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# How Do Heterogeneous Land Development Opportunities Affect Rural Household Nonfarm Employment: A Perspective of Spatial Regulation

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**Abstract:** Heterogeneous land development opportunities induced by spatial regulation produce different advantages in areas, which undoubtedly differentiates farmers' employment. The aim of this study was to quantitatively examine its impact. We selected Moshui Lake City Park (urban development planning area), Sino-French Eco-City (industrial development planning area), and Chenhu International Wetland (ecological protection planning area) as its principal research areas. These regions are all located in Wuhan city, Hubei province, China. After obtaining 907 valid responses from rural households, the Tobit model was adopted to identify the impact of land development opportunities on farmers' nonfarm employment. The results show that, first, industrial development opportunity (IDO) and urban development opportunity (UDO) provide more job security than the reference group, which is ecological development opportunity (EDO), with the estimated coefficients of IDO and UDO being 0.325 and 0.944, respectively. However, a negative correlation was found between UDO and farmers' employment selection and income. Second, heterogeneity analysis reveals that the promotion effect of land development opportunities on farmers' employment is more significant for low- and middle-income, low-quantity, and high-quality households. Finally, further analysis shows that IDO can promote employment for all age groups, but UDO inhibits the elderly labor force from getting employed. These findings provide evidence-based insights which can enable the government to formulate land value-added distribution systems that promote balanced development between regions and stakeholders.

**Keywords:** land development opportunities; spatial regulation; rural household; nonfarm employment



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## 1. Introduction

Spatial regulation is an important policy instrument worldwide. It can be used to guide rational utilization of land resources for synergic development of the regional resource environment economy [1–4]. On the one hand, zoning regulation can realize the optimal allocation of land resources in accordance with their regional resource endowment and comparative advantage. On the other hand, it results in heterogeneous land development opportunities of nonagricultural development or resource protection for rural areas, either at present or in the future. Land resources are the material basis and spatial support for the survival and development of rural households. Hence, the differences in land allocation efficiency and utilization modes caused by development opportunities [5,6] have, to a certain extent, directly affected the livelihood strategies and nonfarm employment status of farmers. However, very little is known about their linkages in empirical analysis.

We use the notion of the sustainable livelihood framework in this paper to place the nonfarm employment behavior of rural households in a wider socioeconomic and geographical context. Because of its focus on the relationship between land development opportunities and farmers' nonfarm employment status, two strands of literature are

directly relevant for the empirical analysis of this paper. Empirical evidence suggests that nonfarm activities have emerged as a major source of income and employment in many developing countries, especially for the asset-poor rural population [7]. Since its reform and opening up, the proportion of nonfarm employment of the rural labor force in China has been increasing [8,9]. It plays an increasingly important role in farmers' income growth and rural development, and the urban–rural gaps have subsequently narrowed [10,11]. Many factors influence the employment decisions of rural households, including livelihood capital, urban expansion, geographical location, farmland endowment, and so on [7,10,12–14]. However, there is still relatively little empirical literature to show how heterogeneous opportunities of land development affect the nonfarm employment decisions or behavior of rural households from the perspective of spatial regulation.

Many scholars [2,15–21] have studied the different types of spatial regulation zones and have found that spatial regulation has led to "windfalls" or "wipeouts" in the socioeconomic development and individual welfare levels in heterogeneous development planning zones. Studies have shown that farmland preservation can lead to the phenomenon of wipeout loss in the welfare of stakeholders in restricted development zones [2,15–17]. Surveys conducted in protected areas have suggested that households around nature reserves have divergent resource utilization behaviors and off-farm employment opportunities due to the different degree of land development constraints and distance from employment markets and roads [18,19]. Because the intensity of land development is different in restricted development zones and key development zones, the corresponding land value and land income of rights are different [20]. This promotes rapid economic development of unrestricted development areas. Surveys such as that conducted by Yu and Cai [21] have shown that territorial spatial regulation promoted a 2.4% and 1.1% economic growth of municipal districts and counties in key development zones. A large volume of studies have described the role of spatial regulation on socioeconomic development, livelihood patterns, and welfare of rural households in heterogeneous development zones (e.g., key development zones, ecological function zones, and prime farmland protection zones), which were mainly conducted from the perspective of economic growth, expected utility, and livelihood capital of farmers. In summary, there are a lack of questionnaire surveys and quantitative measures of the nonfarm employment status of rural households in different planning areas with heterogeneous opportunities of land development. The aim of this paper is to provide empirical evidence for the claim that land development opportunities affect farmers' nonfarm employment status.

We have selected three cases—Moshui Lake City Park (MLCP), Sino-French Eco-City (SFEC), and Chenhu International Wetland (CIW)—as typical planning areas for urban development, industrial development, and ecological protection. Questionnaire surveys were conducted, and we obtained 907 valid responses from rural households. Methodologically, our empirical analysis is supported by the Tobit model. This model allows for restricted values (between 0 and 1) [22]. We analyze the impact of heterogeneous land development opportunities on farmers' employment status from the perspective of selection, income, and security. We further explore its effects for households with different income levels, human capital endowments, and labor force of different ages. Compared with the existing studies, the contribution of our study is that it quantifies and reveals the impact of heterogeneous land development opportunities of urban development, industrial development, and ecological protection on farmers' employment. This not only provides a new connotation for the study of farmers' employment behavior, but it also helps to provide a reference which can enable the government to establish land value-added distribution systems to promote backward agricultural areas and narrow the regional wealth gap.

## 2. Theoretical Analysis and Research Hypotheses

Spatial regulation is an important policy instrument that the government can use to guide the direction, intensity, and spatial layout of land resource utilization [23]. It contributes to the realization of the multiple goals of national food security, ecological

environment construction, and sustainable economic growth [24–26]. Theoretically, any piece of land has equal development opportunities. However, imbalanced land development opportunities characteristically arise due to the different planning positions of the region [3]. Land resources, as spatial support and the advantage of rural development, have become key elements to stimulate rural development vitality [27,28]. Hence, the differences in exploitative intensity and value manifestation of land resources caused by development opportunities could have resulted in divergent external conditions among rural areas.

We use the notion of the sustainable livelihood in this paper to underscore how external conditions (imbalanced land development opportunities) have affected local livelihood strategies (nonfarm employment status). Even if the themes mentioned above do not provide a ready-made conceptual framework to guide our research, they intersect in several ways that are relevant to our study. First, there is a great deal of literature on the relationship between spatial regulation and economic development. Several lines of evidence suggest that development-oriented planning could promote regional economic growth [21,29–31]. Meanwhile, restricted development zones bear excessive responsibility for farmland protection and ecological conservation, and there are prohibition and restriction policies on industrial development [20,29]. This further limits local economic development. The second body of literature explores the relationship between economic development and household livelihood. Surveys such as that conducted by Sheng et al. [21] have shown that rapid urban growth contributed to creating nonfarm employment for rural labor. In addition, there is a large volume of published research describing the role of structural transformation and its induced economic development in pulling rural labor out of the agricultural sector [7,32–34]. Our study relies in part on the sustainable livelihood framework. Household livelihood strategies are viewed as a response to the external conditions induced by spatial regulation.

At the micro level, nonfarm activities of rural households are influenced by many factors, such as employment opportunities, willingness to work, information access, commuting convenience, vocational skill, and so on. Spatial regulation, considered as policy shock in the sustainable livelihood framework, brings imbalanced land development which leads to the "windfall-wipeout dilemma" of the region and stakeholders [24]. In terms of regional development, there are substantial added land values from spatial regulation [35], such as good surrounding environment, sound infrastructure, social services, public facilities, and industrial agglomeration, in unrestricted development zones. Therefore, industries tend to be distributed in development-oriented regions, and there are numerous job opportunities. Households in unrestricted development zones can obtain the land value increment from the transfer of property rights (such as agricultural land acquisition, homestead expropriation), as well as the unearned added value from externalities of land development. This affects household livelihood asset accumulation and its intrinsic motivation.

Because of the improvement of public infrastructure, information sharing, and communication convenience in unrestricted development zones, there is a positive impact on the access to employment information, commuting convenience, and vocational skill of farmers [10,36]. Farmers in unrestricted development zones are more likely to find nonfarm employment, and the wage income and employment security would be correspondingly improved. According to different spatial regulation policies, unrestricted development zones can be divided into urban development zones and industrial development zones, with the development mode of urban development and industrialized town, respectively. Although both belong to the development-oriented planning area, the land value increments from property transfer and externality in urban development zones are more significant. Obtaining excessive unearned land value increments may have a negative impact on the intentions of farmers to get employed, thus negatively affecting the acquisition of wage income. This finding was also reported by Qiu [37] and Gui [38]. Compared with industrial development zones, farmers in urban development zones receive a large amount of cash, housing compensation, and collective dividends due to land redevelopment [39]. The

wage income is no longer the main source of family income, and the welfare and security of employment become a priority for households. Accordingly, the following research hypotheses are proposed, and the theoretical framework is shown in Figure 1.

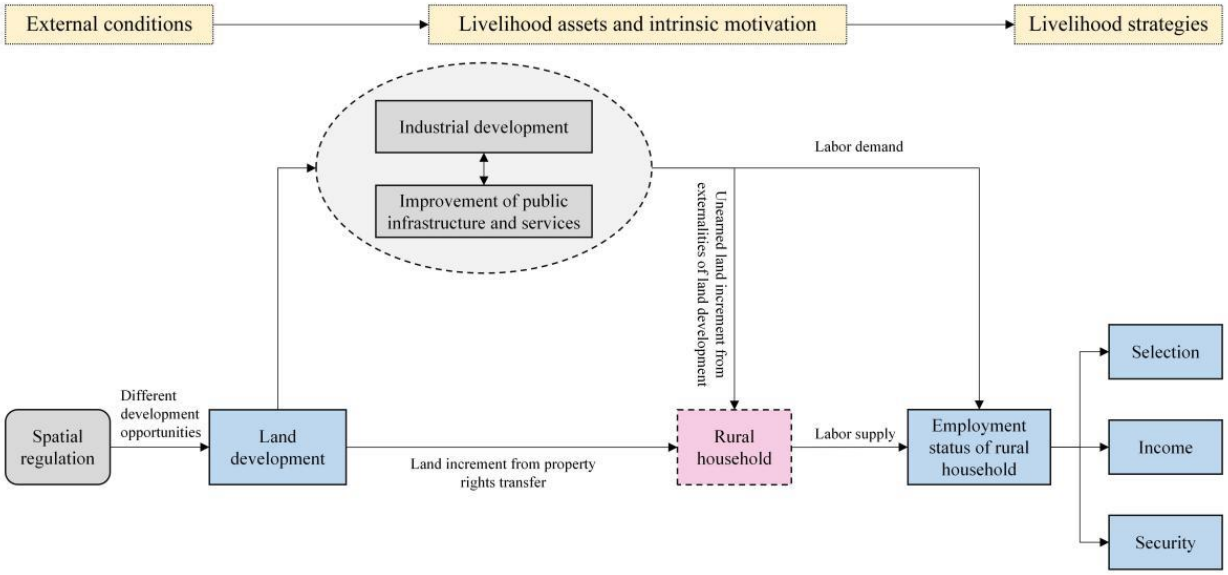


**Figure 1.** The theoretical framework.

**Hypothesis 1:** *Rural households in industrial development planning zones have the highest proportion of labor employed and wage income, followed by ecological reserves, and the lowest is in urban development zones.*

**Hypothesis 2:** *When there are more opportunities for land development, the levels of household employment security are higher; that is, the highest proportion of household formal employment is in urban development areas and the lowest is in ecological protection areas.*

## 3. Study Site, Variables, and Methods

### *3.1. Study Site and Data Source*

#### 3.1.1. Introduction to the Study Site

Wuhan city (29°58′~31°22′ N, 113°41′~115°05′ E), located in the hinterland of central China, is the capital of Hubei Province and is one of the most important industrial bases and integrated transport hubs in central China. It covers a total area of 8569.15 km$^2$, and the urban built-up area measured about 885.11 km$^2$ in 2021 (Wuhan Bureau of Statistics). The population of permanent residents was about 13.65 million, and the gross domestic product (GDP) was approximately 1771.68 billion yuan (about 257.07 billion USD) in 2021. Wuhan is one of the most rapidly developing cities in China. However, the rapid urban land expansion aggravated arable land loss, environmental pollution, and ecological degradation. To reconcile the contradiction between development and eco-environmental protection, Wuhan is a pilot city for the exploration of territorial spatial regulations and has successively issued a series of imbalanced land development strategies (e.g., basic farmland protection regulations, eco-environmental protection zoning, and urban–rural planning) to guide and control land use. While spatial regulation can ensure national food security and ecological environment construction, the windfall gains from land development and wipeout loss associated with land preservation have led to imbalanced nonagricultural development opportunities for different regions. This may further affect regional economic development and the farmers' livelihood decisions.

We have selected three cases—Moshui Lake City Park (MLCP), Sino-French Eco-City (SFEC), and Chenhu International Wetland (CIW)—as typical planning areas for urban development, industrial development, and ecological protection (Figure 2) to explore the

impact of heterogeneous land development opportunities on rural household employment. MLCP, which was planned for urban development, is located in the central urban district of Wuhan. Its surrounding countryside has almost all been redeveloped for urban construction. MLCP has the highest opportunity for land development. SFEC, which was planned as one of the National Eco-demonstration Areas in 2014, is adjacent to the central urban area of Wuhan and follows the development model of an industrialized town. Land conversion in SFEC is very frequent, but its land development opportunities are less than in MLCP. CIW is a remote lake in Wuhan and also the closest wetland reserve to the metropolis in China, within which the land is mainly used for agricultural cultivation and ecological protection. CIW has the least development opportunities for land because the nonfarm conversion of land is severely restricted. To eliminate the impact of other factors (e.g., natural environment and macroscopic policies) as far as possible, the selected urban development, industrial development, and ecological protection planning areas are all located in the southwest of Wuhan city and are radially distributed from near to far away from the urban center. It should be noted that households in MLCP have been released from agricultural registration due to the redevelopment of urban villages. However, they are still considered to be rural households for comparison and analysis with the rural households in other planning areas, to investigate the impact of urban development planning on farmers' employment status.

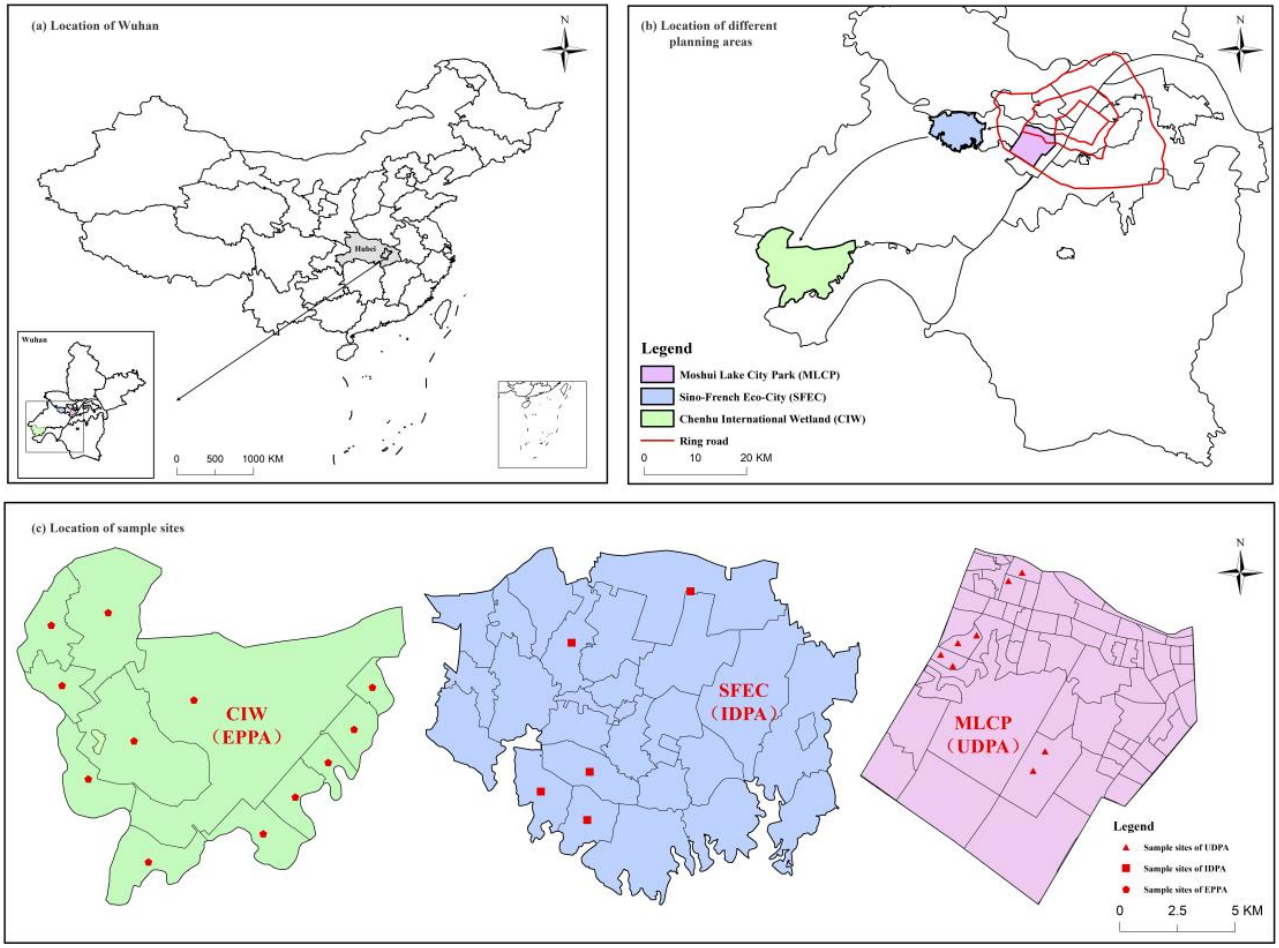


**Figure 2.** Location of the study area. The three survey sites of our study are marked as MLCP, SFEC, and CIW, respectively, by the authors, and represent three different planning areas, viz. urban development planning area (UDPA), industrial development planning area (IDPA) and ecological protection planning area (EPPA).

#### 3.1.2. Data Sources

The data used in this paper were collected by questionnaire survey. Random sampling[1] of the urban development planning area was conducted in July 2019, covering two redevelopment communities of Shilipu and Liyuzhou in MLCP, with eight resettlement neighborhoods. Most of the resettlement neighborhoods are high-rise buildings, so it is difficult and dangerous to conduct a questionnaire-based survey on the interviewee's doorstep. Finally, we had to choose respondents to answer the survey face to face in their doorway, on main roads, or in public spaces. Sampling of the planning areas of industrial development and ecological protection were carried out in May 2021, and included 5 villages of SFEC and 12 villages of CIW, with a sampling ratio of 8% to 10% of the number of permanent households in the villages.

To ensure the reliability of the data, the investigations were completed by about 12 experienced doctoral and master's students of our research group. Several discussions and training were conducted before the field research to deepen the interviewers' understanding of the questionnaire. They were asked to explain the purpose of the investigation in detail to the head of the household or other adults who are familiar with their family situation. After seeking consent from the respondents, we conducted interviews using a standardized questionnaire, and each interview lasted about 40–60 min.

In total, 1067 rural households were interviewed by random sampling, including 425, 298, and 344 households in MLCP, SFEC, and CIW, respectively. Certain prolonged interviews were easily interrupted for various reasons. For the purpose of our study, excluding unfinished or elderly-only surveys, 322, 280, and 305 valid questionnaires were obtained from MLCP, SFEC, and CIW, resulting in a valid response rate of 75.76%[2], 88.66%, and 93.96%, respectively.

The questionnaires were designed following our research questions to capture the basic demographic, employment, and economic characteristics of the household, including age, education, health, occupation, income, and other details. An overview of the characteristics of the surveyed households is as follows: The average age of the household head is 62.118 years old. As for the political status, only 9.4% of the household heads are (CPC) party members. Regarding the family size, the average population of the household is 4.722 persons. More than half (57.0%) of the families have a car, and the average area of farmland is 3.833 mu.

### *3.2. Variables*

#### 3.2.1. Dependent Variables

Referring to the research of Deichmann et al. [7], Giles and Mu [40], and Pan et al. [41], the employment status of rural households is measured in terms of employment selection, employment income, and employment security. Specifically, employment selection is measured by the proportion of labor employed to the total population of household labor. Employment income is estimated by the proportion of wage income to the total household income. Employment security is defined as the proportion of employed labor with welfare securities of five insurance and housing funds or three insurance and housing fund to the total population of labor employed per household. The questionnaire records the employment situation of each family member, from which the household-level employment was counted. It should be noted that in the questionnaire survey, the responses to employment were all given for the previous year.

#### 3.2.2. Independent Variables

The independent variable is the heterogeneous opportunities for land development that is induced by spatial zoning of urban development, industrial development, and ecological protection. According to the possibility of nonagricultural development of land, EPPA, IDPA, and UDPA were assigned 1, 2, and 3, respectively, which were treated as three dummy variables EDO, IDO, and UDO. EDO was left out as the reference category, while IDO and UDO were included in the regressions.

#### 3.2.3. Control Variables

To further reduce the impact of the omitted variables on the results, referring to studies from Xie et al. [9] and Wang et al. [42], the control variables were divided into two dimensions, namely the personal characteristics (household head[3]) and household characteristics. A description of the variables and descriptive statistics is given in Table 1.

**Table 1.** Description of the variables.

| Variables | Variable Descriptions | Total Sample (N = 907) | | EPPA (N = 305) | IDPA (N = 280) | UDPA (N = 322) |
|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | Mean | Mean |
| **Dependent variables** | | | | | | |
| Employment selection | Proportion of labor employed to the total population of household labor (%) | 0.558 | 0.232 | 0.550 | 0.642 | 0.492 |
| Employment income | Proportion of wage income to the total household income (%) | 0.713 | 0.263 | 0.795 | 0.867 | 0.501 |
| Employment security | Proportion of employed labor with security to the total population of labor employed of household (%) | 0.474 | 0.427 | 0.292 | 0.449 | 0.667 |
| **Independent variables** | | | | | | |
| Ecological development opportunity (EDO) | Dummy variable of land development opportunities: EPPA = 1 and others = 0 | 0.336 | 0.473 | 1.000 | 0.000 | 0.000 |
| Industrial development opportunity (IDO) | Dummy variable of land development opportunities: IDPA = 1 and others = 0 | 0.309 | 0.462 | 0.000 | 1.000 | 0.000 |
| Urban development opportunity (UDO) | Dummy variable of land development opportunities: UDPA = 1 and others = 0 | 0.355 | 0.479 | 0.000 | 0.000 | 1.000 |
| **Controlled variables** | | | | | | |
| Head's age | Age of household head (year) | 62.118 | 10.575 | 60.298 | 63.846 | 62.339 |
| Head's education | Education of household head: 1–7 indicating from illiteracy to master or above | 2.510 | 0.929 | 2.472 | 2.400 | 2.643 |
| Head's politics status | Politics status of household head: party member = 1, non-party member = 0 | 0.094 | 0.292 | 0.085 | 0.093 | 0.102 |
| Family size | Population of the household (person) | 4.722 | 1.323 | 4.679 | 4.829 | 4.671 |
| Labor force ratio | Proportion of labor force aged 20 and above with coefficient correction to the total population of household (%) | 0.800 | 0.144 | 0.780 | 0.768 | 0.847 |
| Education of labor force | The average education of people aged 20–69 in the labor force: 1–7 indicating from illiteracy to master or above | 4.596 | 1.214 | 4.325 | 4.511 | 4.929 |
| Health of labor force | The average health of people aged 20–69 in the labor force: 1–5 indicating from worst to best | 4.058 | 0.925 | 4.472 | 4.574 | 3.217 |
| Farmland area | Area of contracted farmland of household (mu) | 3.833 | 5.272 | 9.147 | 2.451 | 0.000 |
| Car | Households who have a car: have = 1, not have = 0 | 0.570 | 0.495 | 0.495 | 0.593 | 0.621 |
| Poverty allowance | Households who accepted poverty allowance: accepted = 1, not accepted = 0 | 0.040 | 0.195 | 0.059 | 0.061 | 0.003 |

### *3.3. Methodology*

Considering that the dependent variable is a continuous variable with censored value (limited dependent variables defined by Tobin [22]), a traditional estimation method such as OLS can lead to different estimates. Referring to the research of Tobin [22], Adesina and Zinnah [43], and Song et al. [44], the Tobit model was adopted to analyze the impact

of heterogeneous land development opportunities on rural household employment. The specific model is as follows:

$$y_i = \beta_0 + \beta_1 x_i + \beta_2 z_i + \mu_i, \mu_i \sim N\left(0, \sigma^2\right) \quad (1)$$

where $y_i$ represents the non-employment status of the rural household, $x_i$ refers to the explanatory variable, $z_i$ represents the other control variable, and $\mu_i$ refers to the stochastic error and distribution in $N(0, \sigma^2)$. $\beta_0$ is the constant term. $\beta_1$ and $\beta_2$ are the regression coefficient of corresponding variables.

## 4. Results

### *4.1. Analysis of the Descriptive Results*

As shown in Table 1, the employment selection (income) of EPPA, IDPA, and UDPA are 55.0% (79.5%), 64.2% (86.7%), and 49.2% (50.1%), respectively. This indicates that nearly half of the household labor force are engaged in an employed job and that wage income is the main source of family income. The employment security of EPPA and IDPA, with the proportion of 29.2% and 44.9%, is much lower than that of UDPA (66.7%). There are differences in the employment status (employment selection, employment income, and employment security) of rural households of these three types of planning area. The household associated with the UDPA had the highest employment security but the lowest selection and income of employment.

### *4.2. Analysis of the Regression Results*

The estimated results are shown in Table 2. Columns (1) (2), Columns (3) (4) and Columns (5) (6) are the estimated results of employment selection, employment income, and employment security, respectively. To be specific, Columns (1), (3), and (5) do not include any control variables, and Columns (2), (4), and (6) add control variables. All the models passed the chi-square test at the 1% significance level, which implies the models fit well. IDO and UDO represent the industrial development opportunity and urban development opportunity, respectively.

The core explanatory variable IDO has a significantly positive influence on the employment selection and employment income of rural households. It shows that compared with farmers in ecological protection zones, farmers in industrial development zones are more likely to get employed and obtain wage income. These results match those observed in earlier studies. Specifically, some scholars [20,35,36] argue that there are more nonfarm employment opportunities in the unrestricted development zone, which contributes to local farmers moving away from farming dependence and achieving nonfarm employment. However, the effect of the core explanatory variable UDO is significantly negative for employment selection and employment income. This finding is consistent with that of Qiu [37] and Gui [38], who found that land rent gains from land development opportunities are not conducive to the improvement of a household's ability to earn a sustainable livelihood. These results verify Hypothesis 1. Rural households in urban development zones have the lowest proportion of labor employed and wage income. A possible explanation is that households in urban development zones have received large amounts of cash, housing compensation, and collective dividend income because of house demolition and renovation [39], so they may have less incentive for finding employment and obtaining wage income. In terms of employment security, the effects of the core explanatory variables IDO and UDO are significantly positive. Furthermore, the estimated coefficient of UDO on employment security (0.944) is much higher than that of IDO (0.325). This shows that land development opportunities have been positive for farmers entering the formal nonfarm employment sector, which indicates that Hypothesis 2 is valid. The consistent positive effect of land development opportunities on employment security could possibly be related to the pursuit of employment stability. As mentioned by Chen and Raveendran [45] and Himanshu et al. [46], the lack of availability of jobs in the formal sector is considered

widespread. In old tradition, there is also a common Chinese saying that states "the golden rice bowl and the silver rice bowl are not as good as the iron rice bowl." Thus, as development opportunities and farmers' economic status increase, households generally pursue stable employment rather than obtaining higher economic income, and labor will hence continue to shift to the formal employment sector.

**Table 2.** Regression results of the impact of heterogeneous land development opportunities on rural household employment.

| Variables | Employment Selection | | Employment Income | | Employment Security | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| IDO | 0.104 *** | 0.111 *** | 0.083 *** | 0.080 *** | 0.542 *** | 0.325 ** |
| | (0.021) | (0.026) | (0.018) | (0.022) | (0.114) | (0.133) |
| UDO | −0.065 *** | −0.057 * | −0.296 *** | −0.320 *** | 1.264 *** | 0.944 *** |
| | (0.021) | (0.034) | (0.018) | (0.029) | (0.124) | (0.183) |
| Head's age | | −0.004 *** | | −0.003 *** | | 0.008 |
| | | (0.001) | | (0.001) | | (0.005) |
| Head's education | | −0.008 | | −0.037 *** | | −0.209 *** |
| | | (0.012) | | (0.011) | | (0.065) |
| Head's politics status | | −0.015 | | −0.016 | | 0.206 |
| | | (0.029) | | (0.025) | | (0.153) |
| Family size | | 0.002 | | 0.011 * | | 0.006 |
| | | (0.007) | | (0.006) | | (0.038) |
| Labor force ratio | | 0.149 ** | | 0.079 | | −0.538 |
| | | (0.067) | | (0.059) | | (0.361) |
| Education of labor force | | 0.055 *** | | 0.070 *** | | 0.638 *** |
| | | (0.014) | | (0.012) | | (0.080) |
| Health of labor force | | 0.028 ** | | 0.010 | | 0.045 |
| | | (0.012) | | (0.011) | | (0.067) |
| Farmland area | | 0.001 | | 0.000 | | −0.007 |
| | | (0.002) | | (0.002) | | (0.012) |
| Car | | 0.052 *** | | 0.000 | | 0.239 *** |
| | | (0.018) | | (0.015) | | (0.092) |
| Poverty allowance | | −0.036 | | −0.169 *** | | −0.054 |
| | | (0.044) | | (0.038) | | (0.241) |
| _cons | 0.556 *** | 0.390 *** | 0.794 *** | 0.694 *** | −0.198 ** | −1.952 *** |
| | (0.015) | (0.118) | (0.013) | (0.103) | (0.085) | (0.654) |
| N | 907 | 907 | 907 | 907 | 907 | 907 |
| Log likelihood | −209.4 | −156.8 | −16.6 | 27.4 | −920.3 | −865.1 |
| Prob > Chi2 | 0 | 0 | 0 | 0 | 0 | 0 |

Notes: ***, **, * represent significance at the 1%, 5%, and 10% level[4], respectively. Bracketed numbers indicate standard error. EDO is regarded as the reference category of IDO and UDO.

The controlled variables, such as family size, education of labor force, health of labor force, and car ownership, present positive effects on household employment. This indicates that households with more and better-quality labor are more likely to get employed and enter the formal nonfarm employment sector. These results are in agreement with those of previous studies [47,48]. The estimated coefficient of poverty allowance on employment income is significantly negative, which suggests that families with allowance support have poor ability to obtain wage income.

### *4.3. Robustness Check*

Robustness check is a common exercise in empirical studies. Referring to Lu and White [49], we can use the following two methods to test the robustness of the estimation results. If the coefficients are plausible and robust, this is commonly interpreted as evidence of structural validity. First, the whole sample was divided into two subsamples: EPPA and IDPA, EPPA and UDPA. The impact of IDO (industrial development opportunity) and UDO (urban development opportunity) on the non-employment status of households was

separately tested by Equation (1). Second, we remeasured the employment status of households by replacing the proportion form to the actual value of employment. Specifically, the dependent variables of employment selection, employment income, and employment security were remeasured by whether the household had a nonfarm job or not, income from employment, and the number of workers with employment security, respectively. Because the three dependent variables are binary, continuous, and orderly variables, the Logit, OLS, and Orderly Logit models were used for estimation, respectively. As seen from Table 3, the significance and signs of the estimated coefficients of IDO and UDO obtained by the robustness checks are almost consistent with the basic regression results, which indicates our results are stable and robust.

**Table 3.** Results of robustness tests.

| Variables | Robustness Tests for Subsamples | | | | | | Robustness Tests for Dependent Variable Replacement | | |
|---|---|---|---|---|---|---|---|---|---|
| | Selection | Income | Security | Selection | Income | Security | Selection | Income | Security |
| IDO | 0.109 *** | 0.085 *** | 0.328 *** | / | / | / | 0.733 | 0.236 *** | 0.953 *** |
| | (0.026) | (0.021) | (0.119) | / | / | / | (0.722) | (0.066) | (0.212) |
| UDO | / | / | / | −0.095 ** | −0.357 *** | 1.047 *** | −1.212 | −0.121 | 1.297 *** |
| | / | / | / | (0.039) | (0.036) | (0.262) | (0.767) | (0.100) | (0.279) |
| Control | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| N | 585 | 585 | 585 | 627 | 627 | 627 | 907 | 907 | 907 |
| Log likelihood | −94.0 | 83.3 | −560.8 | −95.7 | −12.6 | −567.8 | −126.4 | / | −996.2 |
| Prob > Chi2(F) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Notes: *** and ** represent significance at the 1% and 5% level, respectively. Bracketed numbers indicate standard error. EDO is regarded as the reference category of IDO and UDO.

### *4.4. Heterogeneity Analysis*

Heterogeneity analysis is a way to explore how the results of a model can vary depending on sample characteristics [50]. We analyzed the impact of land development opportunities on the farmers' nonfarm employment status. However, the regression results only reflect the overall average effect of the impact and can hardly reveal the possible heterogeneity effects. Rural household differentiation has become a common phenomenon in rural China [51,52]. Divergence has generated difference in the socioeconomic status of farmers and their ability to obtain land value increments from market opportunities and land conversion [46,47]. This leads to heterogeneity in the impact of development opportunities on the employment status of farmers at different income levels. In addition, human capital is also an important endowment resource for farmers, as well as a key factor affecting their employment. This plays an important role for rural households to get employed and enter the formal employment sector. Therefore, it is necessary to examine the heterogeneity impact of land development opportunities on the employment status of rural households, in order to help the government formulate policies and improve the fairness of nonfarm employment opportunities.

#### 4.4.1. Heterogeneity Analysis of Households with Different Income Levels

Rural households were divided into three levels according to their total household income. If the income is lower than a quarter of the sample, then it is considered as a low-income group. If it is higher than three quarters of the sample, then it is regarded as a high-income group. The rest are the middle-income group. The regression results of the subgroups are shown in Table 4.

The estimated coefficients of IDO on employment selection, employment income, and employment security of farmers in middle- and low-income groups are higher than that in high-income groups. The promoting effect of UDO on the employment security of the high-income group (0.361) is much smaller than that of the middle- and low-income groups (1.097 and 2.110). The inhibitory impact of UDO on employment selection and income is more significant for the high-income group. These results indicate that the middle- and low-income groups benefit more from land nonagricultural construction. A

possible reason is that compared with wealthy farmers, households with low and middle income are more likely to take the nonfarm employment opportunities from industrial development. According to Alobo's research [53], access to qualitative employment is often confined to relatively better-off households. Therefore, the high-income groups with superior development capacity could be fully employed or have diversified channels to obtain money. Getting employed is not the main source of household income, and thus, the enhancing impact of land development opportunities on their employment is relatively weak.

**Table 4.** Heterogeneity effect of the impact of heterogeneous land development opportunities on rural household employment.

| Variables | | Households with Different Income Levels | | | Households with Different Human Capital Endowments | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Human Capital Quantity | | Human Capital Quality | |
| | | Low-Income Group | Middle-Income Group | High-Income Group | Low-Quantity Group | High-Quantity Group | Low-Quality Group | High-Quality Group |
| Selection | IDO | 0.108 * | 0.142 *** | 0.076 | 0.095 ** | 0.127 *** | 0.072 ** | 0.154 *** |
| | | (0.060) | (0.031) | (0.051) | (0.042) | (0.032) | (0.035) | (0.038) |
| | UDO | −0.008 | −0.036 | −0.239 *** | −0.042 | −0.061 | −0.108 ** | −0.021 |
| | | (0.073) | (0.041) | (0.071) | (0.056) | (0.042) | (0.046) | (0.050) |
| | Control | YES | YES | YES | YES | YES | YES | YES |
| | N | 228 | 450 | 229 | 404 | 503 | 434 | 473 |
| | Prob > Chi2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Income | IDO | 0.176 *** | 0.058 ** | 0.020 | 0.109 *** | 0.054 ** | 0.062 ** | 0.098 *** |
| | | (0.067) | (0.023) | (0.045) | (0.038) | (0.026) | (0.030) | (0.033) |
| | UDO | −0.238 *** | −0.343 *** | −0.444 *** | −0.245 *** | −0.366 *** | −0.368 *** | −0.300 *** |
| | | (0.082) | (0.031) | (0.063) | (0.051) | (0.034) | (0.039) | (0.044) |
| | Control | YES | YES | YES | YES | YES | YES | YES |
| | N | 228 | 450 | 229 | 404 | 503 | 434 | 473 |
| | Prob > Chi2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Security | IDO | 1.212 ** | 0.464 ** | −0.033 | 0.416 * | 0.260 * | 0.432 | 0.276 ** |
| | | (0.592) | (0.197) | (0.136) | (0.250) | (0.152) | (0.316) | (0.128) |
| | UDO | 2.110 *** | 1.097 *** | 0.361 * | 1.358 *** | 0.695 *** | 1.418 *** | 0.707 *** |
| | | (0.751) | (0.276) | (0.196) | (0.359) | (0.205) | (0.434) | (0.180) |
| | Control | YES | YES | YES | YES | YES | YES | YES |
| | N | 228 | 450 | 229 | 404 | 503 | 434 | 473 |
| | Prob > Chi2 | 0.0001 | 0 | 0 | 0 | 0 | 0 | 0 |

Notes: ***, **, * represent significance at the 1%, 5%, and 10% level, respectively. Bracketed numbers indicate standard error. EDO is regarded as the reference category of IDO and UDO.

#### 4.4.2. Heterogeneity Analysis of Households with Different Human Capital Endowments

The quantity and education level of the labor force are important indicators to reflect the human capital endowment of rural households [48]. In this paper, we analyze the possible heterogeneity of the impact of land development opportunities on farmers' employment from the two dimensions of quantity and education of labor force (Table 4). According to the sample's mean and the practical significance, the sample was divided into low-quantity and high-quantity groups (the number of labor force $\leq$ 3.5 and >3.5), and low-quality and high-quality groups (the average education level of the labor force $\leq$ junior high school and >junior high school), respectively, for grouping regression.

In terms of the heterogeneous effect of human capital quantity, the core explanatory variable IDO has a more significantly positive effect on employment income and employment security of the low-quantity group, and employment selection of the high-quantity group. Meanwhile, the inhibitory effect of UDO on employment selection and employment income is more obvious for high-quantity groups, and the promotion effect on employment security is more obvious for low-quantity groups. These results suggest that the low-quantity groups benefit more from the driving effect of land development opportunities on employment. This outcome is contrary to that of LV et al. [54], who found that the number of the labor force has a positive effect on the transfer of labor force to nonfarm employment. It seems possible that high-quantity households are less inclined to accept the nonagricultural employment opportunities generated from increased land development because of having more labor force to rely on to bear the financial pressure of family development.

In terms of the heterogeneous effect of human capital quality, the estimated coefficients of IDO on farmers' employment selection and employment income are higher for the high-quality group. Meanwhile, both the inhibitory effect of UDO on employment selection

and employment income and the promotion effect of UDO on employment security are more obvious for low-quality groups. These results show that high-quality groups benefit more from the driving force of industrial development opportunity on employment. This is consistent with the findings that highly educated farmers are more inclined to get employed and obtain higher wages [9,47]. Unexpectedly, it was found that the impact of urban development opportunity on employment security is more beneficial for low-quality groups. The probable cause of this is that high-quality groups were fully employed in the formal employment sector and had obtained employment security, and thus, the enhancing impact on their employment security was relatively weak.

### *4.5. Further Analysis*

To understand the impact of land development opportunities on the employment of the labor force of different ages, the labor force is further divided into young (20–39 years old), middle-aged (40–59 years old), and elderly (≥60 years old) labor force for analysis by referring to the research of Luo Chun [55] (Table 5). The research of Yeboah and Jayne [56] noted the importance of nonfarm employment for labor force of different ages. The estimated coefficients of IDO on employment (selection, income, and security) of different age groups are all positive, with the highest estimated coefficients for employment income and employment security of the middle-aged labor force. This indicates that industrial development opportunity can promote the employment of labor force of all ages, especially for the middle-aged labor force. The estimated coefficients of UDO on the employment security of the young and middle-aged labor force are 2.795 and 4.503, respectively, which are significant at the level of 5% and 1%. However, the impact of UDO on employment selection and income of the elderly labor force is significantly negative. A possible explanation for this is that households in the urban development planning area receive property income such as collective dividend income and house rent revenue, which alleviates the pressure on the elderly labor force to get employed to support the family's development.

**Table 5.** Results of the impact of heterogeneous land development opportunities on the employment of labor force of different ages.

| Variables | Young Labor | | | Middle-Aged Labor | | | Elderly Labor | |
|---|---|---|---|---|---|---|---|---|
| | Selection | Income | Security | Selection | Income | Security | Selection | Income |
| IDO | 0.835 ** | 0.175 * | 2.194 ** | 0.804 *** | 0.456 *** | 2.462 *** | 0.631 *** | 0.206 *** |
| | (0.407) | (0.105) | (0.878) | (0.212) | (0.114) | (0.759) | (0.245) | (0.073) |
| UDO | 0.516 | −0.037 | 2.795 ** | 0.311 | 0.143 | 4.503 *** | −1.577 *** | −0.259 *** |
| | (0.518) | (0.142) | (1.156) | (0.266) | (0.156) | (1.091) | (0.399) | (0.082) |
| Control | YES | YES | YES | YES | YES | YES | YES | YES |
| N | 727 | 727 | 727 | 694 | 694 | 694 | 649 | 649 |
| Log likelihood | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Prob > Chi2(F) | 0.0303 | 0.0868 | 0.0752 | 0.0867 | 0.2223 | 0.1708 | 0.1337 | 0.1444 |

Notes: ***, **, * represent significance at the 1%, 5%, and 10% level, respectively. Bracketed numbers indicate standard error. EDO is regarded as the reference category of IDO and UDO.

## 5. Discussion

In the context of building a territorial spatial regulation system of ecological protection, food security, and economic development in the new era, unbalanced rights and unequal index distribution of land development between restricted and unrestricted development zones are absolute. It results in imbalanced regional land development, and stakeholders' windfall gains and wipeout loss [2,3,15–21]. These problems have generally been recognized by most countries. Thereby, various initiatives, such as the transfer of development rights, land taxation, and planning gains, have been adopted by the United States, the United Kingdom, Sweden, and other countries to capture the added values of land [57–59]. However, ecological compensation, special funds, and other transfer payment means have been simply adopted in China to compensate backward ecological function

areas. No measures have been appropriately taken to capture the externality of land value appreciation due to spatial regulation [60]. Our study is of great significance for providing evidence-based insights which can enable the government to tackle the problem of imbalanced regional development resulting from spatial regulation.

We found evidence for job creation in off-farm employment activities resulting from land development in unrestricted planning areas. This finding is consistent with that of Wang et al. [20], who found that the field of nonagricultural employment is relatively narrow in restricted development zones. Moreover, Wu et al. [35], Song [48], and Li et al. [61] have shown that development opportunities largely determine the livelihood strategies of local residents. Another interesting finding is that the employment-enhancing effect that is caused by increased land development opportunities is more beneficial for low-income groups to obtain wage income. This has a positive impact on reducing the income inequality of farmers in unrestricted development zones. These results agree with the idea of other studies [62,63], in which the nonfarm employment opportunities resulting from land development are found to promote the full employment of low-income groups.

It is worth noting that the pace of urbanization and industrial development has accelerated in unrestricted development zones following the promotion of large-scale land development. Local rural households can realize land property income through housing demolition compensation and housing rental, and the value of land assets in the development zones is gradually rising. Households with higher initial wealth accumulation may benefit significantly from land value increment due to the advantages of social capital and human capital. This exacerbates the property income gap among families. For example, Yang and Cai [39] found the phenomenon of elite capture in urban village redevelopment; that is, families with higher social status received relatively more housing compensation.

## 6. Conclusions and Policy Recommendations

Spatial regulation produces different advantages in areas with different land resource endowments [20]. It affects regional economic growth and coordinated development, which has been confirmed by many academic studies [3,21,64,65]. At the level of farmers, the impact of land development opportunities on farmers' employment under differentiated spatial regulation systems should be strongly considered. We first discuss that the driving force for farmers' employment comes from land development opportunities. The main conclusions are as follows. First, industrial development opportunity (IDO) and urban development opportunity (UDO) have a significant positive effect on households obtaining employment security. However, a negative correlation was found between UDO and farmers' employment selection and income. This implies that obtaining a great deal of unearned land increments in urban development planning areas tends to damage the family's willingness to find employment. Second, IDO and UDO have a more significant promotion effect on the employment of low- and middle-income households. This suggests that land development opportunities may have a positive impact on reducing the wage income inequality of farmers in unrestricted planning areas. Finally, further analysis found that industrial development opportunity has the greatest enhancing effect on employment of the middle-aged labor force, but urban development opportunity inhibits employment of the elderly labor force.

The disparity in employment opportunities and welfare caused by institutional and policy factors is regarded as an unjust inequality. The difference in land development opportunities caused by spatial regulation is exactly the external factor that affects farmers' willingness to be employed. The insights gained from this study may be of assistance for the government to formulate land value-added distribution systems and employment support policies that promote balanced development between regions and stakeholders. The following policy implications are proposed. First, it is necessary to accelerate the construction of a shared mechanism for transferring added land values to restricted development zones, such as ecological protection compensation, to solve the "windfall-wipeout dilemma" of regions and stakeholders. Therefore, all farmers can share the benefits of modernization

and achieve common prosperity. Second, it is recommended that the government should support ecological reserves through fiscal policies, such as employment skills training for farmers, rural public service investment, infrastructure construction, and so on. In particular, vocational training and careers guidance should be provided for poor groups in restricted development zones to prevent low-income groups from remaining locked in the poverty trap of development.

A number of limitations need to be noted regarding the present study. First, external factors such as location, resource endowment, and macroenvironment may influence the development orientation of a region. Meanwhile, these factors are also important determinants of the employment status of rural households. To compare the differences in the employment status of rural households among different planning areas, other influencing factors were controlled as far as possible in the selection of study sites to obtain reliable research conclusions. However, this research is not a quasi-natural experiment, and no inference of causality can be obtained. Second, due to objective constraints, this research was not conducted in the same year, and the dependent variables were set to be characterized as percentages to reduce the impact of inflationary effects on the study.

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## Notes

[1] Random sampling means that each rural household in the study site has an equal chance to be selected.

[2] The survey in UDPA was not carried out in the residence of the interviewees, and there were many cases where interviewees refused to continue the survey due to requests for sensitive information, so the efficiency of the survey questionnaire in this area is relatively low.

[3] Household head refers to the head of the family on the household register.

[4] Significance test is used to determine if the difference between the assumed value in the null hypothesis and the value observed from the experiment is large enough to reject the possibility that the result was a purely chance process.

## References

1. Rogatka, K.; Starczewski, T.; Kowalski, M. Urban resilience in spatial planning of polish cities-True or false? Transformational perspective. *Land Use Policy* **2021**, *101*, 105172. [CrossRef]
2. Gardner, B.D. The economics of agricultural land preservation. *Am. J. Agric. Econ.* **1977**, *59*, 1027–1036. [CrossRef]
3. Cai, Y.Y.; Zhang, A.L. Researching trends of prime farmland's economic compensation under land use planning control. *China Popul. Resour. Environ.* **2010**, *20*, 102–106.
4. Qiu, Y.; Zhou, A.G.; Li, M.H.; Guo, Y.X.; Cui, H.; Ma, C.M. Territorial spatial usage regulation based on resources endowment and sustainable development: A case of Wuhan, China. *J. Clean. Prod.* **2023**, *385*, 135771. [CrossRef]
5. Fuseini, I.; Kemp, J. A review of spatial planning in Ghana's socio-economic development trajectory: A sustainable development perspective. *Land Use Policy* **2015**, *47*, 309–320. [CrossRef]
6. Liu, Y.; Zhou, Y. Territory spatial planning and national governance system in China. *Land Use Policy* **2021**, *102*, 105288. [CrossRef]
7. Deichmann, U.; Shilpi, F.; Vakis, R. Urban proximity, agricultural potential and rural non-farm employment: Evidence from Bangladesh. *World Dev.* **2009**, *37*, 645–660. [CrossRef]
8. Tian, C.H.; Li, M.K. The impact of land market development on labor non-agricultural employment: Based on the experience of Zhejiang, Hubei, and Shaanxi. *J. Agrotech. Econ.* **2014**, *8*, 11–24. [CrossRef]
9. Xie, X.X.; Deng, Y.; Liu, J.Y.; Lu, W.N.; Zhao, M.J. Impact of fallow on off-farm employment of farmers. *Resour. Sci.* **2021**, *42*, 280–292. [CrossRef]
10. Sheng, Y.; Zhao, Y.H.; Zhang, Q.; Dong, W.L.; Huang, J.K. Boosting rural labor off-farm employment through urban expansion in China. *World Dev.* **2022**, *151*, 105727. [CrossRef]

11. Hu, Y.; Zhang, Z.H. The Influence of Vocational Training on Farmers' Off-farm Employment Behavior and Characteristics: Net Effect Estimation Based on Endogenous Treatment Effect Model. *Reform* **2022**, *338*, 110–126.
12. Laszlo, S. Education, labor supply, and market development in rural Peru. *World Dev.* **2008**, *36*, 2421–2439. [CrossRef]
13. Xin, L.; Jiang, H.P. Rural labor force' non-agricultural employment and its impact factor analysis: Based on the survey of 1006 rural labors in Sichuan Province. *J. Agrotech. Econ.* **2009**, *6*, 19–25.
14. Zhou, B.; Chen, Z.J. The impact of agricultural factors on rural households' non-agricultural employment. *J. Agrotech. Econ.* **2011**, *4*, 19–24.
15. Thompson, D.D. An externality from governmentally owned property may be a nuisance or even a taking. In *Windfalls for Wipeouts: Land Value Capture and Compensation*; Planner Press: Washington, DC, USA, 1987; pp. 203–221.
16. Cai, Y.Y.; Yu, Y. The restriction of farmers' land development rights under prime farmland planning control. *China Popul. Resour. Environ.* **2012**, *22*, 76–82.
17. Zhu, L.L.; Cai, Y.Y. Regional differences of restriction on farmland development rights under land-use regulation and the economic compensation: Cases in Wuhan, Jingmen and Huanggang, Hubei Province. *J. Nat. Resour.* **2015**, *30*, 736–747.
18. Clements, T.; Suon, S.; Wilkie, D.S.; Milner-Gulland, E.J. Impacts of Protected Areas on Local Livelihoods in Cambodia. *World Dev.* **2014**, *64*, S125–S134. [CrossRef]
19. Duan, W.; Hogarth, N.J.; Shen, J.Y. Impacts of Protected Areas on Income Inequality: Evidence from the Giant Panda Biosphere Reserves in Sichuan Province, China. *J. For. Econ.* **2021**, *36*, 27–51. [CrossRef]
20. Wang, H.; Cheng, P.; Liang, P.P.; Liu, K.; Nie, X. Invisible windfalls and wipeouts: What is the impact of spatial regulation on the welfare of land-lost farmers? *Habitat Int.* **2020**, *99*, 102159. [CrossRef]
21. Yu, L.L.; Cai, Y.Y. Effects of national spatial planning to economic growth in key development areas: Evidence from the planning of Wuhan Urban Agglomeration. *China Popul. Resour. Environ.* **2016**, *26*, 101–109.
22. Tobin, J. Estimation of Relationships for Limited Dependent Variables. *Econometrica* **1958**, *26*, 24–36. [CrossRef]
23. Zhu, D.L.; Zhang, L.X.; Yun, W.J. Logic and Regulation of Planning Governance: Balance between Public Power and Private Rights. *Planners* **2021**, *37*, 19–22.
24. Cao, R.F.; Zhang, A.L.; Cai, Y.Y.; Xie, X.X. How imbalanced land development affects local fiscal condition? A case study of Hubei Province, China. *Land Use Policy* **2020**, *99*, 105086. [CrossRef]
25. Li, Y.H.; Li, Y.; Westlund, H.; Liu, Y.S. Urban-rural transformation in relation to cultivated land conversion in China: Implications for optimizing land use and balanced regional development. *Land Use Policy* **2015**, *47*, 218–224. [CrossRef]
26. Chen, L.; Jiang, H. Land resource spatial allocation under the guidance of main functional areas: Rational thinking on the evolution discipline of land development. *China Land Sci.* **2019**, *33*, 22–30.
27. Woods, M. Rural cosmopolitanism at the frontier? Chinese farmers and community relations in northern Queensland, c. 1890–1920. *Aust. Geogr.* **2018**, *49*, 107–131. [CrossRef]
28. Yang, R.; Lin, Y. Rural spatial transformation and governance from the perspective of land development rights: A case study of Fenghe village in Guangzhou. *Growth Chang.* **2022**, *53*, 1102–1121. [CrossRef]
29. Cao, R.F.; Zhang, A.L. Measurement and sensitivity analysis of unbalance degree of land development: From the perspective of farmland development restriction. *J. Nat. Resour.* **2017**, *32*, 715–726. [CrossRef]
30. He, Q.S.; He, W.S.; Song, Y.; Wu, J.Y.; Yin, C.H.; Mou, Y.C. The impact of urban growth patterns on urban vitality in newly built-up areas based on an association rules analysis using geographical 'big data'. *Land Use Policy* **2018**, *78*, 726–738. [CrossRef]
31. Huang, X.J.; Huang, X.; He, Y.B.; Yang, X.J. Assessment of livelihood vulnerability of land-lost farmers in urban fringes: A case study of Xi'an, China. *Habitat Int.* **2017**, *59*, 1–9. [CrossRef]
32. Cravino, J.; Sotelo, S. Trade-induced structural change and the skill premium. *Am. Econ. J. Macroecon.* **2019**, *11*, 289–326. [CrossRef]
33. Uy, T.; Yi, K.M.; Zhang, J. Structural change in an open economy. *J. Monet. Econ.* **2013**, *60*, 667–682. [CrossRef]
34. Choithani, C.; van Duijne, R.J.; Nijman, J. Changing livelihoods at India's rural–urban transition. *World Dev.* **2021**, *146*, 105617. [CrossRef]
35. Wu, J.Y.; Wu, G.F.; Kong, X.Y.; Luo, Y.L.; Zhang, X.B. Why should landowners in protected areas be compensated? A theoretical framework based on value capture. *Land Use Policy* **2020**, *95*, 104640. [CrossRef]
36. Gibson, J.; Olivia, S. The effect of infrastructure access and quality on non-farm enterprises in rural Indonesia. *World Dev.* **2010**, *38*, 717–726. [CrossRef]
37. Qiu, Y. Land development right allocation and farmer's citizenship dilemma: Analysis of anti-urbanization behavior of farmers in The Pearl River Delta. *Issues Agric. Econ.* **2020**, *11*, 42–54. [CrossRef]
38. Gui, H. Ways of land development and process of population urbanization: Comment on Land Expropriation System Reform. *J. Huazhong Agric. Univ. (Soc. Sci.)* **2019**, *1*, 155–161+170. [CrossRef]
39. Yang, Q.; Cai, Y.Y. Housing property redistribution and elite capture in the redevelopment of urban villages: A case study in Wuhan, China. *J. Clean. Prod.* **2020**, *262*, 121192. [CrossRef]
40. Giles, J.; Mu, R. Village Political Economy, Land Tenure Insecurity and the Rural to Urban Migration Decision: Evidence from China. *Am. J. Agric. Econ.* **2018**, *100*, 521–544. [CrossRef]
41. Pan, M.M.; Cai, S.K.; Zhou, Y. Has Internet Use Promoted Non-agricultural Employment for rural Women? Empirical Research Based on the Survey Data of Jiangsu, Anhui, Henan and Hubei. *J. Agrotech. Econ.* **2021**, *316*, 133–144. [CrossRef]

42. Wang, X.S.; Guo, Z.X.; Li, N.; Xu, H.Z. The impact of land acquisition on farmers' employment and welfare: An empirical analysis using CHIP data. *J. Public Manag.* **2019**, *16*, 153–168+176. [CrossRef]
43. Adesina, A.A.; Zinnah, M.M. Technology characteristics, farmers' perceptions and adoption decisions: A Tobit model application in Sierra Leone. *Agric. Econ.* **1993**, *9*, 297–311. [CrossRef]
44. Song, Y.; Yeung, G.; Zhu, D.L.; Xu, Y.; Zhang, L.X. Efficiency of urban land use in China's resource-based cities, 2000–2018. *Land Use Policy* **2022**, *115*, 106009. [CrossRef]
45. Chen, M.A.; Raveendran, G. Urban employment in India: Recent trends and patterns. *Margin: J. Appl. Econ. Res.* **2012**, *6*, 159–179. [CrossRef]
46. Huffman, W. Farm and off-farm Work Decisions: The Role of Human Capital. *Rev. Econ. Stat.* **1980**, *62*, 14–23. [CrossRef]
47. Yang, J.F.; Shi, J.T. The influence of human capital on non-farm employment: A literature review. *China Rural Surv.* **2006**, *3*, 74–79.
48. Song, J.H.; Wu, H.T.; Cheng, W.T. Labor Endowment, Non-agricultural Employment and Relative Poverty. *J. Huazhong Agric. Univ. (Soc. Sci.)* **2022**, *157*, 64–74. [CrossRef]
49. Lu, X.; White, H. Robustness checks and robustness tests in applied economics. *J. Econom.* **2014**, *178*, 194–206. [CrossRef]
50. Bonnini, S.; Corain, L.; Marozzi, M.; Salmaso, L. *Tests for Heterogeneity*; Wiley Series in Probability and Statistics: Hoboken, NJ, USA, 2014; pp. 176–199. [CrossRef]
51. Liu, R.; Yu, C.; Jiang, J.; Huang, Z.B.; Jiang, Y.M. Farmer differentiation, generational differences and farmers' behaviors to withdraw from rural homesteads: Evidence from chengdu, China. *Habitat Int.* **2020**, *103*, 102231. [CrossRef]
52. Long, H.L.; Tu, S.S.; Ge, D.Z.; Li, T.T.; Liu, Y.S. The allocation and management of critical resources in rural China under restructuring: Problems and prospects. *J. Rural Stud.* **2016**, *47*, 392–412. [CrossRef]
53. Alobo Loison, S. Rural livelihood diversification in sub-Saharan Africa: A literature review. *J. Dev. Stud.* **2015**, *51*, 1125–1138. [CrossRef]
54. Lv, P.L.; Feng, S.Y.; Wang, B.; Qu, F.T. Farming households' decision of farmland and rural labor allocation and influencing factors. *Resour. Sci.* **2022**, *44*, 1577–1588. [CrossRef]
55. Luo, C. Re-partitioning population age group and its implications. *Popul. Res.* **2017**, *41*, 16–25.
56. Yeboah, F.K.; Jayne, T.S. Africa's evolving employment trends. *J. Dev. Stud.* **2018**, *54*, 803–832. [CrossRef]
57. Jou, J.B.; Lee, T. Taxation on Land Value and Development When There Are Negative Externalities from Development. *J. Real Estate Financ. Econ.* **2008**, *36*, 103–120. [CrossRef]
58. Linkous, E.R. Transfer of development rights in theory and practice: The restructuring of TDR to incentivize development. *Land Use Policy* **2016**, *51*, 162–171. [CrossRef]
59. Tian, L. *Betterment and Compensation under the Land Use Rights System: A Perspective of Property Rights*; China Architecture and Building Press: Beijing, China, 2008; pp. 28–36.
60. Song, W.F.; Han, X.F. The Rural Income Gaps Among Ecological Protection Boundary, Social Capital and Poor Counties. *Financ. Econ.* **2020**, *3*, 107–119.
61. Li, Y.; Gong, P.C.; Ke, J.S. Development opportunities, forest use transition, and farmers' income differentiation: The impacts of Giant panda reserves in China. *Ecol. Econ.* **2021**, *180*, 106869. [CrossRef]
62. Zhang, Y.; Xu, Q.; Wu, J.J. A Successful Anti-poverty War: Experience from China. *Econ. Res. J.* **2012**, *47*, 76–87.
63. Liu, W.; Zhang, Y.L. Study on off-farm employment and income gap of farmers: Based on heterogeneity analysis of local off-farm employment and out-of-village employment. *J. Huazhong Agric. Univ. (Soc. Sci.)* **2018**, *135*, 56–64+155. [CrossRef]
64. Burnett, P. Land use regulations and regional economic development. *Land Econ.* **2016**, *92*, 237–255. [CrossRef]
65. Cao, R.; Zhang, A.L.; Wen, L.J. Trans-regional compensation mechanism under imbalanced land development: From the local government economic welfare perspective. *Habitat Int.* **2018**, *77*, 56–63. [CrossRef]