation scope, the evaluation index system is the same for peasants’ effective participation in the application and approval stage, planning and design stage, construction stage and later management and protection stage of HSFC projects, which mainly includes four dimensions of evaluation indicators, such as participants, participation channels, participation depth and participation validity. Each stage includes the 10 evaluation indexes x_{13} to x_{22} . For the 12 evaluation indicators

in the dimension of participation scope, each indicator has two cases of participation and non-participation. The value of participation is 1, and the value of non-participation is 0. Likert scale method was used to measure 10 evaluation indexes of the other 4 dimensions (participant, participation channel, participation depth, participation validity), and each evaluation index was assigned a value of 1, 0.8, 0.6, 0.4, 0.2 from the best to the worst.

According to the questionnaire data of peasants, the weight of each measure indicator for the level of peasants' effective participation in HSFC was computed by the improved entropy method, and the effective participation level of each peasant was diagnosed by the comprehensive evaluation method. The peasants' effective participation in HSFC was assigned a value of 1 for those whose effective participation level was less than 20%, 2 for those whose effective participation level was between 20% and 40%, 3 for those whose effective participation level was between 40% and 60%, 4 for those whose effective participation level was between 60% and 80%, and 5 for those whose effective participation level was 80% or more.

Table 1. Evaluation index for the level of peasants' effective participation in HSFC.

Guideline Layer	Indicator Layer	Evaluation Index Assignment
Scope of participation	x_1 participation in the discussion on the necessity and urgency of HSFC	Participating = 1, No participating = 0
	x_2 participation in the discussion of the preliminary scheme of HSFC	Participating = 1, No participating = 0
	x_3 participation in the discussion of the ownership adjustment plan for the HSFC	Participating = 1, No participating = 0
	x_4 participation in the demonstration and review of the feasibility study report of the project	Participating = 1, No participating = 0
	x_5 cooperate with the research of the design unit to answer questions in time	Participating = 1, No participating = 0
	x_6 put forward his own opinions on the preliminary plan of planning and design	Participating = 1, No participating = 0
	x_7 participation in planning and design rationality discussion or review	Participating = 1, No participating = 0
	x_8 participation in quality supervision of HSFC projects	Participating = 1, No participating = 0
	x_9 participation in discussions or solicit comments on design changes	Participating = 1, No participating = 0
	x_{10} participation in the quality acceptance of HSFC projects	Participating = 1, No participating = 0
	x_{11} participation in HSFC rights and interests' distribution and confirmation activities	Participating = 1, No participating = 0
	x_{12} participation in the late management and protection of HSFC projects	Participating = 1, No participating = 0
participant	x_{13} main types of peasants' participation	Ordinary peasants = 0.2, local elite = 0.4, village committee or farmer organization = 0.6, village committee or farmer organization and local elite = 0.8, village committee or farmer organization, local elite and ordinary peasants = 1.0
	x_{14} breadth of peasants' participation	Very low = 0.2, lower = 0.4, general = 0.6, higher = 0.8, very high = 1.0
Channel of participation	x_{15} the number of types of peasants' participation channels	One = 0.2, two = 0.4, three = 0.6, four = 0.8, five or more = 1.0
	x_{16} suitability of peasants' participation channels	Very poor = 0.2, poor = 0.4, general = 0.6, good = 0.8, very good = 1.0
Depth of participation	x_{17} peasants' opinions reach the power level	Very low = 0.2, lower = 0.4, general = 0.6, higher = 0.8, very high = 1.0

Table 1. Cont.

Guideline Layer	Indicator Layer	Evaluation Index Assignment
Participation validity	x_{18} adequacy of peasants' participation	Failure to fully express opinions = 0.2; relatively fully express opinions and incomplete consensus = 0.4; fully express opinions but fail to reach consensus through repeated comparison = 0.6; relatively fully express opinions and basically able to reach consensus = 0.8; in-depth debate and repeated comparison result in consensus = 1
	x_{19} autonomy of peasants' participation	peasants have a very vague understanding of participating matters and fully follow others' opinions = 0.2, peasants have a vague understanding of participating matters and strong interference by others = 0.4, peasants have a clear understanding of participating matters but are interfered by others to a certain extent = 0.6, peasants have a clear understanding of participating matters and little interference by others = 0.8, peasants have a clear understanding of the matters involved and are completely free from interference from others = 1
	x_{20} effect of expression of peasants' opinions	The expression of peasants' will and opinions is not complete and accurate and clear = 0.2; the expression of peasants' will and opinions is basically complete but not accurate and clear = 0.4; the expression of peasants' will and opinions is basically complete, accurate and clear = 0.6; the expression of peasants' will and opinions is relatively complete, accurate and clear = 0.8; The expression of peasants' wishes and views is very complete, accurate and clear = 1
	x_{21} acceptability of peasants' opinions	Very low = 0.2, lower = 0.4, general = 0.6, higher = 0.8, very high = 1.0
	x_{22} feedback of comments not received	Rarely = 0.2, less = 0.4, general = 0.6, more = 0.8, many = 1.0

3.2.2. Core Independent Variable for Regression Model

For the level of peasants' effective participation in HSFC, the core independent variables for regression model were divided into social networks and government support, with social networks including network interaction, network trust, and network norms, and government support divided into information support, incentive support, and constraint support. For social networks, the two variables of the "Frequency of contacting relatives and friends (x_7)" and "Frequency of contacting acquaintances (x_8)" was used to characterize network interaction. Further, the four variables of "peasants' trust degree of township government (x_1)", "peasants' trust degree of village cadres (x_2)", "peasants' trust degree of neighbors (x_3)", and "peasants' trust degree of highly respected villagers (x_4)" were used to characterize network trust. Finally, the two variables of "Whether they will be punished or discussed for not participation in collective activities (x_5)" and "Times of participating in major events in the village (x_6)" were used to characterize network norms.

For government support, one variable, "HSFC information disclosure" was used to characterize information support, one variable "government support level for peasants' participation in HSFC (incentive support)" to characterize incentive support, and one variable "government attach importance to peasants' participation in HSFC (degree of constraint)" to characterize constraint support (Table 2).

Table 2. Variable connotation and assignment.

Variable Category	Variable Name	Variable Assignment
Dependent Variable	the level of peasants' effective participation	Very high = 5, higher = 4, medium = 3, lower = 2, very low = 1

Table 2. Cont.

Variable Category	Variable Name	Variable Assignment
Core independent variables	Information support	Very high = 5, higher = 4, general = 3, lower = 2, very low = 1
	Incentive support	Very support = 5, more support = 4, general = 3, not very support = 2, not very support = 1
	Constraint support	Very attention = 5, relatively attention = 4, general = 3, not very attention = 2, very little attention = 1
	Network interaction	Measure index by factor analysis
	Network trust	Measure index by factor analysis
	Network norms	Measure index by factor analysis
Control variables	Age	Continuous Variable
	Sexual distinction	Male = 1, female = 0
	Per capita annual income	Continuous Variable
	Household labor force	Continuous Variable
	Peasants' cognition	Very familiar = 5, relatively familiar = 4, general = 3, not very clear = 2, do not know at all = 1

3.2.3. Control Variable for Regression Model

In this study, referring to relevant research results [29,30,33], three control variables are introduced into the regression model, which includes personal characteristics, household characteristics, and cognitive characteristics of the peasants. Two variables, age and sexual distinction, were used to characterize the personal characteristics of the peasants; two variables, per capita annual income and household labor force, were used to characterize the household characteristics of the peasants. One variable, the degree of understanding for HSFC, was used to characterize the cognitive characteristics of the peasants.

3.3. Research Method

3.3.1. Comprehensive Evaluation Method

This study used the comprehensive evaluation method to count the level of peasants' effective participation in HSFC [63,64], the formula of comprehensive evaluation method is as follows:

$$F_i = \sum_{j=1}^n X_{ij} \times w_j \quad (1)$$

In equation: F_i denotes the level of peasants' effective participation in HSFC; X_{ij} reflects the original value of the j evaluation indicator of the i sample; w_j denotes the weight of the j measure indicator for the level of peasants' effective participation in HSFC, and n reflects the number of evaluation indexes for the level of peasants' effective participation in HSFC.

The degree of effect of different evaluation index for the level of peasants' effective participation in HSFC varies to a certain extent, and certain weights need to be assigned to the evaluation indicators. This text utilized improved entropy method to count the weights of measure indicator for the level of peasants' effective participation in HSFC. The calculation process of improved entropy method is as follows: standardization of evaluation indexes, coordinate translation, measurement of the weight of i sample values under the j measure indicator for the level of peasants' effective participation in HSFC, measurement of the entropy value of the j measure indicator, measurement of the coefficient of variability g_j of the j measure indicator for the level of peasants' effective participation in HSFC, and measurement of the weight w_j of the j measure indicator for the level of peasants' effective participation in HSFC [65].

3.3.2. Factor Analysis Method

The factor analysis method comedy from the statistical studies of Karl Pearson, Charles Spearman, and others experts and scholars about intelligence tests in the early 20th century,

and it has been widely used in economics, management, sociology, psychology, medicine, and other fields [66,67]. Factor analysis method belongs to a multivariate statistical analysis method, which studies how to condense the social networks' original variables into a few common factors reflecting most information, and how to let the common factors have a certain naming explanation. Further, its main features are to utilize fewer mutually independent public factors to represent the majority of the information for the original variables of social networks, and to reflect the internal relationship between the original variables of the social networks [68,69]. The factor analysis model for social networks is as follows:

$$\begin{cases} x_1 = a_{11}F_1 + a_{12}F_2 + a_{13}F_3 + \dots + a_{1k}F_k + \varepsilon_1 \\ x_2 = a_{21}F_1 + a_{22}F_2 + a_{23}F_3 + \dots + a_{2k}F_k + \varepsilon_2 \\ x_3 = a_{31}F_1 + a_{32}F_2 + a_{33}F_3 + \dots + a_{3k}F_k + \varepsilon_3 \\ \dots \\ x_p = a_{p1}F_1 + a_{p2}F_2 + a_{p3}F_3 + \dots + a_{pk}F_k + \varepsilon_p \end{cases} \quad (2)$$

In Equation (2), the original variables of social networks level are denoted by x_i , mainly including $x_1, x_2, x_3, \dots, x_p$; F_j represents the common factors, mainly including $F_1, F_2, F_3, \dots, F_k$, and the number of common factors k is smaller than the number of social networks' original variables p . a_{ij} represents the common factor loadings, which are the correlation coefficients of the social networks' original variables x_i and factors F_j , reflecting the correlation degree between the social networks' original variables x_i and the common factors F_j . Further, the more the absolute value tends to 1, the stronger correlation. The ε_i represents the special factor, reflecting the part of the original variable x_i that cannot be illustrated by the common factor [70–72].

3.3.3. Ordered Logistic Model

The level of peasants' effective participation in HSFC is a sorted discrete variable with obvious order; thus, this study used an ordered logistic model for empirical analysis with the following model form [73,74].

$$Y^* = \beta \times X_i + \varepsilon \quad (3)$$

In equation: Y^* is the latent variable that cannot be directly observed, X_i is the set of explanatory variables for the level of peasants' effective participation in HSFC, β indicates the parameter to be computed, and ε indicates the random disturbance term of the ordered logistic model. The selection model of Y is constructed as follows:

$$Y = \begin{cases} 1, & Y^* \leq \mu_1 \\ 2, & \mu_1 < Y^* \leq \mu_2 \\ 3, & \mu_2 < Y^* \leq \mu_3 \\ 4, & \mu_3 < Y^* \leq \mu_4 \\ 5, & \mu_4 < Y^* \end{cases} \quad (4)$$

In equation: Y is the level of peasants' effective participation in HSFC and is an ordinal variable with values from 1 to 5, $\mu_1, \mu_2, \mu_3, \mu_4$ are the four demarcation points for the level of peasants' effective participation in HSFC. When $Y^* \leq \mu_1$, i.e., $Y = 1$, it indicates that peasants' effective participation in HSFC reaches a very low level; When $\mu_1 < Y^* \leq \mu_2$, i.e., $Y = 2$, it indicates that peasants' effective participation in HSFC reaches a low level; When $\mu_2 < Y^* \leq \mu_3$, i.e., $Y = 3$, it indicates that peasants' effective participation in HSFC reaches a medium level; When $\mu_3 < Y^* \leq \mu_4$, i.e., $Y = 4$, it indicates that peasants' effective participation in HSFC reaches a high level; When $\mu_4 < Y^*$, i.e., $Y = 5$, it indicates that peasants' effective participation in HSFC reaches a very high level [75].

4. Results

4.1. The Level of Peasants' Effective Participation in HSFC

On the basis of peasants' questionnaire survey, the values of each peasant's evaluation index of effective participation in HSFC were sorted out, and the weights of the evaluation indexes of peasant s' effective participation in HSFC were measured by the improved entropy method (Table 3). According to the results of peasants' questionnaire, the comprehensive evaluation method was utilized to measure the level of peasants' effective participation in HSFC. The proportion of reaching a low level for peasants' effective participation in HSFC was 27.09%, and the proportion reaching a high level was 29.97%. The minimum and maximum values of peasants' effective participation level in HSFC were 0.1950 and 0.9547, respectively, and the average value of peasants' effective participation in HSFC reached 0.5305. The overall level of peasants' effective participation in the HSFC was at a "medium" level, and the level of peasants' effective participation needed to be further improved.

Table 3. The level of peasants' effective participation in HSFC.

Effective Participation Level	Stage I	Stage II	Stage III	Stage IV	Entire Process
Very low [0, 0.20)	0.86	0.58	1.15	0	0.29
Lower [0.20, 0.40)	33.14	29.68	28.53	23.34	27.09
Medium [0.40, 0.60)	27.38	34.01	32.28	35.16	35.16
Higher [0.60, 0.80)	29.11	26.22	28.82	34.58	29.97
Very high [0.80, 1.00]	9.51	9.51	9.22	6.92	7.49

Note: Stage I, II, III, IV refer to the application and approval stage, planning and design stage, construction stage, later management and protection stage, respectively.

4.2. Social Networks Measure

Since this questionnaire was carried out specifically in the form of a constructed scale, before the social network index measure, the quality of the scale was first designed to clarify whether the social networks' original variables can be processed by factor analysis. The diagnostic results showed that the Kaiser–Meyer–Olkin test for the factor analysis model for social networks achieved 0.7, and the test statistic of Bartlett's sphericity achieved 844.8. The corresponding probability of 0.000 was less than 0.01, which is very significant, indicating that the social networks original variables can be processed by factor analysis. The public factors of social networks were extracted using principal component analysis, then the three public factors of social networks were extracted according to the principle that the characteristic value was greater than 1. The total variance contribution rate of the three common factors for the social networks exceeded 69.7%, making clear that three common factors can represent most information for the social networks original variables, and therefore, the result of factor analysis was valid. The first public factor had the largest variance contribution rate of 33.49% and was the most important influential factor. To more effectively research the social networks public factors, conduct orthogonal rotation with Kaiser standardization for factor model to make the loading coefficients of the public factors closer to 1 or 0. The rotation converged after four iterations to generate factor load matrix after rotation of social networks (Table 4).

Table 4 shows that the loadings of the three public factors (network trust, network interaction, and network norms) on the original variables of social networks were all greater than 0.5. Further, the original variables of social networks did not cross-load on the three public factors, showing good discrimination validity and aggregation validity. Regression analysis was utilized to calculate the factor score coefficients, and the factor score coefficient matrix of social networks was obtained (Table 5). Based on the factor score coefficient matrix of social networks, the three public factors can be expressed as linear combinations of the original variables of social networks. The weight of the original variables of the social networks was measured on the basis of factor score coefficient matrix and public factors'

variance contribution rate of social networks, and network trust index, network interaction index, and network norm index were estimated on this basis.

Table 4. Factor load matrix after rotation.

Original Variable	Factor 1	Factor 2	Factor 3
x_1	0.820	0.037	0.146
x_2	0.881	0.054	0.102
x_3	0.760	0.029	−0.085
x_4	0.713	0.065	−0.071
x_5	−0.166	−0.069	0.883
x_6	0.332	0.328	0.646
x_7	0.028	0.874	0.000
x_8	0.061	0.871	0.104

Table 5. Factor score coefficient matrix.

Original Variable	Factor 1	Factor 2	Factor 3
x_1	0.308	−0.055	0.086
x_2	0.332	−0.043	0.045
x_3	0.294	−0.029	−0.102
x_4	0.273	−0.004	−0.093
x_5	−0.092	−0.134	0.744
x_6	0.079	0.111	0.484
x_7	−0.055	0.558	−0.102
x_8	−0.046	0.542	−0.017

4.3. Regression Analysis Results of Influence Factor for the Peasants' Effective Participation in HSFC

In order to diagnose the influence of government support and social networks on the peasants' effective participation in HSFC, this study adopted the following strategies: first, put control variables in the regression model to obtain Model I. Second, add information support variable, incentive support variable, constraint support variable, network interaction variable, network trust variable and network norms variable to Model I, then examine the influence of government support and social networks on the peasants' effective participation in HSFC to obtain Model II (Table 6). It is easy to find that the Cox & Snell R² and Nagelkerke R² were significantly improved when add information support variable, incentive support variable, constraint support variable, network interaction variable, network trust variable and network norms variable to the model, and thus, it can be concluded that information support variable, incentive support variable, constraint support variable, network interaction variable, network trust variable and network norms variable have important influence. Therefore, this article analyzed the influence of government support and social networks on the level of peasants' effective participation in HSFC based on Model II. The chi-square test value of Model II was 249.33, corresponding to a probability of 0.00 less than 0.01, which was highly significant, indicating that the regression equation passed the significance test.

Table 6. Regression analysis results of influence factor for the level of peasants' effective participation in HSFC.

Variable	Model 1	Model 2
Age	−0.027 (0.010) ***	−0.015 (0.010)
Sexual distinction	0.659 (0.327) **	0.148 (0.358)
Per capita annual income	0.023 (0.059)	0.078 (0.062)
Household labor force	0.008 (0.090)	0.013 (0.097)
Peasants' cognition	1.119 (0.123) ***	0.679 (0.135) ***

Table 6. Cont.

Variable	Model 1	Model 2
Information support		0.442 (0.158) ***
Incentive support		0.702 (0.222) ***
Constraint support		0.519 (0.228) **
Network trust		0.485 (0.128) ***
Network interaction		0.599 (0.164) ***
Network norms		0.477 (0.117) ***
Cox & Snell R ²	0.324	0.513
Nagelkerke R ²	0.350	0.554

Note: **, *** indicate passing significance tests at the 5%, and 1% statistical levels, respectively; values in parentheses are standard errors.

4.3.1. Core Independent Variable for Regression Model

Overall, the information support, incentive support, constraint support, network interaction, network trust, and network norms variables passed the significance test and had positive coefficients, indicating that information support, incentive support, constraint support, network interaction, network trust, and network norms significantly contributed to level of peasants' effective participation in HSFC (Table 6).

- (1) The effect of information support on peasants' effective participation in HSFC. The information support variable positively affects peasants' effective participation in HSFC at the 1% significant level, and the research hypothesis H1 is verified. With other conditions unchanged, the higher the government information support level, and the higher the level of peasants' effective participation in HSFC.
- (2) The effect of incentive support on peasants' effective participation in HSFC. The incentive support variable has a positive effect on peasants' effective participation in HSFC, and it is significant at the 1% level. Thus, the research hypothesis H2 is verified. With other conditions unchanged, the higher the government incentive support extent, the higher the level of peasants' effective participation in HSFC.
- (3) The effect of constraint support on peasants' effective participation in HSFC. The constraint support variable positively affects peasants' effective participation in HSFC at the 5% significant level, and research hypothesis H3 is verified. With other conditions unchanged, the higher the government constraint support extent, the higher the level of peasants' effective participation in HSFC.
- (4) The influence of the network interaction on the level of peasants' effective participation in HSFC. The network interaction variable positively affects the level of peasants' effective participation in HSFC at the 1% significant level. Thus, the research hypothesis H4 is verified. Controlling for other independent variables, the higher the network interaction extent, the higher the level of peasants' effective participation in HSFC.
- (5) The influence of network trust on the level of peasants' effective participation in HSFC. The effect of network trust variables on peasants' effective participation in HSFC is positive and passed the significance test at the level less than 0.01, and accordingly, the research hypothesis H5 is verified. Controlling for the other independent variables, the level of peasants' effective participation in HSFC increases by 62.42% for each increase in one level of network trust variable. This indicates that the higher the network trust extent, the higher the level of peasants' effective participation in HSFC.
- (6) The influence of network norms on the level of peasants' effective participation in HSFC. The influence of network norms variables on the level of peasants' effective participation in HSFC is positive and passed the significance test at the level less than 0.01. Thus, the research hypothesis H6 is verified. Controlling for the other independent variables, each increase in the level of network norms by one level increases the level of peasants' effective participation in HSFC by 61.12%. This indicates that network norms can play a binding role and significantly and positively influence the level of peasants' effective participation in HSFC. Specifically, the higher

the network norms extent, the higher the level of peasants' effective participation in HSFC.

4.3.2. Control Variables for Regression Model

According to Model 2, among the control variables of regression model, peasants' cognition variable passed the significance test. The peasants' cognition variable positively affects the level of peasants' effective participation in HSFC at the 1% significant level. This shows that peasants with a high degree of knowledge about HSFC are more likely to participate in the HSFC. The higher the degree of peasants' understanding of HSFC, the higher the level of peasants' effective participation in HSFC, and the lower the information collection cost of participating in HSFC projects, and then affect peasants' participation in decision making of HSFC. The higher the degree of peasants' knowledge about HSFC, the better peasants' awareness of comprehensive benefits generated by HSFC, and with the stimulation and impetus of comprehensive benefits, the level of peasants' effective participation in HSFC will be increased.

5. Discussion

The influence of information support, incentive support, constraint support, network interaction, network trust and network norms variables on the level of peasants' effective participation in HSFC is positive, indicating that government support and social networks significantly improve the level of peasants' effective participation in HSFC. This study conducted a correlation analysis between core independent variables, and the results displayed that there was no correlation between government support and social networks.

The government's publicity on the HSFC can enhance peasants' understanding of high-standard farmland and dispel their worries, and the government's publicity work is also an endorsement of high-standard farmland with its own credibility, thus enhancing peasants' confidence in the HSFC and promoting peasants' participation in the HSFC. The degree of information disclosure of HSFC projects determines the size of peasants' participation costs. The higher the information disclosure extent, the lower the cost for peasants to search for project information in the process of participation in HSFC, and the greater the possibility of participation in the HSFC.

Government incentive support for HSFC diminished peasants' concerns about the HSFC and increased peasants' recognition of HSFC. To a certain extent, the incentive support increases peasants' expected benefits and reduces peasants' expected costs, which directly increases the benefits of peasants' participation and stimulates peasants' enthusiasm to participate, thus promoting the improvement of level for peasants' effective participation in HSFC.

The government forms a mandatory regulation of peasants' agricultural production behavior through constraint support, and farmers may be punished if they deviate from their behavioral goals and fail to carry out agricultural production as required, which requires farmers to fully weigh the risks and costs of non-compliance when implementing individual decisions. Out of rational considerations, peasants will conform to the behavioral goals in order to avoid penalties and gradually shift to agricultural production methods that protect farmland, which in turn motivates farmers to actively participate in the HSFC.

Peasants with a high level of network interaction have more information channels and can obtain abundant information resources about HSFC projects, which reduces information search costs and thus increases the possibility of peasants' participation in it. Further, peasants with a higher level of network interaction have more stable social resources, and such stable social resources as a carrier of information transmission of HSFC projects help information overflow and knowledge dissemination of HSFC projects, promote peasants' understanding of its comprehensive benefits of HSFC projects, and thus motivate peasants to participate in it. Peasants with the higher the frequency of contacting relatives and friends and acquaintances usually have more social resources, which is able to help them

exert a stronger communication and social mobilization ability, and thus promotes the level of peasants' effective participation in HSFC.

Network trust is the adhesive that condenses the participants in agricultural environmental governance, and has a certain role in promoting the HSFC actions of participants. Network trust can improve peasants' future expectations of HSFC actions, optimize the co-operation mechanism for HSFC actions, so as to enhance peasants' willingness to cooperate. Good network trust can form a benefit-sharing and risk-sharing mechanism, which helps the formation of peasants' awareness of participation in HSFC, and accordingly increases the probability of peasants' participation in it.

Network norm is a kind of "soft constraint" normative mechanism, which defines the approved and disapproved behaviors. It can make individuals who violate the village value identification and public agreement norm be ostracized by other members of the village and subjected to public opinion pressure and moral condemnation, so as to inhibit the "free rider" behavior of peasants participating in public affairs. Peasants' participation behavior in HSFC is an action that contributes to the improvement of farmland quality and agricultural environment in the whole village. All participants can gain a good social reputation and benefits from the HSFC. Good network norms can promote cooperation among peasants and help to form peasants' participation consciousness in HSFC. Strengthening peasants' awareness of network norms can improve peasants' participation probability in HSFC.

The results displayed that the overall level of peasants' effective participation in HSFC was not high, the proportion of peasants' participation scope was low, the breadth of peasants' participation was not high, the types of peasants' participation channels were relatively simple, the depth of peasants' participation was limited, and the validity of peasants' participation was insufficient. The degree of government incentive support is higher than that of information support and constraint support, but the overall level of government support is still not high and needs to be further improved. Peasants' social network levels is not high, which needs to improve further. Therefore, it is necessary to strengthen incentive support, information support and constraint support, improve the level of network interaction, network trust and network norms, and further enhance the level of peasants' effective participation in HSFC.

We believe that our study commits a significant contribution to the literature because most of the previous studies about influencing factors of peasants' participation behavior in HSFC have primarily focused on the peasants' individual factors or peasants' family factors [29,30,33], ignoring the premise that China's HSFC is government-led, and neglecting the impact of social networks on the peasants' effective participation in HSFC. In addition, the research on peasants' participation in HSFC mainly focuses on their participation willingness and participation behavior [12,28,30,31], the analysis of the peasants' effective participation in HSFC is rare, and existing research rarely considers the later management and protection stage of HSFC. This study comprehensively established the evaluation index system for diagnosing the peasants' effective participation in HSFC, and adopted the comprehensive evaluation method to measure the level of peasants' effective participation in HSFC. This study builds the evaluation index system of social networks measurement from the three aspects of network interaction, network trust and network norms, and uses factor analysis method to diagnose social networks level. The ordered logistic model was used to dissect the effects of information support, incentive support, constraint support, network interaction, network trust and network norms on peasants' effective participation in HSFC.

6. Conclusions and Prospects

6.1. Research Conclusions

Government support significantly influences the peasants' effective participation in HSFC. The incentive support variable positively affected peasants' effective participation in HSFC at the 1% significant level, the information support variable passed significance

test at 0.01 level with regression coefficient being greater than 0, and the constraint support variable positively affected peasants' effective participation in HSFC at the 5% significant level. Strengthening information support, incentive support, and constraint support can improve the level of peasants' effective participation in HSFC. Social networks significantly influence the peasants' effective participation in HSFC, and their core variables contribute to peasants' effective participation in HSFC in the order of network interaction > network trust > network norms. Increasing the degree of network interaction, the level of network trust, and the degree of network norms can increase the level of peasants' effective participation in HSFC. The peasants' cognition variable contributes to peasants' effective participation in HSFC, and was significant at the 0.01 level.

Overall, this study yielded some valuable discoveries. Government information support, incentive support, and constraint support, network interaction, network trust, network norms, and peasants' cognition can significantly improve the level of peasants' effective participation in HSFC. We can strengthen government information support, incentive support, and constraint support, enhance the level of network interaction, network trust, and network norms, strengthen education and training, raise Improve peasants' understanding level of HSFC, and guide Chinese peasants' to actively participate in the HSFC. The research conclusions can be used in other countries around the world.

6.2. Policy Recommendations

(1) Increasing governmental support

Further improve the government's support for the HSFC, increase the publicity on HSFC, and create a good atmosphere surrounding HSFC. Further strengthen the publicity of the comprehensive benefits of HSFC projects and further improve peasants' awareness of its benefits. Establish an effective information disclosure mechanism for HSFC projects, guarantee peasants' right to know, and reduce the institutional and information costs of peasants' participation. Establish and improve the mechanism of peasants' participation, pay full attention to the dominant position of peasants', increase the support for peasants' participation, improve the operation mechanism of peasants' participation in HSFC, enrich the channels of peasants' participation in the decision making of HSFC, and optimize the way of peasants' participation in HSFC. To further reinforce the government incentive support, optimize the incentive mechanism of HSFC, and bring into play to the positive role of incentives support in guiding peasants' green agricultural production behavior. Strengthen the constraint support, improve the constraint mechanism of HSFC, and form substantial constraints on the behavior of farmers in HSFC, thus promoting peasants' participation in HSFC.

(2) Improving social networks level

Further expand social networks, strengthen network interaction, build information exchange platforms, promote positive interactions among peasants, and increase the probability of peasants' participation in HSFC. Develop community social organizations and increase the participation rate of peasants through the interaction of community social organizations. Increase the benign interaction between farmers and community members, expand peasants' social interactions and information sources, and reduce peasants' information acquisition costs. Further enhance the degree of cooperation and interaction among peasants, improve the cohesion of community development, raise the level of peasants' social capital, promote peasants' collective participation, and thus enhance level of peasants' effective participation in HSFC.

Enhance network trust, promote collective actions and cooperation among peasants, build peasants' good expectations of others' participation in HSFC, and increase the probability of peasants' participation. Promote the improvement of grassroots organizations, standardize the content of collective activities, improve the level of openness in village affairs and supervision in the village, and increase the level of peasants' trust in village cadres. Encourage exchanges between peasants and their neighbors in HSFC, strengthen

cooperation in the process of participation, and thus increase the degree of mutual benefit between peasants. Actively carry out various cultural and recreational activities in rural communities to enrich the spiritual and cultural life of peasants, promote communication and interaction among different farmers, enhance the level of trust among peasants, and promote peasants' participation in HSFC.

Improve network norms, influence peasants' choices through the pressure of external public opinion and the constraints of their own moral norms, and guide peasants to participate in HSFC. Improve policies and regulations on HSFC, regulate the rights and obligations of peasants to participate in HSFC, carry out publicity on policies and regulations, promote the concept of green agricultural development, broaden peasants' participation channels, and encourage peasants to participate in HSFC. Incorporate HSFC into village rules and regulations to form effective moral constraints, inhibit peasants' self-interest behavior, and guide farmers to actively participate in HSFC.

(3) Further strengthening education and training

Effective education and training are conducive to enhancing the level of peasants' effective participation in HSFC. Thus, it is necessary to increase investment in peasants' re-education and training, hold free agricultural science and technology training for peasants, improve peasants' cultural level, cultivate peasants' learning awareness of HSFC, and enhance peasants' information acquisition ability. Through various media platforms, we conduct various training activities that are popular with peasants to raise their awareness of HSFC and make them become "participants" in it. The basic information and functions of HSFC are publicized, and training on it is carried out to make peasants fully aware of the importance of their participation in ensuring project quality, adjusting agricultural production methods, and improving the agricultural environment, thus enhancing their subjective awareness and strengthening their perception of the feasibility and necessity of participation and increasing the probability of peasants' participation in HSFC, and thus enhance level of peasants' effective participation in HSFC.

6.3. Research Shortcomings and Prospects

Our study provides new evidence for improving the level of peasants' effective participation in HSFC. However, the paper still has some shortcomings.

Firstly, in the process of selecting influencing factors for the level of peasants' effective participation in HSFC, this study selected variables related to government support and social network according to the embedded social structure theory, previous studies of scholars and considering the purpose of this study. Since the perspective cannot cover all aspects, there may be some other factors affecting the level of peasants' effective participation, which is not taken into account in this study and deserves further research and verification. In the future, it is quite necessary to improve and expand the factors affecting the level of peasants' effective participation in HSFC from multiple perspectives and directions.

Secondly, this study examines peasants as a whole in order to study their participation in HSFC, without discussing the differences in the effective participation of different types of peasants in HSFC. In the future, it is necessary to analyze the specific differences in the effective participation of different types of peasants in HSFC and the causes of the differences.

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