ChinaRxiv

AI translation · View original & related papers at
chinarxiv.org/items/chinaxiv-201711.01858

The Impact of Smallholders' Socioeconomic Characteristics on Crop Planting Intention: A Post-print Study of Fuzhou Jasmine Growers for Agricultural Heritage Conservation

Authors: Yongxun Zhang, Min Qingwen, Wang Weiqi, He Lulu, Zheng Jiangmin

Date: 2017-11-07T00:00:00+00:00

Abstract

Due to urban land encroachment and increasing cultivation costs, the planting area of Fuzhou jasmine has declined sharply, seriously threatening the sustainability of the important agricultural heritage system—the Fuzhou Jasmine and Tea Culture System. The foundation for ensuring the sustainability of jasmine cultivation lies fundamentally in flower growers' planting willingness and its influencing factors, which should inform the formulation of targeted protection measures. This study collected data on flower growers' socioeconomic characteristics and their jasmine cultivation willingness through questionnaire surveys and farmer interviews. Descriptive statistical methods were employed to analyze the socioeconomic characteristics of the surveyed farmers, while binary Logistic regression analysis was used to examine the relationship between flower growers' basic social characteristics (gender, age, education level, information acquisition methods, depth of understanding of jasmine uses) and economic characteristics (current per-unit-area income from jasmine, growers' income status among acquaintances, and growers' desired per-unit-area income from jasmine) and their planting willingness, thereby identifying the main factors influencing farmers' planting intentions. The results show that the flower grower population is trending toward aging, with generally low education levels and relatively backward and singular information acquisition methods; the overall comprehensive cognitive level regarding jasmine is not high, yet more than half of the flower growers intend to continue jasmine cultivation; flower growers' information mastery ability and their expectations for per-unit-area jasmine income are the two main factors influencing their willingness to continue cultivation. The primary pathways to ensure sustainable development of the jasmine cultivation industry include: increasing jasmine cultivation subsidies, attracting young talent to the

jasmine industry through policy incentives, and establishing sustainable mechanisms for the cultivation sector; promoting cooperation between enterprises and farmers as well as among farmers themselves to stabilize cultivation income; fully utilizing the multifunctionality of jasmine cultivation to develop diverse industrial models such as tourism and leisure agriculture; drawing upon principles of traditional planting techniques to develop efficient production equipment and improve jasmine cultivation efficiency, thereby reducing labor intensity and increasing farmer income; strengthening the dissemination of knowledge on agricultural heritage conservation and utilization and training in traditional planting techniques for flower growers to enhance their self-development capacity; and establishing agricultural heritage culture courses and heritage site education practice courses for primary and secondary school students to foster their emotional attachment and conservation awareness toward the Jasmine and Tea Culture System.

Full Text

Impact of Household Socioeconomic Characteristics on Crop Planting Willingness: A Case Study of Jasmine Growers in Fuzhou for Agricultural Heritage Conservation

ZHANG Yongxun[1],[2], MIN Qingwen[1],[2], WANG Weiqi[3], HE Lulu , ZHENG Jiangmin **

[1]Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing 100101, China
[2]University of Chinese Academy of Sciences, Beijing 100049, China
[3]School of Geographical Sciences, Fujian Normal University, Fuzhou 350007, China
School of Economics and Management, Beijing University of Agriculture, Beijing 102206, China
Agriculture Bureau of Fuzhou City, Fuzhou 350005, China

Abstract
Rapid urbanization and increasing farming costs have caused a sharp decline in jasmine planting area in Fuzhou, severely threatening the sustainability of the Fuzhou Jasmine and Tea Cultural System—an Important Agricultural Heritage System. The fundamental guarantee for sustainable jasmine cultivation lies in understanding growers' planting willingness and its influencing factors, which is critical for developing targeted conservation measures. This study collected data on jasmine growers' socioeconomic characteristics and planting willingness through questionnaire surveys and household interviews. Descriptive statistics were used to analyze growers' socioeconomic profiles, while binary logistic regression examined relationships between their social characteristics (gender, age, education, information access methods, and cognitive depth of jasmine uses) and economic characteristics (current per-unit-area income, income relative to peers, and expected per-unit-area income) with their planting willingness, aim-

ing to identify key influencing factors. Results show that jasmine growers are trending toward an aging population with generally low education levels and backward, singular information access methods. Their overall comprehensive cognitive level of jasmine is not high, though slightly more than half plan to continue cultivation. Information acquisition capacity and expected per-unit-area income are the two main factors influencing growers' continuation decisions. Key pathways for ensuring sustainable jasmine cultivation include: increasing planting subsidies and attracting young talent through policy incentives to establish sustainable mechanisms; promoting cooperation between enterprises and households to stabilize cultivation income; leveraging the multifunctionality of jasmine cultivation to develop tourism and leisure agriculture; developing efficient production equipment based on traditional techniques to reduce labor intensity and increase income; strengthening training on agricultural heritage conservation knowledge and traditional cultivation techniques to enhance self-development capacity; and implementing agricultural heritage education programs in primary and secondary schools to foster emotional attachment and conservation awareness among youth.

Keywords: Farmer household; Planting willingness; Globally Important Agricultural Heritage Systems (GIAHS); China Nationally Important Agricultural Heritage Systems (China-NIAHS); Fuzhou Jasmine and Tea Culture System

Introduction

Improvements in agricultural production efficiency and widening urban-rural development gaps have driven large numbers of rural laborers to migrate to cities, accelerating the disappearance of traditional agricultural practices and cultures. However, as modern agricultural methods increasingly raise concerns about food security, ecological security, and environmental problems, traditional agriculture' s sustainability advantages have gained renewed attention and validation. Since the Food and Agriculture Organization (FAO) launched the Globally Important Agricultural Heritage Systems (GIAHS) initiative, agricultural heritage conservation has received growing attention, attracting numerous scholars and yielding significant progress in various fields. Theoretical research has explored conservation mechanisms and macro-level policies, while practical measures such as multi-stakeholder participation mechanisms, cultural protection and inheritance systems, ecological and price compensation mechanisms, and ecological industry development have been proposed to encourage public participation in agricultural heritage conservation. Nevertheless, research examining conservation challenges and influencing factors from the perspective of farmers' planting willingness remains relatively scarce. Effective conservation outcomes, whether at national or individual heritage site levels, must begin with farmers—the direct maintainers of traditional agricultural systems and carriers of production experience and cultural heritage. Analyzing their willingness to continue agricultural activities and thoroughly examining the problems and root causes of

heritage conservation is crucial for proposing and formulating effective policies and measures.

Jasmine (*Jasminum sambac*), with its pungent, sweet, and cooling properties, has calming and depression-relieving effects. As early as the Song Dynasty, Fuzhou developed new tea processing techniques combining fresh jasmine flowers with green tea. After more than 1,000 years of development, jasmine tea has gained international renown. However, since the early 1990s, urban land expansion and low comparative benefits from jasmine cultivation have caused a drastic reduction in planting area, severely threatening the jasmine tea industry' s development. Since 2012, government policies including planting subsidies and fertilizer subsidies have encouraged farmers to cultivate jasmine, while actively promoting applications for China Nationally Important Agricultural Heritage Systems (China-NIAHS) and GIAHS designation to advance industrial development and cultural conservation. Yet key questions remain unclear: What are the characteristics of current jasmine growers? Are they willing to continue planting? What are the main influencing factors? These aspects directly determine heritage conservation measure formulation. Using Fuzhou jasmine cultivation as a case study, this paper reveals characteristics of heritage conservation stakeholders and main factors influencing planting willingness through household surveys, proposing policy recommendations for conserving jasmine cultivation. We hope this will promote conservation of the Fuzhou Jasmine and Tea Cultural System and provide useful references for in-depth agricultural heritage conservation research.

1. Study Area Overview

Fuzhou City is located in east-central Fujian Province along the lower Min River, between 118°08 -120°31 E and 25°15 -26°29 N. The terrain slopes from northwest to southeast, with mountains and hills covering 72.68% of the total land area. The climate is subtropical maritime monsoon, characterized by warmth, humidity, abundant rainfall, and evergreen seasons. The annual average temperature is 19.6°C, with monthly averages of 7°C in January and 28.6°C in July. Annual precipitation averages 1,342.5 mm, with 326 frost-free days and 1,700–1,980 hours of sunshine annually. Relative humidity averages 77%. Zonal soils are predominantly acidic red soil, lateritic red soil, and yellow soil, while cultivated land consists mainly of paddy soil with significant vertical distribution patterns. Alluvial plains feature slightly acidic or neutral sandy loam with loose texture, deep layers, high fertility, and good aeration and drainage—highly suitable for jasmine growth. Jasmine is scattered across 31 towns in six counties (districts) of Fuzhou' s current jurisdiction: Jin' an District, Cangshan District, Minhou County, Changle City, Lianjiang County, and Yongtai County, with a total planting area of approximately 2,066.67 hectares. Jin' an District, Cangshan District, Changle City, and Minhou County were historically the main jasmine-producing areas and remain the primary distribution zones for traditional cultivation methods.

2. Methods

2.1 Data Sources

Based on the current status of jasmine cultivation and socioeconomic conditions in Fuzhou, we designed a personal questionnaire covering nine aspects of growers' socioeconomic characteristics and planting willingness: social characteristics (gender, age, education, information access methods, and cognitive depth of jasmine uses) and economic characteristics (current per-hectare income, income relative to peers, and expected per-hectare income) . Following agricultural heritage conservation requirements to protect traditional agricultural systems and knowledge, we conducted random sampling surveys among jasmine growers working in fields during mid-to-late July 2013. Survey sites included traditional planting areas in Gushan and Shoushan towns (Jin' an District), Chengmen and Gaishan towns (Cangshan District), Heshang and Guhuai towns (Changle City), and Shanggan and Xiangqian towns (Minhou County). We distributed 12–17 questionnaires per town, totaling 113 questionnaires (Fuzhou Agriculture Bureau statistics indicate approximately 1,500 individual jasmine households). We recovered 102 valid questionnaires, yielding an 89.5% effective response rate.

2.2.1 Questionnaire Indicator Quantification

To objectively analyze how socioeconomic characteristics affect planting willingness, we used expert scoring to assign quantitative values to different indicators [18] (Table 1) and calculated factor scores. The specific method was:

$$S_j = \sum_i I_{ij} \quad (1)$$

where j refers to question numbers X1–X8 in Table 1; i refers to options following questions X1–X8; S_j represents the score value for questions X1–X8 (cumulative score for multiple-choice questions); and I_ij represents the score value for each option.

2.2.2 Data Analysis

We used Microsoft Excel 2007 for statistical analysis and graphing of socioeconomic characteristics and planting willingness data. Since the final outcome of whether farmers would continue jasmine cultivation is binary—willing (Y1=1) or unwilling (Y1=0)—we employed binary logistic regression analysis in SPSS 17.0 to analyze relationships between planting willingness (Y1) and all influencing factors: social characteristics (gender X1, age X2, education X3, information access X4, cognitive level X5) and economic characteristics (per-hectare income X6, relative income position X7, expected income X8). We used the backward conditional method for variable selection.

The logistic regression model is expressed as:

$$\ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \sum_{k=1}^{n} \beta_k X_k + \varepsilon$$

where P_i is the probability of farmers willing to continue planting; $\_k$ are regression coefficients for influencing factors; X_k are factors affecting continuation decisions; and is the constant term.

3. Results

3.1 Individual Characteristics of Jasmine Growers

Among randomly sampled respondents, 48.8% were male and 51.2% female, showing a relatively balanced gender ratio . Age structure revealed that most growers were middle-aged or elderly over 45 years old, with those over 55 accounting for 68.3%. The proportion of growers decreased with younger age groups. Education levels were generally low: 65.9% had primary school education, 17.1% junior middle school, 12.3% senior middle school, and only 4.9% college or above. Regarding information access, television was the most important channel, with 43.9% also using mobile phones, 19.5% using computers in addition to TV and mobile, and only 7.3% regularly reading newspapers. No respondents read professional journals. Overall, Fuzhou' s jasmine grower population suffers from severe aging, low education levels, backward and singular information access methods, and low technological content in cultivation practices—conditions highly unfavorable for inheriting, protecting, and developing traditional jasmine cultivation.

3.2 Growers' Cognitive Level of Jasmine Uses

Survey results on growers' cognitive levels regarding jasmine uses and medicinal functions [Figure 1: see original paper] showed that 100% of respondents recognized jasmine' s use in scenting tea, followed by air freshening (31.7%). Other recognized uses, in descending order, were: greening plants > indoor decoration = food processing > ceremonial flowers > perfume and soap production. This reflects that jasmine's primary use in Fuzhou is for tea scenting, with limited utilization in other areas. Regarding medicinal value [Figure 1b: see original paper], 63.4% recognized jasmine' s refreshing and calming effects, while awareness of its antiseptic, anti-inflammatory, intestinal clearing, and blood pressure/blood fat reducing functions was very low. Beyond the listed medicinal functions, respondents did not identify any "other" therapeutic effects.

3.3 Economic Characteristics of Jasmine Growers

As shown in [Figure 2: see original paper], growers' per-hectare jasmine income primarily concentrated in the 75,000–150,000 yuan range (32.4% of respondents), followed by 0–75,000 yuan. Above 150,000 yuan, the proportion generally decreased with increasing income, showing substantial income disparities. Most

growers' household economic levels were middle or lower-middle income relative to their peers (31.4% and 34.3% respectively), with smaller proportions of low-income and above-average-income households. Expected future per-hectare income concentrated in three ranges: 75,000–150,000 yuan (46.1%), 375,000–450,000 yuan (21.6%), and 225,000–300,000 yuan (15.7%). These data indicate that most jasmine growers have low to middle household incomes, with per-hectare income generally not exceeding 150,000 yuan but potentially reaching over 450,000 yuan, suggesting substantial room for income improvement. Jasmine growers' economic status aligns with the generally low income situation of Chinese farmers [19], highlighting the necessity and urgency of adjusting agricultural industrial structure, implementing farmer-friendly policies, and improving rural market circulation systems.

3.4 Future Planting Intentions

Survey results on whether growers plan to continue jasmine cultivation and their reasons showed that 53.7% intend to continue. Main reasons included "emotional attachment to jasmine," "passing time and physical exercise," "no other skills," "relatively high planting profits," "occupying land for demolition compensation," and "providing raw materials for own tea factories," with "relatively high profits" being most common, followed by "emotional attachment" and "passing time/physical exercise." The 46.3% who do not plan to continue cited "exhausting work" and "too low profits" as primary reasons, with most respondents citing both factors simultaneously. Beyond economic motives, the data reveal that leisure motivation has become another important reason for continued cultivation among elderly farmers as economic conditions improve and income sources diversify.

3.5 Analysis of Factors Influencing Planting Willingness

Using X1–X8 as independent variables and Y1 as the dependent variable, binary logistic regression analysis revealed factors influencing planting willingness. We employed stepwise analysis with collinearity diagnostics to exclude variables significantly affecting result stability and construct an optimal regression equation [20]. The Hosmer and Lemeshow test showed sig.=0.995>0.05, indicating no statistical significance and good model fit with 90.2% prediction accuracy and strong stability. The final regression model included information access methods (X4) and expected per-hectare income (X8) as variables .

Results show that growers' continuation decisions are dominated by information access methods and expected per-hectare income, with regression coefficients of 3.370 and 1.344 respectively, both highly significant (P=0.005<0.01, P=0.001<0.01). This indicates that growers with richer information access methods (higher scores) have stronger willingness to continue jasmine cultivation, and those with higher expected per-hectare income are more likely to continue planting.

4. Discussion

The severe aging of Fuzhou jasmine growers directly threatens the inheritance and conservation of the "Fuzhou Jasmine and Tea Cultural System." Jasmine growers fall into two categories: enterprises (large-scale base cultivation) and smallholders (typically 0.02–0.13 hectares, scattered in urban-rural fringe areas and suburbs). Due to Fuzhou' s developed coastal economy, opportunities for higher-income occupations are abundant [21]. Additionally, many jasmine cultivation processes cannot be mechanized and require manual labor, demanding high experience, causing exhausting work with low efficiency. Moreover, jasmine purchase prices fluctuate significantly, creating high economic risks. Under these "push-pull" forces [22], growers with other skills and younger generations abandon jasmine cultivation. Consequently, similar to overall rural aging trends in China [23], smallholder operations are predominantly managed by elderly farmers—an age structure highly unfavorable for inheriting and developing traditional jasmine cultivation. On the other hand, middle-aged growers operate at larger scales (2–13 hectares), employing experienced laborers, reflecting that individual contracted large-scale operations and corporate-scale cultivation are becoming the main management forms. However, even large-scale operations still rely on experienced elderly growers, indicating that jasmine cultivation cannot be separated from skilled farmers in the future. As a vital component of agricultural heritage, if jasmine cultivation cannot attract youth participation, the sustainable development of Fuzhou' s Jasmine and Tea Cultural System may face severe challenges.

A critical issue accompanying grower aging is the universally low education level due to historical reasons, resulting in backward information access methods [24]. Our analysis shows that information access methods are among the most important factors influencing continuation willingness—richer information access correlates with stronger planting intentions. This may be because: (1) information-savvy elderly growers often have successful children and relatively wealthy families with higher spiritual needs, using jasmine cultivation to enrich their later years while exercising and improving quality of life; and (2) information-savvy younger growers can proficiently use various information tools to timely grasp market changes and adjust operations, demonstrating stronger industrial development capacity [25] and recognizing promising prospects for jasmine cultivation. Furthermore, jasmine' s long-standing primary use for tea production in Fuzhou has led to narrow perceptions among growers, which is detrimental to industrial extension but conversely indicates substantial development potential. Therefore, from a heritage conservation perspective, introducing highly educated, culturally conscious young talent to leverage the GIAHS and China-NIAHS brands, rich cultural connotations, and broad development potential to innovate industrial models and improve comprehensive benefits represents an important conservation pathway.

Most growers express willingness to continue jasmine cultivation, with reasons focusing on emotional attachment and leisure/exercise benefits, while those un-

willing cite only exhausting work and low profits. This provides three key insights: (1) jasmine cultivation can serve as a leisure activity; (2) cultivating youth attachment to jasmine is a conservation strategy; and (3) improving technological content and increasing benefits are priority conservation issues.

Results also show that expected per-unit-area income significantly influences planting decisions—higher expected income correlates with stronger willingness. This indicates that economic income is the decisive factor for most growers, with income expectations directly determining continuation decisions. However, current income realities suggest most smallholders will struggle to achieve substantial per-unit-area increases, leading to generally low expectations. The wide income gap among growers (ranging from under 75,000 to over 450,000 yuan per hectare) stems not from yield issues but from poor marketing channels. Since suburban Fuzhou growers cultivate small areas with minimal harvests, they can only sell to middlemen ("flower heads") at 10–20 yuan/kg—only 1/5 to 1/3 of factory purchase prices—resulting in very low per-hectare income, low future income expectations, and reduced planting enthusiasm. Therefore, policy support and guidance to establish cooperative management models and stable marketing channels for smallholders constitute important conservation work.

5. Conclusions and Recommendations

Fuzhou' s jasmine grower population has an unreasonable age structure, with over 85% aged 45 or older, indicating severe aging that threatens traditional cultivation inheritance and development. This aging results in universally low education levels, backward and singular information access methods, low comprehensive cognitive levels of jasmine, and low technological content in cultivation, thereby affecting planting enthusiasm and hindering industrial extension. Per-unit-area income is low with huge disparities; small-scale growers generally have low household incomes and pessimistic income expectations, resulting in low planting enthusiasm.

Over half of growers are willing to continue jasmine cultivation, primarily because they expect "relatively high planting profits," though "emotional attachment" and "passing time/physical exercise" are also important reasons. Information acquisition capacity and per-unit-area income expectations are key influencing factors—growers with richer information access methods show stronger continuation willingness, and higher expected per-unit-area income increases continuation likelihood.

As a vital component of the "Fuzhou Jasmine and Tea Cultural System," jasmine cultivation protection is the responsibility of local government and people. Based on our findings, local governments should implement multifaceted conservation measures:

1. **Establish sustainable mechanisms**: Provide substantial economic subsidies to increase profit margins; support college graduate entrepreneurship and inject new vitality through policies encouraging graduate partic-

ipation in agriculture and village official programs. Innovate development models such as jasmine cultivation integrated with other industries to improve comprehensive benefits and expand income sources by diversifying jasmine uses, thereby attracting more participants and ensuring heritage sustainability.

2. **Promote cooperation and improve marketing**: Facilitate enterprise-household cooperation (e.g., "company + household" models) and household cooperatives to improve circulation channels, reduce transaction costs, and create win-win situations. Promote agricultural cooperatives to balance bargaining power and ensure stable farmer incomes, thereby stabilizing cultivation earnings and strengthening growers' confidence.
3. **Develop diversified industrial models**: Create leisure agriculture centered on jasmine cultivation to improve economic benefits and working conditions for those who enjoy or must continue planting. Draw on traditional cultivation principles to develop small-scale machinery to replace manual labor, enabling scaled cultivation, reducing labor costs, and improving industrial efficiency.
4. **Strengthen capacity building**: Conduct training programs on cultivation skills and information technology to improve growers' information access and diversified management capabilities, enhancing their business confidence and industry expectations.
5. **Cultivate youth engagement**: Implement agricultural heritage education and practice programs about the "Fuzhou Jasmine and Tea Cultural System" in primary and secondary schools to foster emotional attachment among youth and build a talent foundation for jasmine inheritance and development.

References

[1] Liu H Y. Existed problems in the architectural cultural resources protection in ancient villages and the countermeasures: Taking Hezhou Village as an example[J]. Reform & Openning, 2011(2): 130-131
[2] Li J, Huang J F, Cheng J A. Time and spatial distribution character of fertilizer consumption and potential pollution in China[J]. Ecology and Environment, 2003, 12(2): 145-149
[3] Soliman K M. Changes in concentration of pesticide residues in potatoes during washing and home preparation[J]. Food and Chemical Toxicology, 2001, 39(8): 887-891
[4] Hoai P M, Sebesvari Z, Minh T B, et al. Pesticide pollution in agricultural areas of northern Vietnam: Case study in Hoang Liet and Minh Dai communes[J]. Environmental Pollution, 2011, 159(12): 3344-3350
[5] Xie J, Hu L L, Tang J J, et al. Ecological mechanisms underlying the sustainability of the agricultural heritage rice-fish coculture system[J]. Proceedings of the National Academy of Sciences of the United States of America, 2011,

108(50): 19851-19852
[6] Zhao L J, Xu W S, Sun Y H, et al. On the conservation of China' s agro-cultural heritage systems[J]. Chinese Journal of Eco-Agriculture, 2012, 20(6): 688-692
[7] Li M, Wang S M. Agro-cultural heritage: What is protected and how to protect[J]. Agricultural History of China, 2012(2): 119-129
[8] Sun Y H, Min Q W, Cheng S K, et al. The community potential for tourism development in agricultural heritage sites: A case study of Qingtian County[J]. Geographical Research, 2011, 30(7): 1341-1350
[9] Zhang J G, He F, Xiao S H, et al. Tourism development for terraced fields in the regions south of the Yangtze River from the perspective of agricultural heritage preservation: Taking Meiyuan terraced fields of Zhejiang as case example[J]. Journal of Central South University of Forestry & Technology, 2011, 31(3): 47-53
[10] Qiu Z M, Chen B X, Takemoto K. Conservation of terraced paddy fields engaged with multiple stakeholders: The case of the Noto GIAHS site in Japan[J]. Paddy and Water Environment, 2014, 12(2): 275-283
[11] Zhang Y X, Min Q W. A review of conservation of rice terraces as agricultural heritage systems[J]. Chinese Journal of Eco-Agriculture, 2016, 24(4): 460-469
[12] Liu M C, Xiong Y, Yuan Z, et al. Standards of ecological compensation for traditional eco-agriculture: Taking rice-fish system in Hani terrace as an example[J]. Journal of Mountain Science, 2014, 11(4): 1049-1059
[13] Zhang Y X, Liu M C, Min Q W, et al. Calculation of price compensation of agriculture products in the period of organic conversion in agricultural heritage sites—Taking paddy rice of Hani terrace in Honghe County of Yunnan Province as an example[J]. Journal of Natural Resources, 2015, 30(3): 374-383
[14] Lin X B, Yan Y Y, Min Q W, et al. Anempirical analysis of Jasminum sambac famers' willing to accept eco-compensation value and related influencing factors in Fuzhou[J]. Science of Soil and Water Conservation, 2014, 12(2): 65-71
[15] Sun Y H, Jansen-Verbeke M, Min Q W, et al. Tourism potential of agricultural heritage systems[J]. Tourism Geographies, 2011, 13(1): 112-128
[16] Zhao H W. Jasmine utilization value and comprehensive utilization[J]. Modern Agricultural Science and Technology, 2008(22): 89
[17] Local Chronicles Compilation Committee of Fuzhou City, Fujian Province. Fuzhou City Record (Volume 1)[M]. Beijing: Local Press, 1998
[18] He L, Zhang Y X, Min Q W, et al. An investigation of community residents' perceptions on solar energy resources in the migration settlements in the "Three-River-Source" Area[J]. Resources Science, 2012, 34(11): 2026-2033
[19] Wang Y Z. Analysis of the influencing factors and trend of the income gap between urban and rural residents[D]. Changchun: Dongbei University of Finance and Economics, 2015
[20] Lin Z Y. Multivariate Analysis: The Operation and Application of SPSS[M]. Beijing: Peking University Press, 2007
[21] Zou X J, Wu D. Floating population impact on rural aging[J]. Population

Journal, 2013, 35(4): 70-79
[22] Wang S P, Ouyang Z G. The rural-urban income disparity and its effects to economic growth in the case of China[J]. Economic Research Journal, 2007(10): 44-55
[23] Li X J. Economic Geography[M]. Beijing: Higher Education Press, 2004
[24] Zhou B, Wang W, Wang L N. Relationship between cognitive functions and age, education among the elder people[J]. The Journal of Practical Medicine, 2007, 23(1): 117-118
[25] Zhang Z M, Tang C H. How does educational attainment impact occupational stratification: The case of Hubei Province[J]. Chinese Journal of Population Science, 2003(3): 67-73

Note: Figure translations are in progress. See original paper for figures.

Source: ChinaXiv —Machine translation. Verify with original.