Study on the effect of rural population aging on Farmers’ participation in collective management, protection of small-scale irrigation and water conservancy facilities: Taking Sichuan Province as an example

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Abstract. In recent years, a large number of infrastructure construction including small-scale farmland and water conservancy facilities have been carried out in rural areas of China. However, with the acceleration of urbanization process, a large number of young and middle-aged labor force has been transferred from rural areas to urban areas. Rural areas in China are facing serious aging problems, and the supply lack of labor force is insufficient, resulting in the collective management and protection of small-scale agricultural water conservancy facilities in a dilemma. Based on the survey data of 918 rural households in Jintang County, Meishan City and Chongzhou City, Sichuan Province, this paper uses ordered probit model to analyze the impact of rural population aging on rural households’ participation in collective management and protection of small-scale farmland water conservancy facilities. The results show that the aging degree of rural population is high, and it has a significant negative impact on the participation of farmers in the collective management and protection of farmland and water conservancy facilities. The increase of the cultivated land area of farmers has a alleviating negative effect of rural population aging.

1. Introduction
Since the beginning of the 21st century, China has continuously increased its input in rural infrastructure construction. In particular, in 2010 and 2011, the No.1 Document of the CPC Central Committee made the construction of irrigation and water conservancy facilities an important task and carried out the construction of rural infrastructure, including small irrigation and water conservancy facilities, effectively promoting the development of rural industry. However, with the construction and use of a large number of small rural infrastructure in the past decade, in reality, there have been insufficient supply problems such as “heavy construction, light management and protection, easy construction and difficult management and protection”, which have seriously hindered its efficient and sustainable use and caused a large waste of resources. The management and protection of agricultural small water conservancy facilities is to manage and maintain them so as to achieve the effect of low cost, high efficiency and sustainable utilization. However, agricultural small water conservancy facilities have the property of public goods (Ostrom, 1990; Willows and Zhu, 2018), and the characteristic of the dispersed, small scale, which will determine the need more human capital and more efficient and sustainable supply of the management, under the current household contract responsibility system, farmers and limited arable land and capital, apparently unable to undertake small agricultural water conservancy facilities management supply independently (CAI from China,
etc., 2015). Under this background, peasant households must take part in the management and protection of small agricultural water conservancy facilities in the form of collective action. How to improve peasant households’ participation enthusiasm becomes the key to solve the above problems, and also the key to explore the rural collective action. However, with the increasing degree of aging in rural areas and the lacking supply of rural labor (Lin Bao, 2015), public affairs governance is getting into trouble (Xu Yong, 2000, Jia Rui, et al., 2019). According to statistics from the Ministry of Civil Affairs, by the end of 2006, there were 149.01 million people aged 60 or above, accounting for 11.30 percent of the total population. By the end of 2018, the number had reached 249.49 million, accounting for 17.9 percent of the total population. Compared with cities, the aging problem of rural labor population is more serious in China (Feng Xin, 2019), and the aging trend is increasing year by year (He Xiaoqin, 2013; Limbaugh 2015).

With the deepening of rural aging in China, scholars have conducted a large number of studies on its impact with different methods. Li et al. (2018) use Logistic model to empirically analyze the relationship between labor aging and farmers’ adoption of new crop varieties. Qiao (2017) empirically analyzes the impact of aging of agricultural labor force on land use efficiency in labour-intensive agricultural production. Other scholars use systematic GMM estimation method to explore the relationship between aging and rural residents’ consumption (Xu, 2016; Hu, 2019). Moreover, studies have shown that the aging of rural labor population also have a profound impact on rural labor supply, economic development (Lin, 2015), comprehensive or pure technical efficiency (Tuersun et al., 2015), and rural land leasing market (Wang and Guo, 2013).

In terms of participation in collective management and protection of small irrigation and water conservancy facilities, there are few studies related to aging, but in recent years, scholars have discussed the influence of heterogeneity, labor force outflow, organizational support and social trust on peasant households’ participation in collective management and protection of small irrigation and water conservancy facilities. Zhao Yan (2018) studied the influence of organizational support and social trust on farmers’ willingness to participate in smallholder water supply by using HLM hierarchical model. Song Jing (2018) and Huang Lu (2017) both used Tobit model to empirically analyze the influencing factors of farmers’ participation in village collective action, and respectively pointed out that the mode of management and care, relationship network and agricultural income in economic heterogeneity had significant positive influence on farmers’ participation in village collective action. Wang Bo (2018) found that the proportion of migrant labor force in the household population had a significant negative impact on peasant households' participation in the collective management and protection of small-scale irrigation and water conservancy facilities, and suggested that a new type of collective action subjects be cultivated in rural areas.

After reviewing relevant literature, it is found that although the research on collective management and conservation of small agricultural water conservancy facilities in rural China has achieved fruitful results at present. They all take northern rural areas as the research objects, and few scholars have discussed rural areas in hilly areas in southwest China. In addition, the shortage of young rural labor force and the aging of the existing labor population have become a reality, and there are numerous studies on the impact of the aging of the rural population. However, the impact of the aging of the rural population on the participation of farmers in the collective management and protection of small agricultural irrigation and water conservancy facilities has not attracted sufficient attention of scholars. Based on this, this paper, based on the survey data of 918 households in Meishan, Jintang and Chongzhou of Sichuan Province, uses the Ordered Probit (Oprobit) model to discuss the impact of the aging of rural population on the participation of farmers in the collective management and protection of small agricultural water conservancy facilities.

2. Theories and hypothesis
Studies have shown that the aging of rural labor population have a profound impact on rural economic development (Lin, 2015). Rong (2019) using stratified sampling method, employing the general data questionnaire, Barthel index rating scale, and active aging scale (active ageing scale, AAS) in Henan
province, finds that the rural elderly citizens to actively participate in related affairs in good condition overall level is below average, in other words, the rural elderly people to participate in public affairs’ enthusiasm is not high. Agricultural labor force the knowledge, skills, health and physical strength is the main content of the human capital, and the change of the health and physical strength is from weak to strong, and then from strong to weak (Yao et al., 2015), the process of the visible than young adults, the elderly as weak in terms of labor supply, make it in participation in collective action ability obvious disadvantage. Based on this, this paper proposes the following hypothesis:

H1: The aging of rural population has a negative impact on peasant households’ participation in collective management and protection of small irrigation and water conservancy facilities.

It is an inevitable trend for the sustainable development of rural infrastructure to transform from reconstruction with light management to construction and maintenance (Wu Qinhua, 2015). The key to effectively solve the problem of management and protection lies in the participation of water users, that is, farmers' participation in small-scale water management and protection (Ostrom E, 1990; Lam W F, 2010). However small peasant household water attribute of public products and the production and operation of private product attributes conflict, weakened the enthusiasm of farmers to participate in the management (willow, etc., 2018), farmers strengthen individual economic rationality and village organizations at the grass-roots level of public affairs management function weaken led to a small water management difficulties, the conflict between individual economic rationality and collective rationality also determines the farmers in the small farmers voluntary cooperation on water management (spiral of Dewey, 2015). In other words, if public affairs are conducive to the development of individual economy, the enthusiasm of peasant households to participate in collective action will be significantly increased. China’s vast rural population serious aging does not constitute the social problems affecting economic and social development and social stability of the reason is that the central and western rural left-behind elderly from agricultural farming, form "to the pension" pattern (Xia Zhuzhi, 2018) and "on the basis of the division of intergenerational half work half till" mode of living, the young Labour out engaged in commerce and industry, elderly laborers at farming (Xia Zhuzhi, xue-feng he, 2017). This part of farmers is more dependent on land and more dependent on irrigation and drainage of irrigation and waterlogging of irrigation and water conservancy facilities. Therefore, they are more willing to participate in collective management and protection of small irrigation and water conservancy facilities. So despite the transfer of labor deepening rural aging population in young adults, are confronted with difficulty of collective action and public affairs, but different age level of farmers to participate in agricultural labor experience is different, the effect of irrigation and water conservancy facilities such as public goods supply have obvious different feelings and evaluation, it also affects the farmers to participate in collective action. Based on this, this paper proposes the following hypothesis:

H2: The expansion of farmers’ farming area can alleviate the adverse impact of the aging of rural population on farmers’ participation in the collective management of small irrigation and water conservancy facilities.

3. Data Statistics

3.1 Descriptive statistics of data sources and samples
The research data of this paper are mainly from the field survey of Jintang County, Chongzhou City and Meishan City, Sichuan Province in August 2018. The surveyed areas are located at the intersection of the hills and plains in southwest China, with a good ecological environment, distinct dry season and rainy season, and relatively developed agriculture. With the continuous acceleration of urbanization, many young and middle-aged labor force are not satisfied with the income brought by agriculture and choose to go out to work or start their own businesses, which leads to the gradual deepening of the aging of rural labor population in this region. In this survey, 1 to 3 villages were randomly selected from each township of the county and city, and 5 to 15 farmers were randomly selected from each village for interviews. The questionnaire covers basic characteristics of
interviewees, family characteristics, social network, management and protection of irrigation and water conservancy facilities in villages, and participation of farmers in management and protection. A total of 918 valid questionnaires were obtained.

Among the 918 respondents, 543 were males, accounting for 59.1%, and 375 were females, accounting for 40.9%. Among the respondents, 320 were aged over 60, accounting for 34.9%. There were 242 respondents aged 50-60, accounting for 26.4%, and 356 respondents under 50, accounting for 38.7%. Among them, 275, 29.9% respondents, had received secondary school education or above. According to the statistical results, the sample farmers generally become older and less educated.

| Table 1. Sample Base |
|----------------------|
| variable | Sample size | Proportion |
| gender | | |
| male | 543 | 59.29% |
| female | 375 | 40.71% |
| age | | |
| The < 50 years old | 356 | 38.7% |
| 50 to 60 years old | 242 | 26.4% |
| 60 years old or more | 320 | 34.9% |
| The proportion of people over 60 in the family | | |
| 50% or higher | 191 | 20.81% |
| 33.3% - 50% | 193 | 21.02% |
| 17.9% - 33.3% | 181 | 19.72% |
| < 17.9% | 353 | 38.45% |
| Education level | | |
| Primary schools and below | 643 | 70.04% |
| Junior high school | 168 | 18.30% |
| High school | 76 | 8.28% |
| Colleges | 31 | 3.34% |
| The area under cultivation | | |
| Less than 3 acres | 631 | 68.74% |
| 3-5 acres | 178 | 19.39% |
| 5-10 acres | 89 | 9.69% |
| More than 10 acres | 21 | 2.29% |
| Household income | | |
| < 10,000 yuan | 55 | 5.99% |
| 10,000-30,000 yuan | 365 | 39.76% |
| 30,000-50,000 yuan | 258 | 28.10% |
| 50,000-70,000 yuan | 148 | 16.12% |
| 70,000-100,000 yuan | 43 | 4.68% |
| >100,000 yuan | 49 | 5.34% |

3.2 Variable setting

3.2.1. The dependent variable. In order to analyze the behaviour of farmers participating in the collective management and protection of small agricultural water conservancy facilities, this paper takes the willingness of farmers participating in the collective management and protection of various water conservancy facilities as the evaluation index. 1: Not at all; 2: More reluctant; 3: It doesn’t matter; 4: Quite willing; 5: I’d love to. Variable, “I am willing to participate in small irrigation and water conservancy facilities management of collective action, small irrigation and water conservancy facilities management of collective action is my own business, I am willing to participate in
discussions of small irrigation and water conservancy facilities of collective action of the management meeting, I would like to make donations of small irrigation and water conservancy facilities of the collective action of the management. I will inform and invite others to small irrigation and water conservancy facilities management of collective action” five for farmers to participate in the management of willingness. Farmers for each small irrigation and water conservancy facilities efforts scoring said output will, scores for each small irrigation and water conservancy facilities and paid said willingness to pay. According to the overall statistical results, it is not difficult to find that in terms of the overall sample farmers, the average value of all the other items is greater than 3 except “I am willing to pay for the collective action of flood drainage and flood control facilities”, indicating that the overall willingness of farmers to participate in collective action is relatively optimistic. Compared with money, sample farmers are more willing to participate in the collective management and protection of small irrigation and water conservancy facilities in the form of contribution.

Table 2. Statistics of farmers’ willingness to participate in the collective management of small agricultural water conservancy facilities

| The variable name | The assignment | The mean | The standard deviation |
|-------------------|----------------|---------|------------------------|
| I would like to participate in the management of small irrigation and water conservancy collective action | money | 3.39 | 1.28 |
| The management of small irrigation and water projects and collective action is my business | The output | 3.41 | 1.24 |
| I would like to attend a meeting to discuss collective action for the management of small irrigation and water facilities | money | 3.52 | 1.2 |
| I would like to donate money and materials for the collective action of small irrigation and water conservancy | money | 3.62 | 1.07 |
| I will inform and invite others to participate in small irrigation and water conservancy management collective action | money | 3.5 | 1.21 |
| I am willing to protect collective action for water storage facilities | money | 3.16 | 1.24 |
| I am willing to protect the collective action for the diversion facility | money | 3.5 | 1.22 |
| I'm willing to take collective action for the water facility | money | 3.1 | 1.64 |
| I am willing to protect collective action for water conveyance and distribution facilities | money | 3.4 | 1.32 |
| I am willing to protect the collective action for field irrigation facilities | money | 3.05 | 1.35 |
| I am willing to take charge of the collective action for the drainage and flood control facilities | money | 3.48 | 1.23 |

3.2.2. The independent variable. Degree of household aging. In this paper, according to the internationally recognized standard of dividing the aging population at the age of 60, the sample farmers whose age is older than or equal to 60 years are defined as the aging population. Statistics show that 918 sample farmers have 320 middle-aged and elderly people, accounting for 34.9%. In addition, referring to the research of Yang and Chen (2016) and Yang (2018), this paper adopts the proportion of elderly population among family members as an indicator to measure the degree of aging. According to the statistical results, 191 households in the sample have an aging population of more than 50%, among which 61.55% have an aging population that exceeds the national level of 17.9% released by the Ministry of Civil Affairs in 2018, indicating that the aging of rural households is quite serious.

3.2.3. Control variables. Refer to existing research results (Wan, 2015; Nikku, 2002), this paper investigated the influencing factors of peasant households' participation in collective management and
protection of small irrigation and water conservancy facilities from the aspects of peasant households' characteristics and family characteristics. The individual characteristics of farmers include gender, age and years of education. Gender is assigned one for male and zero for female. The family characteristics include the number of families, the number of migrant workers, the annual income of the family, the cultivated land area of the family, whether there is a house in the hometown, the distance between the house and water conservancy facilities, whether there are relatives as village cadres, neighbourhood relationship and kinship. The cultivated land area is the farmer's own land area minus the transferred land area plus the transferred land area. Among the 918 households in the survey area, only 20 households exceeded 10 mu, 89 households covered 5-10 acres, 178 households covered 3-5 acres, and 631 households covered less than 3 acres, accounting for 68.74% of the total number of samples. The annual household income is assigned according to the income range: 0, 10,000 to 30,000; 13,000 to 50,000; 25,000 to 70,000; 37,000 to 100,000; 41,000 and above. 5. Whether the family is assigned by housing: Yes indicates 1, otherwise 0. Whether to serve as a village cadre assignment: yes for 1, no for 0. Neighbourhood and kindred: 5 very good, quite harmonious; 4 Good, ok; 3 In general, there is no good or bad; 2 poor, not good relationship; 1 Very bad, hostile state.

Table 3. Variable definitions and descriptive statistics

| The variable name                                                                 | Variable meaning                                                                                   | The mean | The standard deviation |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------|------------------------|
| Farmers' willingness to participate in the management and protection of small irrigation and water conservancy facilities | The average score of willingness of each farmer to participate in each project is shown in the above section | 3.3      | 0.93                   |
| Household characteristics                                                         |                                                                                                  |          |                        |
| gender                                                                           | 1: male; 0: female                                                                                | 0.59     | 0                      |
| age                                                                              | Actual age of sample Farmers in 2018 (year)                                                       | 52.36    | 15.11                  |
| Is he old or not                                                                 | Whether the sample farmers are over 60 years old in 2018, 1: Yes; otherwise, 0. | 0.35     | 0.48                   |
| Years of education                                                               | Years of education of sample farmers (year)                                                      | 5        | 3.3                    |
| Family characteristics                                                           |                                                                                                  |          |                        |
| The number of households                                                         | Actual number of households in the sample in 2018 (person)                                        | 4.75     | 1.91                   |
| Degree of aging                                                                  | In 2018, the proportion of the elderly over 60 years old in the sample households                  | 0.35     | 1.33                   |
| Annual household income                                                           | The annual income range of sample households in 2017, the value of which is described above       | 1.9      | 1.21                   |
| Building area                                                                     | Actual area of village houses (M)²                                                                | 145.20   | 97.32                  |
| Distance from residence to smallholder water                                      | Distance between the sample peasant household's housing and small Irrigation and water Conservancy Facilities (KM) | 0.63     | 0.91                   |
| The area under cultivation                                                        | Area of cultivated land planted by sample Households in 2018 (mu)                               | 2.12     | 3.66                   |
| Whether has the relative to hold the post of village cadre                         | 1: it is; 0: no                                                                                  | 0.11     | 0.32                   |
| neighborhood                                                                      | The relationship between the sample household and the village neighbor, the value is described above | 4.37     | 0.75                   |
| relation                                                                          | The value of the relationship between families and relatives of sample farmers is described above | 4.43     | 0.67                   |

4. Model construction and empirical results

4.1. Model Construction
In this paper, the willingness of farmers to participate in small-scale irrigation and water conservancy facilities is assigned as: 1: completely unwilling; 2: More reluctant; 3: It doesn't matter; 4: Quite willing; 5: I'd love to. This is an obvious Ordered multiple classification variable, so this paper adopts Ordered Probit model. Its regression equation is:

$$Y^* = \alpha X + \beta N + \epsilon$$

In the above equation (1), $Y^*$ is an unobservable latent variable, $X$ is the independent variable, $N$ is all the control variables listed in Table 3, and are the coefficients to be estimated, and is a random disturbance term that follows a normal distribution. The following relationship exists between the willingness $Y$ of observable farmers to participate in small-scale irrigation and water conservancy facilities and the unobservable latent variable $Y^*$.

$$Y =
\begin{cases}
1 & \text{ (not at all), if } Y^* \leq f_1 \\
2 & \text{ (less willing), if } f_1 > Y^* \leq f_2 \\
3 & \text{ (it doesn't matter), if } f_2 > Y^* \leq f_3 \\
4 & \text{ (prefer), if } f_3 > Y^* \leq f_4 \\
5 & \text{ (very willing), if } f_4 > Y^*
\end{cases}
$$

In equation (2) above, $f_1$, $f_2$, $f_3$, $f_4$, $f_5$ respectively represent farmers’ willingness to participate in small-scale irrigation and water conservancy facilities, and $f_1 < f_2 < f_3 < f_4 < f_5$. Thus, the orderly probability distribution of farmers participating in small irrigation and water conservancy facilities is obtained.

$$P(Y=1/N) = \Phi (r_1 - \alpha X - \beta N)$$
$$P(Y=2/N) = \Phi (r_2 - \alpha X - \beta N) - \Phi (r_1 - \alpha X - \beta N)$$
$$P(Y=3/N) = \Phi (r_3 - \alpha X - \beta N) - \Phi (r_2 - \alpha X - \beta N)$$
$$P(Y=4/N) = \Phi (r_4 - \alpha X - \beta N) - \Phi (r_3 - \alpha X - \beta N)$$
$$P(Y=5/N) = \Phi (r_5 - \alpha X - \beta N) - \Phi (r_4 - \alpha X - \beta N)$$

Type (3) - (7) on the $\Phi$ for cumulative density function of standard normal distribution.

### 4.2. Empirical Analysis

In this paper, Stata16 software was used to analyze the impact of the aging of the household population on the willingness of farmers to participate in the collective management and protection of small-scale irrigation and water conservancy facilities. The proportion of the elderly in the sample households was taken as an independent variable, and the estimated results were expressed by equation 1. Equation 2 analyzes the interaction term between the cultivated land area planted by farmers and the proportion of the elderly in the sample family.

**Table 4.** Model estimation of the impact of aging on farmers’ participation in collective management of irrigation and water conservancy facilities

| The variable name | Equation 1 | Equation 2 |
|-------------------|------------|------------|
|                   | coefficient | Standard error | coefficient | Standard error |
| The proportion of the elderly in the family | -0.529* | 0.312 | -0.400 | 0.323 |
| In the cultivated land area × the proportion of old people in the family | —— | —— | -0.082 | 0.055 |
| Age of interviewee | 0.002 | 0.003 | 0.002 | 0.003 |
| Gender | 0.119 | 0.074 | 0.119 | 0.074 |
| Years of education | 0.071*** | 0.128 | 0.070*** | 0.013 |
| The number of households | -0.042 | 0.030 | -0.042 | 0.030 |
Table (4) in the equation, according to the results of population ageing rural households of farmers participate in small irrigation and water conservancy facilities in the collective will of the management in 10% of the statistical level significantly, and the estimated coefficient is negative, this also verify the above hypothesis: H1: rural farmer participation in collective small irrigation and water conservancy facilities of the aging of population has the adverse effect of the management. In addition, the cultivated land area of peasant households is statistically significant at the 1% level, and the coefficient is positive, in line with the above analysis. The larger the cultivated land area of peasant households is planted, the more dependent they are on small irrigation and water conservancy facilities, and the greater their enthusiasm to participate in management and protection.

In equation 2, although the interaction term between the cultivated land area and the proportion of the elderly in the family still has a negative influence, it is no longer significant, indicating that the increase of the cultivated land area planted by households can effectively alleviate the negative influence of aging on the willingness of farmers to participate in irrigation and water conservancy facilities. Thus, hypothesis H2 is verified: the farming area of peasant households can alleviate the adverse impact of aging of rural population on peasant households' participation in collective management and protection of small irrigation and water conservancy facilities.

In equation 1, the years of education have a statistically significant effect on the willingness of farmers to participate in 1%, and the coefficient is positive, indicating that the education level of farmers can effectively promote their participation in the collective management and protection of irrigation and water conservancy facilities. Relatives have a significant positive impact on farmers' willingness to contribute, indicating that the closer their relatives are, the more active their willingness to participate in collective action will be. Relatives as village cadres or a civil servant in the 5% level significantly, and the coefficient is positive, that someone in the family relatives as a civil servant or village cadres, their participation in collective management will significantly enhance agricultural water conservancy facilities, civil servants and village cadres in rural areas relatively high social status and social impact is bigger, to the people around with strong leading role.

### 4.3. Robust test
In order to test the robustness of the above estimated results, this paper referring to the test method of Yang (2018), selected the elderly farmers and young farmers in the sample separately, and again estimated the impact of aging on farmers’ participation in collective management and protection of small-scale agricultural water conservancy facilities. All the family members of elderly farmers are 60 years old or above, and all the family members of young farmers are under 60 years old. Finally, 42 elderly households and 296 young households were obtained. As shown in Table 5, the estimated
results are consistent with those in Table 4. In this way, the above research on the impact of the aging of rural population on the collective management of small agricultural water conservancy facilities is significant.

Table 5. Robustness test results

| variable name                                      | Equation 1             | Equation 2             |
|---------------------------------------------------|------------------------|------------------------|
|                                                   | coefficient | Standard error | coefficient | Standard error |
| The proportion of the elderly in the family       | -0.949**               | 0.406                 | -1.11**      | 0.436          |
| In the cultivated land area × the proportion of old people in the family | ———                  | ———                  | 0.113        | 0.115          |
| Age of interviewee gender                         | ———                  | ———                  | ———         | ———            |
| The area under cultivation                         | 0.146***               | 0.033                 | 0.138***     | 0.033          |
| Other control variables                           | Have control           | Have control           |
| Log likelihood                                    | -433.163               | -432.68               |
| LR chi2                                           | 114.48                 | 115.45                |
| Pseudo R 2                                        | 0.117                  | 0.118                 |

5. Conclusions and policy recommendations

This paper uses the survey data of 918 households in Jintang, Meishan and Chongzhou, Sichuan province, and uses the ordered Probit model to empirically analyze the impact of rural population aging on peasant households’ participation in collective management and protection of small irrigation and water conservancy facilities. Mainly have the following conclusion: the farmer participation in irrigation and water conservancy facilities of the aging of the rural population collective management has a negative impact, and farmers farming area of farmers to participate in collective small irrigation and water conservancy facilities management has a positive influence, and can help farmers to participate in the rural population aging of the adverse impact of the collective management of small irrigation and water conservancy facilities.

Based on the research conclusions of this paper, the following suggestions are proposed. First, small irrigation and water conservancy facilities play an important role in agricultural development, and adequate attention should be paid to their daily management and maintenance. Relevant departments should improve relevant systems to promote the integrated development of rural infrastructure including construction, management and use. Second, the aging of China’s rural population has become a serious problem, which also needs to be attached great importance to. We should continue to adhere to the rural revitalization strategy, attract young and middle-aged labor force to return to their hometown and start businesses, and promote the prosperity of rural talents and industries. Third, we should continue to reform the rural land system, promote the orderly transfer of rural land, step out of the fragmentation of land and agricultural production, and promote intensive management of rural agriculture, land and infrastructure. Fourthly, the education level of peasant households has a significant positive impact on their participation in collective actions. Therefore, the investment in education in rural areas should be increased to further promote educational equity. Meanwhile, ideological education guidance and agricultural technical training should be promoted in rural areas to improve the overall quality of rural labor force.

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