

Article

Factors Affecting the Income of Agritourism Operations: Evidence from an Eastern Chinese County

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Abstract: Recently, agritourism has developed rapidly, and contributed considerably to economic and cultural revitalization in rural regions across the world. However, it cannot achieve long-term sustainable development if the operators are unable to enjoy necessary economic benefits. Therefore, the primary objective of this study is to identify the factors that affect the net income of agritourism entrepreneurs. Most previous studies have focused on regional or national incomes flowing from agritourism. This study surveyed all (1050) potential agritourism operators in the Luhe District, an eastern Chinese county. Seventy-two of them were identified as agritourism operators. A regression analysis with a best subset variable selection method of the surveyed data shows that the average agritourism income of three years is significantly affected by seven variables of twenty investigated. Some of those factors were also reported on by previous studies while others were new indicators. The findings highlight the importance of locality for local tourism governments when making regulations to promote agritourism. Finally, we provide some policy implications to promote agritourism in small areas (e.g., counties) in an early stage of development, especially in emerging developing economies such as rural China and many other Asian countries.



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1. Introduction

Over the past four decades, agriculture has been impacted by technological advances, global political changes and accelerated globalization, impacts that are further affecting villages, communities and rural businesses around the world [1,2]. In this context, some farmers have given up farming; others have chosen to diversify their income by reallocating and recombining farm resources (land, labor or capital) into new products or services [3], and many have turned to agritourism that delivers farm-based tourism activities, by, e.g., eight types of agritourism enterprises identified in North America [3]. Agritourism is conducive to sustainable development for its role in increasing farmers' income, revitalizing rural communities and protecting rural landscapes and heritage [4,5]. Moreover, the yearning of urban population for rural life has increased the demand for agritourism. Rural areas are now not only places of production but are also tourist attractions. Those dual identities have helped create many new job opportunities, and agritourism has been expanding rapidly from the established Tuscany in Italy [6–8] to California's Napa Valley [9,10] in the US to outer suburban destinations in emerging developing countries such as Indonesia [11], India [12,13] and China [14–17] in Asia.

Agritourism is usually defined as a range of agriculture-related tourist activities performed in the countryside for the purpose of entertainment or education [18]. It is a combination of agriculture and tourism based on agricultural resources. Many governments have established it as a strategy for sustainable development to assist and encourage farmers to

diversify their entrepreneurial portfolio through tourism and hospitality services [19], in order to facilitate rural development and narrow the urban–rural prosperity gap. Agritourism development can be traced back to the 1850s in Europe, where agritourism definitions are often legally bound to apply incentives or subsidies to their providers [8], such as the EU’s now mature LEADER program where farmers and other rural businesses are offered grants and advice for the promotion of rural development [20]. Agritourism gained momentum in the United States in the late 20th century [21]. In 2002, the U.S. Department of Agriculture (USDA) and the National Agricultural Statistics Service (NASS) incorporated agricultural income data into “recreational income” for the first time in the five-year Census of Agriculture. The income from “agricultural tourism or recreational services” including direct sales were reported to be \$1.01 billion, \$1.78 billion and \$2.01 billion in 2002, 2007 and 2012, respectively [2]. State governments have adopted locally-adapted development strategies for agritourism, such as California’s Small Farms Program [9,22] and Michigan’s programs [23–25].

The pace of agritourism growth in developing countries is, so far, slow and slightly delayed, which is often closely related to national policies for poverty alleviation and rural development [12]. China’s agritourism has burgeoned sporadically from the southern province (Guangdong) that was then newly open to foreigners in the late 1980s [26]. Later in 1998, the China National Tourism Administration (CNTA) launched “China Rural Tour”, a program advocating “eating, living, seeing, and enjoying in the countryside”. Then in 1999, the tourism was developed around the theme of “China Ecological Tour”. In 2005, the 11th 5-Year Plan specified that China would take solid steps to implement recreational agriculture, a new agricultural development model, across the country, especially in counties, towns and villages with convenient transportation to cities, for the construction of a new socialist countryside. Subsequently, the State Council, Ministry of Agriculture and Rural Affairs, the CNTA and the National Development and Reform Commission (NDRC) released proposals, notices, reports and plans for promoting the development of recreational agriculture [14,26,27]. From 2010 to 2013, the No.1 Documents by the State Council called for the development of modern agriculture and for boosting agricultural and rural development. From 2017 to 2019, the No.1 Documents by the State Council suggested fostering new drivers of rural development, expanding channels for increasing farmers’ incomes and strengthening rural industries. As can be seen from the changes in the No.1 Central Document from 1983 to 2020, the Chinese central government has gradually turned from a leadership role to a guidance provider in rural development, embarking on a market-oriented and business-entity path. With this long-term of promotion and development, China’s agritourism has taken off, forming an extensive but spatially concentrated landscape: well-developed in the eastern and central regions, but less-developed in the western region; rapidly developed in the Bohai Economic Rim, Yangtze River Delta, Pearl River Delta and Chengdu-Chongqing Region, but underdeveloped in the western and central regions [28]. Development gaps also exist between provinces, cities, districts, sub-districts and even communities. However, many local governments adopt “one-size-fits-all” policies and rarely pay attention to the differences between and within different regions. As a result, a number of agritourism operators are in a blind, isolated and helpless situation. Putting aside external factors such as regional characteristics, the reason why some operators develop well and others do not is to some extent related to the micro factors amongst the operators themselves.

In a parallel development, tourism policies in China have slowly become aware of and involved with the concept of sustainable tourism generally, and how it could be implemented [29]. There is a growing link between agritourism, tourism in rural areas, sustainable development and the need for profitability. A recent review of developments in sustainable rural tourism stressed how sustainability used to be seen largely as a way to conserve the environment, local cultures and society, but the issue of economic sustainability is also a vital part of the equation [30].

Thus, built on several previous research efforts on how farm/farmer characteristics affect agritourism incomes, our primary objective is to provide further evidence for this topic from a developing country to enrich the current literature. Similar to those published articles, we still try to identify what agritourism attributes are linked to incomes significantly in our study site. We hypothesize that the list of factors may be different from previous findings.

Following this introduction, we briefly review most recently published academic outputs on factors affecting agritourism incomes. We then present the data collection and analysis methods section before the section results. Finally, we compare our findings with previous studies, discuss shortcomings of our project and some future research directions and conclude with some policy implications for local agritourism planning and management to promote an economically sustainable agritourism that is relevant to local characteristics in a small region, especially given a developing economy.

2. Literature Review

Several recent literature reviews on agritourism and rural tourism [5,12,31,32] showed that previous research on agritourism has mainly focused on agritourism's conceptual framework from the supply and demand perspectives [12], including the motivations, investment capability and risks on the supply side; the preferences, infrastructure and promotions on the tourist side; the correlation between agritourism and sustainable development, and innovations in and future trends of agritourism. Relatively, little effort has been made on understanding the mechanisms creating the agritourism suppliers' profiting capabilities (Table 1). One of the earliest publications was conducted in the state of Michigan, USA [21]; 64 questionnaires out of 311 with net income data on agritourism activities were returned from 1500 mailed during late 2002 and early 2003, and the resulting dataset was analyzed by an ordinary least squares (OLS) linear regression indicating that the number of visitors, advertising costs and bus groups positively influenced farms' net income while employee wages negatively influenced it. This study did not include characteristics of farms/farmers such as education, experience or farm size. Barbieri and Mshenga [33] analyzed 449 agritourism farms in North America surveyed in 2005; an interval regression model was applied given that the dependent variable (annual gross income) was categorical. The results showed that the farms' annual gross income was positively linked with six farm and entrepreneurial characteristics: the farmed acreage, length of business activity time, the number of employees, main occupation (farming), gender (male) and the number of association members, while the owner's age had negative influence as it rose, and owner education and the distance from an urban cluster had no significant impact. A more recent report from Taiwan applied quantile regression to 123 agritourism farms surveyed in 2010 and concluded that the financial performance of different groups of farms were determined by different sets of independent variables. For example, the number of employees was positively related to profitability for mid- and high-performance farms, but not for lower ones [34]. In order to understand the economic contributions of agritourism in the state of Michigan, USA, Veeck et al. [35] surveyed 154 family farms in 2013. An OLS multivariate regression analysis revealed that farm gross sales per day were positively related to four variables: advertising costs, off-farm products' retail sales, operation scales and total annual wages, while the number of open days was negatively related. One other significant finding from the study was that a growing economic division between large and small operators existed in the studied region. Lucha and his collaborators [36] surveyed more than 500 agritourism operations in the state of Virginia, USA in 2013, and an ordered logit regression indicated that the perceived profitability of agritourism depended on farmers' education levels and farm size positively, while investment ability and farm location (time to interstate) did so negatively. The most recent relevant study is from South Korea [37]. The researchers obtained agritourism data of 196 farms from nine provinces and used sequential multiple regression to show that the length of time in business, the number of employees, the type of tourism program, availability of attractions, availability

of financial resources and the use of a business/marketing plan all had positive impacts on the annual sales exclusively from the agritourism business.

Table 1. Previous literature on factors affecting agritourism income.

Article	Dependent Variable	Region	Samples	Analytic Methods
[21]	Net income of agritourism activities	Michigan, USA	64	Ordinary least square linear regression
[33]	Categorical gross total sales of farm	North American	449	Interval regression model
[34]	Agritourism income	Taiwan	123	Quantile regression
[36]	Perceived profitability categories	Virginia, USA	189	Ordered logit regression
[35]	Gross sales per day	Michigan, USA	121	Ordinary least square linear regression
[37]	Annual exclusive tourism sales	Nine provinces, South Korea	196	Sequential multiple regression

There are several limits from the previous research on the factors affecting agritourism income. Those studies have focused on farms in developed economies: the lessons learned may not be applicable to developing countries and regions, such as China, where economic characteristics are very different, agritourism is only just burgeoning, there are low levels of education and poor transportation systems in rural areas. Another feature of the current literature is that the data were collected from farms of large areas such as states or provinces, and therefore, may not reflect the variations of studied variables in a relatively small region (such as a county). We also observed that the income data of all previous studies were from one time point (per year), lacking information on financial variations over the long term.

Thus, the primary objective of our study is to enrich the literature by presenting a complimentary case study on how the operation income of agritourism farms in a county in China is affected by various operator and operation attributes in a developing economic context. Our hypothesis is that in addition to the factors that have a significant impact on the agritourism operation net income in the previous studies, there are more potential important factors that could be explored. In other words, the list of significant factors from this study is different from previous efforts. Considering the variables examined in previous studies, we include a more comprehensive list of potential factors grouped into four dimensions, namely, individual farm/farmer characteristics, resources and scale, operation and management and staff training and marketing. We hope that this research can serve as the basis for the local county governments to develop agritourism on the supply side, a reference for agritourism operators to increase their income and supplement agritourism development theory for new agricultural operators.

3. Materials and Methods

Basically, we used questionnaires to collect data on farm and agritourism operations from all agricultural operators in the study site and then applied a regress analysis to identify the factors significantly affecting agritourism incomes. In order to find out which attributes of agritourism operations affect their incomes, often it is not possible to sample all operators in a given study region especially with a large area, for example, of a country or a state. Fortunately, in our case study site, the Luhe District (Figure 1), a county level administrative unit in Nanjing, Jiangsu Province, China, we were able to interview all the potential agritourism operators. This is largely due to the first author being assigned by her working university as an agriculture development counsel to the district, and the Bureau of Agriculture and Rural Affairs of the Luhe District (which registers and maintains the comprehensive list of agricultural operations in the District) granting the first author to administer a project in order to understand the current status of agritourism developments in the district. The list is consisted of 1050 agricultural operators, including 829 family farms, 147 agricultural co-ops and 74 large agricultural enterprises (often with external investment).



Figure 1. Location of the study area in China *. *: adapted from the standard China map available in ArcGIS.

Among the five county-level districts of Nanjing, Luhe is a typical agricultural region and is the farthest from the mega city urban region with the least industrial development but with the largest number of rural villages (2301) and rural land area (132.4 km²), and the second largest rural population (over 340,000). Thus it is relatively poor due to slow growth of high-efficiency agricultural products, low brand awareness and single sales channel of featured agricultural products, even with rich agricultural resources as well as cultural heritage [38], which as advocated by many governments in other regions in China and worldwide, can provide a promising opportunity to develop agritourism and improve the local rural economy.

Due to COVID-19, five graduate students interviewed the agricultural operators by phone calls or online chat depending on the preferences of interviewees from July to December 2020. The survey was conducted in two steps. The first step was to decide if a farming business was linked to agritourism (see Questionnaire I in Appendix A). A total of 728 valid questionnaires (69%) was collected. We provided the definition of agritourism to begin the phone interview and ten types of agritourism activities were listed for reference (Table 2). An operator that provides at least one type of agritourism activity was considered as an agritourism operator. Finally, 97 were determined to be agritourism operators. The second step was to collect details of the agritourism operations (see Questionnaire II in Appendix A). From October to December 2020, we again contacted these 97 agritourism operators to collect more data, and a total of 72 valid questionnaires (74.2%) was collected. In addition, we interviewed some typical operators, local leaders or elite members from several subdistricts and communities in the Luhe District and officials from the Bureau of Agriculture and Rural Affairs.

Table 2. List of agritourism activities.

Activity Type	Description
Farming activities based	For example, planting rice seedlings and rice harvesting
Vegetable/fruits collection	Observing and participating in production, deep processing of vegetables and fruits such as u-pick, jam/juice DIY
Tea gardens	Tea picking, tea drinking, tea art activities and other recreational and education activities such as bike riding and partying in tea gardens
Animal products	Animal feeding, viewing and other entertainment and education activities such as kids birthday partying and animal adoption
Nursery	Viewing, planting, flower arrangement and other recreational and educational activities such as partying and weddings
Grape gardens	Viewing, picking, visiting, wine tasting and other entertainment and educational activities such as partying and weddings
Fishing ponds	Fishing and other leisure activities such as BBQ and camping
Catering services	Eating farm food on a farm or ranch
Lodging	Overnight stays at a farmhouse
Agricultural festivals	Such as strawberry festival, pumpkin festival or agricultural fair

The 20 covariates can be grouped into four primary dimensions (see Table 3): individual farm/farmer characteristics, resources and scale, operation and management and staff training and marketing. Because of the annual fluctuation of agritourism income, we asked operators to report the total revenue of each year for the past three years (2017, 2018 and 2019). We averaged three years' income as the indicator of agritourism operation performance in the following analysis. The multivariate linear regression was used to find the relationship between three years of the average agritourism income and predictors:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p + \varepsilon$$

Since the large number of predictors (20 in our study) and the sample size is relatively small, the best subset variable selection method with Akaike information criterion (AIC) [39] and Akaike's corrected information criterion (AICC) [40] has been employed to capture the critical factors with the outcome as well as drop the redundant variables. The best subsets method is able to select the appropriate model from all possible subset models [41,42]. The model with the smallest AIC or AICC is preferable. For the sake of dependent variable normality assumptions, it is common to transfer the dependent variable income into log(income) in the analysis. The predictor average tourist amount has been standardized to avoid its wide scale. Table 4 shows the multivariate linear regression estimation with the selected variables. Data analysis was conducted using Stata software 16 (StataCorp, College Station, TX, USA).

Table 3. Characteristics for dependent and independent variables.

Dimension	Variable Description	Mean/n *	SD/Percent *	Min	Max
Dependent variable	Average income #	641.96	(1947.44)	5	1333.33
	Age	46.24	(9.15)	26	63
Individual characteristics	Education			0	1
	High school or below	39	(54.17%)		
	Associate or above	33	(45.83%)		
	Motivations			0	1
	Subjective	14	(19.44%)		
	Objective	58	(80.56%)		
	Time devoted to agritourism			0	1

Table 3. Cont.

Dimension	Variable Description	Mean/n *	SD/Percent *	Min	Max
	1 to 10 years	19	(26.39%)		
	11 years and above	53	(73.61%)		
Resources and scale	Operation Type			0	1
	Family owned and co-ops	51	(70.83%)		
	Large agricultural enterprises	21	(29.17%)		
	Average productive land area #	490.35	(597.59)	30	3600
	Distance from tourist attractions (KM)	13.95	(12.09)	0.5	30
	Land area of agritourism farm (m ²)	153.93	(283.58)	5	2000
Operation and management	Number of agritourism activities	2.44	(1.58)	1	6
	Number of available agritourism facilities	3.11	(1.83)	1	7
	Sells non-agricultural products			0	1
	No	61	(84.72%)		
	Yes	11	(15.28%)		
	Sells agricultural products			0	1
	No	14	(19.44%)		
	Yes	58	(80.56%)		
	Days open to the public	199.01	(138.03)	10	365
	Average tourist numbers per year #	6306.24	(12,977.17)	50	73,333.34
Average tourist stay time, in hours #	3.14	(1.46)	0.83	6.33	
Staff training and marketing	Staff training			0	1
	No	49	(68.06%)		
	Yes	23	(31.94%)		
	Road signs			0	1
	No	48	(66.67%)		
	Yes	24	(33.33%)		
	Electronic map markers			0	1
	No	24	(33.33%)		
	Yes	48	(66.67%)		
	Average professional staff amount #	2.32	(3.75)	0	22.67
Average non-professional staff amount #	2.73	(5.84)	0	30	

* Data are presented as mean (SD) for continuous measures, and n (%) for categorical measures; #: Average value of 2017, 2018 and 2019.

Table 4. Results of multivariate linear regression with selected variables.

Log(Income)	Coefficient	Robust Standard Error	t	p-Value	95% Confidence Interval	
Operation Type (x_1)						
Large agricultural enterprise (reference)						
Family owned and cooperation	−1.33	0.43	−3.08	0	−2.19	−0.47
Road signs (x_2)						
No (reference)						
Yes	0.78	0.35	2.24	0.03	0.08	1.47
Sells non-agricultural products (x_3)						
No (reference)						
Yes	−0.89	0.46	−1.93	0.06	−1.81	0.03
Sells agricultural products (x_4)						
No (reference)						
Yes	0.61	0.34	1.77	0.08	−0.08	1.30
Number of agritourism activities (x_5)	0.20	0.09	2.25	0.03	0.02	0.37
Average tourist numbers (standardized, x_6)	−0.31	0.15	−2.04	0.05	−0.61	−0.006
Average productive land area (x_7)	0.0006	0.0003	1.83	0.07	−0.00005	0.001
Constant	4.5	0.52	8.59	0	3.46	5.56
AIC	240.04					
AICC	242.94					

AIC: Akaike information criterion; AICC: Akaike's corrected information criterion.

4. Results

4.1. Descriptive Statistics

4.1.1. Individual Characteristics of Agritourism Operators

The majority of agritourism operators were middle aged (46 years on average) and 45% of them had educations lower than high school. However, almost three quarters of them have engaged in agricultural production longer than 11 years. The motivations for them engaging in agritourism were complicated. Objective motivations included increasing income, creating jobs for family members, seeing the demand of the tourism market and making full use of resources; subjective motivations were divided into being out of interest, accompanying visitors and tourists and educating tourists. More than 80% of operators were dominated by objective motivations with slightly fewer than 20% giving subjective motivations.

4.1.2. Resources and Scale of Agritourism Operation

Though less than one-third of the agritourism farms in the Luhe District are large agricultural enterprises (often with external investment), they dominated by the size of agricultural land as of 3.5, 4.4 times family farms, co-ops, respectively. In terms of the size of land used for agritourism, the difference was similar between the large agricultural enterprise and family farms (3.2 times), and the difference between the larger agricultural enterprise and co-ops was smaller (1.6 times) indicating that co-ops used larger portions (77%) of their land for agritourism activities. All of the agritourism farms were relatively close to the nearest tourist attractions: 14.2 km from family farms, 9 km from cooperatives and 14.8 km from large agricultural enterprises, and this indicated that their locations were well chosen to take advantage of existing tourism facilities.

4.1.3. Operation and Management

The most popular agritourism activity operated by the farms was fishing (45.83%), followed by catering services (40.28%). The average number of activities available was 2.44 out of 10 types of agritourism activities. Only 54.17% of the operators possessed "entrance facilities" which are of vital importance, 56.94% offered parking space, 50% had catering facilities and only 12.5% provided accommodation facilities. It was observed that 80.56% of agritourism operators were selling agricultural products, but only 15% were selling non-agricultural products. From 2017 to 2019, family farms were open to tourists for 174 days on average per year, cooperatives for 263 days and leading enterprises for 238 days.

4.1.4. Staff Training and Marketing

Marketing is critical to attracting potential clients and staff training is important to provide good service quality to encourage re-visits. The average number of full-time and part-time staff was 2.32 and 2.73, respectively, without significant differences among the three types of operations. However, only 31.94% of farms provided professional training to employees, such as sales, service, tour guides and scientific knowledge on agriculture. Specifically, 28.9% of family farms, 16.7% of cooperatives and 42.9% of large agricultural enterprises did. In terms of marketing, 20% of family farms had road signs, 66.7% of cooperatives and 52.3% of large agricultural enterprises. Most large agricultural enterprises (95.2%) and cooperatives (83.3%) could be found on electronic maps while only more than half of the family farms (51.1%) could, and this big gap may attribute to the education levels of operators.

4.2. Regression Analysis

We used the best subset variable selection method with AIC and AICC criteria (Table 5), and obtained 7 variables including agritourism operator type, road signs, selling non-agricultural products, selling agricultural products, number of agritourism activities, average tourist numbers (standardized) and average productive land area that significantly

affected the average farm incomes generated from agritourism operations from 2017 to 2019 in the Luhe District. We then conducted multivariate linear regression using log-transformed income with these 7 selected variables. The constructed final multivariate linear regression is as follows:

$$\log(y) = 4.5 - 1.33x_1 + 0.78x_2 - 0.89x_3 + 0.61x_4 + 0.2x_5 - 0.31x_6 + 0.0006x_7 + \varepsilon,$$

As Table 4 shows, the average income (log-transformed) would increase by 1.33 units at large agricultural enterprises. Operations with road signs had 0.78 units of more income (log-transformed) gain, compared to those without road signs. Operations with non-agricultural product sales had 0.89 units of average income (log-transformed) decreasing, compared with those that did not sell non-agricultural products. Operations with agricultural product sales had 0.21 units of income average income (log-transformed) more than operations without agricultural products sales. The number of agritourism activities increased 1 unit; the average income (log-transformed) increased 0.2 units. Surprisingly, more tourists did not guarantee more income. The average income (log-transformed) had a positive relationship with the average productive land area, even though the gain was small (0.0006 units). We also examined that there was no multicollinearity issue by using the variance inflation factor (VIF) regarding the model we built (Table 6). The residuals also followed normality assumptions (Figure 2).

Table 5. AIC and AICC values for fitted models.

Number of Predictors	AIC	AICC
1	250.50	250.85
2	247.94	248.53
3	245.58	246.49
4	243.29	244.58
5	242.47	244.22
6	240.74	243.03
7*	240.04	242.94
8	240.32	243.93
9	240.97	245.37
10	241.69	246.98
11	243.36	249.64
12	245.11	252.48
13	246.90	255.47
14	248.79	258.68
15	250.69	262.03
16	252.65	265.55
17	254.63	269.24
18	256.61	273.08
19	258.61	277.09

* The AIC and AICC values indicate that the model with 7 variables is the best one.

Table 6. VIF scores for the regression coefficients.

Variable	VIF *
Operator Type	1.65
Road signs	1.33
Sells non-agricultural products	1.09
Sells agricultural products	1.16
Number of agritourism activities	1.07
Average tourist numbers (standardized)	1.16
Average productive land area	1.61
Mean VIF	1.3

* VIF greater than 10 indicates collinearity issue.

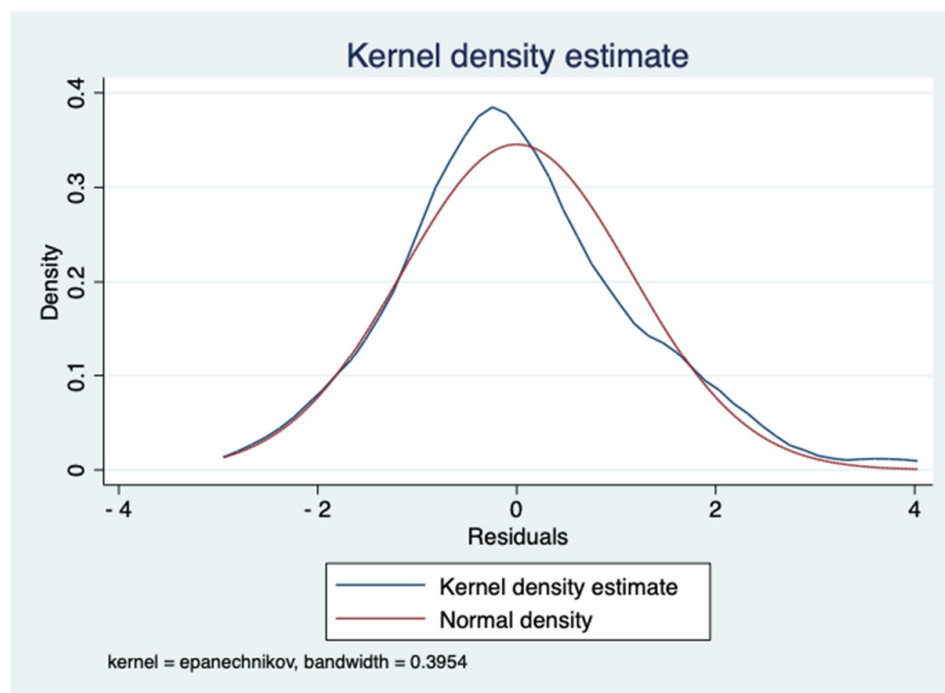


Figure 2. Residual plot from our multivariate linear regression analysis.

5. Discussion

Compared to previous studies, our county-level case study provides a relatively different set of farm operator attributes that impact agritourism incomes. First, and surprisingly, none of the individual agritourism operator characteristics (age, education, experience and motivation) in our study were found to be significantly important, while Barbieri and Mshenga showed that business age, gender and age [33] and Lucha and collaborators indicated that education level [36] were significantly related. This is likely due to the early stage of agritourism development in this region, and the capability of attracting agritourism tourists are mainly increased by the operation resources and scales as most of the significant factors are dimensions of resources and scales and operation and management. We could predict that as the further development of agritourism and the increasing competition of the agritourism market grows, these individual level factors will play more important roles in increasing agritourism operation efficiency and thus improve revenue and income.

Second, we observed that large agricultural enterprises in the Luhe District dominated agritourism development; a similar phenomenon was found in Michigan, USA [35] and those enterprises could generate income more efficiently than smaller scales operations including family farms and co-op farms. The reason behind this is likely to be that such enterprises attracted more investment from outside investors and thus could hire more professionally trained staff and invest more in operations with better quality of services. However, these large-scale enterprises often attract staff from outside and provide fewer job opportunities to local communities, and this is contrary to one of the original purposes of developing agritourism: to revitalize the local farming communities. Local governments should be cautious to attract outside investment for local agritourism development. Alternatively, with help from local governments and universities, managers of local farms or co-ops may be trained to improve their agritourism operation to be more competitive to the large operations. Another operation scale factor (average productive land area [35,36]) was also shown that it can increase agritourism income. Therefore, it could be promising if several farms should be encouraged to combine as co-ops farms for agritourism development.

Third, it seems that generally the more activities a farm provides, the more income it generates as several previous studies showed [15,35]. Considering that most of Luhe's agritourism operators are poorly educated without systematic learning and comprehensive

understanding of the emerging industry they are engaging in, it is challenging for them to design different farm-based recreational and educational activities and efficiently operate these activities, not to mention marketing them. From the survey, 27% of respondents say they need technological and training support, which is understandable since they are at the initial stage of agritourism development [43]. Therefore, one way to tackle this issue is that local tourism planning units could invite successful agritourism entrepreneurs from other developed regions to teach and train local farmers. One advantage open to farmers running agritourism businesses is to directly sell products such as their crops, fruits from their farms, etc., to tourists, as evidently shown in our study region. However, the sales of non-agricultural products and the number of tourists attracted are not positively linked to more income and this is contradictory to common knowledge about the tourism industry [35]. Perhaps the number of non-agricultural products is not large enough and the consumption per tourist is relatively small, thus not generating significantly more income. In other words, the agritourism operation in the study area is not yet efficient and has more areas to improve.

Lastly, from the dimension of staff training and marketing, road signs are significantly linked to operational income while electronic map markers and all other staff training factors are not significant. Our survey showed that all the agritourism farms in the Luhe District were well-chosen and relatively close to the nearest tourist attractions so the challenge for some tourists, even those from local areas, is probably more to find the exact location through road signs. This may not be true for tourists from far off areas who may need to find destinations on electronic maps first before deciding to visit. Road signs and electronic map markers could also be good commercial advertisements, especially when tourists do not have any travel plans. These signs and marks carry and publicize information regarding specific tourist spots; thus they can be a part of a complete information system if combined with marketing activities and other tourism information. The insignificance of training factors is probably also due to the area being in the initial stage of agritourism development in the study area, which will most likely move to the next development stage featuring more competition which requires more training and education for operators and their staff.

6. Conclusions and Recommendations

There appears to be no universally agreed set of factors that contribute to increasing or decreasing agritourism incomes. We present a case study from a small region (the Luhe District) that is far from a mega city in which operation type, road signs, agricultural product sales, number of agritourism activities and productive land area significantly increase agritourism operational incomes, while non-agricultural product sales and the number of tourists attracted are negatively associated with agritourism income. Although, some factors are consistent with other similar research findings in different areas, we found out that other attributes of farmers or their operations are critical in our project area. Our study demonstrates that it is complicated and challenging to develop profitable agritourism even just for economic purposes, which is often one of the most important motivations for farmers, and there is no one panacea of development strategy for operators and government units to follow. Thus, this requires that local agritourism planning and management units collect data, e.g., through surveys, from local potential and existing farmers, often and timely, regularly to understand their needs and challenges and then can prescribe data-based, relevant and needed measurements to help them develop their agritourism financially and sustainably.

Specifically, our survey results indicate that even though the number of large agritourism operators is small, they dominated the agritourism development scene by attracting more tourists and generating income more efficiently than family farms and co-ops, which to some extent contradicts the original purpose of agritourism development in rural areas, that is to generate more local jobs and thus improve the economy of local farming communities. In accordance with the national campaign of promoting agritourism to revitalize rural

areas, the local agritourism should shift the investment to local under-educated and under-trained farmers who are currently running agritourism or intend to start new agritourism businesses, thereby increasing their competence in business management and marketing. Only 97 (less than 10%) of 1050 agricultural operators currently provide some agritourism activities in the study area. The potential to develop agritourism in this region is still huge and could take advantage of local rich agricultural and cultural resources. At the same time, the operators should be rational investors in agritourism, it is an entrepreneurial activity with many potential risks. To succeed against the competition they have to master the basic knowledge of operation and management, grasp market opportunities, develop distinctive tourism products and services and conduct marketing and promotion by informatization. Among them, the deep processing of agricultural products, brand planning and marketing and quality control management, for which local governments may provide technical training and economic incentives, are especially helpful to gain higher added value and increase income.

From the global perspective, agritourism has become a political tool and economic strategy to revitalize regional economies and protect rural communities and resources. In this context, the development of micro-level agricultural operators and the growth of the agritourism net incomes are closely related to the sustainable development of and even beyond the whole industry. It is important and efficient for agritourism operators, planners and policy makers from the early stages of agritourism development to learn experiences from those in later stages and find the best strategies adapted to their locality. This study presents a recent experience from a relatively small region in a developing economy context hopefully enhancing the academic and practical understanding of how different farmer and operation characteristics can affect agritourism income in different regions worldwide.

The limitation of our study is that agritourism operations samples are all from the Luhe District, a typical rural area in Jiangsu province, China. This resulted in our findings potentially being an inference to areas which had similar characteristics to the Luhe District in China. As a developing country, China has unbalanced regional development; the social and economic environment may be different even in one province. In future studies, the robustness of the results and conclusions could be enhanced based on randomly selected agritourism samples from the different rural areas in various Chinese provinces, to reduce the selection bias. Another research direction critical to understanding the factors affecting agritourism incomes worldwide and an extension to our current effort is to systematically and periodically collect, investigate, analyze, compare and summarize data on agritourism operations with various conditions across the world [1].

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Appendix A

Two questionnaires (translated into English from Chinese) used in the study are included.

Appendix A.1 Questionnaire I

Appendix A.1.1 Preface

Dear Agricultural Business Operator(s),

Hello! In order to understand and make sure whether an agricultural business is currently engaged in agritourism and prepare for the follow-up agritourism survey questionnaire, our bureau specially carried out this screening questionnaire survey. We sincerely thank you for the truthful information you provide and promise not to disclose the relevant information of each business entity. Your participation is of great significance to our office in formulating agricultural tourism strategies and policies in the future!

In order to let everyone better fill in the questionnaire, we have sorted out the definition and reference items of agritourism:

(1) Definition of agritourism:

In the rural areas, the use of agricultural natural environment, pastoral landscape, agricultural production, agricultural management, agricultural facilities, farming culture and farm life and other tourism resources, to provide tourists with sightseeing, leisure, vacation, experience, entertainment and fitness and other needs of tourism business forms.

Agritourism is a form of tourism associated with agricultural production and occurs on farms, pastures, forest farms, nurseries and other working farms or non-working farms. Agritourism is a kind of industrial tourism, which refers to a new industrial form based on agricultural activities and combining agriculture and tourism.

(2) List of agritourism activities:

- Participatory activities such as fruit and vegetable planting + picking and on-site sales of fruit and vegetable products;
- Participatory activities such as tea garden + picking and on-site sale of tea products;
- Animal products + participatory activities and on-site sales of products;
- Nursery, botanical garden + participatory activities and on-site sale of products;
- Grapes, wines + participatory activities and on-site sales of products;
- Agricultural environment + catering services;
- Agricultural environment + accommodation products and services;
- Agriculture, pasture, forestry, nursery and other work farms + festivals.

As long as your operation provides any of the above, your business can be defined as participating in agritourism.

The Luhe District Agriculture and Rural Bureau of Nanjing
June 2020

Appendix A.1.2 Questionnaire for Screening Agricultural Businesses Engaged in Agritourism Operations in the Luhe District

1. Your full name is _____, and live on _____ street.
2. Your address is _____.
The contact number for inquiries is _____.
3. The agricultural production you are engaged in (e.g., planting, breeding, comprehensive breeding) are: _____.
4. How many years have you been engaged in agricultural production (planting, breeding, comprehensive breeding)? (Single selection).
 - A. 1–5 years
 - B. 6–10 years
 - C. 10–15 years
 - D. 16 years or longer

5. At present, what is the situation of your agritourism in agricultural production (planting, breeding, comprehensive breeding, your agricultural environment)?
 - A. There is no agritourism at present and will not be considered in the future.
 - B. There is currently no agritourism, but it is under consideration,
 - C. Preparations for agritourism are under way.
 - D. Agritourism has already begun, starting at the time.
6. What conditions are necessary for you to develop agritourism? What kind of help do you need?
_____.

Thank you very much for your cooperation! What you fill in will be of great significance to our work!

Appendix A.2 Questionnaire II

Research on the Value Added and Development Strategy of Agritourism to Agricultural Operations of the Luhe District

Dear Agricultural Business Operator(s):

Hello! This survey is designed to collect statistics and sort out the current situation of agritourism in the Luhe District and understand the promotion and income increasing of agritourism on agricultural business entities in the district. We hope the data can help the bureau scientifically judge and rationally plan the development direction and strategy of agritourism in our region.

Our office sincerely appreciates your time and the data and information you provide and promises not to disclose the relevant information and business data of each business. Your participation is of great significance to our unit in formulating agritourism strategies and policies in the future!

The Luhe District Agriculture and Rural Bureau of Nanjing

1. Your business name is _____ [the name of business entity] and your business address is _____.
2. What type of agricultural business entity are you? [Multiple choice]
 - A. State-owned forest farms, state-owned farms
 - B. Leading enterprises
 - C. Cooperatives
 - D. Family farm
 - E. Beautiful rural village collective
 - F. Other _____
3. How many years have you been engaged in agricultural production (planting, breeding, comprehensive breeding, etc.)?
 - A. 1–5 years
 - B. 6–10 years
 - C. 10–15 years
 - D. 16 years or longer
4. In 2019, your productive area (planting, breeding, comprehensive breeding, etc.) has _____ mu. The main production is _____. The average annual output value per mu is _____ ten thousand yuan. [Fill in the blanks].
5. In 2018, your productive area (planting, breeding, comprehensive breeding, etc.) has _____ mu; the average annual output value per mu is _____ ten thousand yuan. [Fill in the blanks].
6. In 2017, your productive area (planting, breeding, comprehensive breeding, etc.) has _____ mu; the average annual output value per mu is _____ ten thousand yuan. [Fill in the blanks].
7. You joined the agritourism program in _____ year and the agritourism program covers an area of _____ mu. [Fill in the blanks].

8. Your agritourism project is: (please check, according to the actual situation, you can select a single choice or multiple choices) [Multiple choice question]
 - A. Crops + tourism activities
 - B. Fruit and vegetable gardens + tourism activities
 - C. Tea plantation + tourist activities
 - D. Animal products + tourism activities
 - E. Nurseries, botanical gardens + tourism activities
 - F. Grapes and wines + tourist activities
 - G. Fish pond + tourist activities
 - H. Agro-environment + catering services
 - I. Agri-environment + accommodation products and services
 - J. Farm + festivals for agriculture, pastures, forest farms, nurseries and other work
 - K. Not in the above options, is _____
9. The tourist facilities you currently have are: (Please check according to the actual situation, you can select a single choice or multiple choices) [Multiple choice question]
 - A. Entrance facilities (gates, signs, etc.)
 - B. Parking space, how many square meters of area _____
 - C. Dining space, how many square meters of area _____
 - D. Accommodation space, how many rooms _____
 - E. Outdoor activity space, how many square meters of area _____
 - F. Indoor event space, how many square meters of area _____
 - G. Not in the above options, is _____
10. When you open up agritourism, do you sell agricultural products at the same time?
 - A. Not available (skip to question 12)
 - B. Sale (skip to question 11)
11. If it is sold, does your agricultural product have its own brand?
 - A. No brand
 - B. There is a brand, and the brand name is _____
12. In addition to selling agricultural products, do you also sell related non-agricultural products?
 - A. No
 - B. Yes, please specify _____
13. Are there tourist attractions near you?
 - A. No
 - B. Yes, how many kilometers away from you _____ km
14. On the way to your business, is there a name sign to guide visitors to your place?
 - A. No
 - B. There is one that is _____
15. Can I find your location on Baidu Map, AutoNavi Map, etc.?
 - A. No, you cannot
 - B. Yes
16. Have your agritourism staff received any vocational training related to agritourism? (e.g., service training, sales training, risk training, etc.)
 - A. No
 - B. Yes, they are _____
17. What are your motivations to participate in agritourism? [Multiple choice question]
 - A. Increasing revenue
 - B. Employment of family members
 - C. Meeting the demand in the tourism market
 - D. In order to make full use of resources

- E. This is our hobby
 F. Accompany visitors
 G. Educating tourists
 H. Not in the above options, is _____
18. In 2019, your agritourism project will earn about _____ ten thousand yuan
 In 2018, your agritourism project earned approximately _____ ten thousand yuan
 In 2017, your agritourism project earned approximately _____ ten thousand yuan
19. In 2019, your investment in agritourism is _____ ten thousand yuan; the government awards _____ ten thousand yuan.
 In 2018, your investment in agritourism was _____ ten thousand yuan; the government awards _____ ten thousand yuan.
 In 2017, your investment in agritourism was _____ ten thousand yuan; the government awards _____ ten thousand yuan. [Fill in the blanks].
20. In 2019, you will have _____ full-time staff and _____ part-time staff engaged in agricultural tourism.
 In 2018, you had _____ full-time staff and _____ part-time staff engaged in agricultural tourism.
 In 2017, you had _____ full-time employees and _____ part-time employees engaged in agricultural tourism. [Fill in the blanks].
21. In 2019, your agritourism will be open to the public for _____ days per year. (Please fill in the total number of days in a year).
 In 2018, your agritourism was open to the public for _____ days per year.
 In 2017, your agritourism was open to the public for _____ days per year.
22. In 2019, your annual number of visitors is _____; the average residence time is _____ hours (please fill out the visitors to stay the number of hours).
 In 2018, your annual number of visitors was _____; the average residence time was _____ hours.
 In 2017, your annual number of visitors was _____; the average residence time was _____ hours. [Fill in the blanks].
23. What problems and difficulties do you encounter when you develop your agritourism?
 _____.
24. Does COVID-19 have an impact on your agritourism? What is it?
 _____.
25. In your opinion, in what areas does the local government need to provide you with support and assistance to help the development of agritourism? [Fill in the blanks].
 _____.

Thank you very much for your cooperation! What you fill in will be of great significance to our work!

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