

Sustainable Livelihood of Households in Tourism Destination: Evidence From in the Wulingyuan World Heritage Site

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ABSTRACT

In the process of resource protection and development of World Heritage Sites, the sustainability of the livelihoods of heritage site residents is one of its important tasks. Taking Wulingyuan, a world heritage tourism site, as an example to construct the livelihood evaluation index system of households, and use the participatory farmer survey method to conduct household surveys on households. Based on livelihood strategies, households are divided into different types of livelihood, their livelihood capital is assessed, and their livelihood obstacle factors are identified. The research results show that: Under the influence of rural tourism development, households' livelihood capital has been improved as a whole. There are differences in the level of livelihood capital of different types of households. From high to low, they are: tourism-dominant type, working-dominant type and agricultural--dominant type. The World Heritage Site households' Sustainable Livelihood Obstacle Index is ranked from high to low as social capital, human capital, financial capital, natural capital, and physical capital; the top three indicators are: online social media, social network support, family farmland area. Different types of households have different obstacles, social capital is the biggest obstacle in common among the three types of households, and the primary obstacle is online social media.

KEYWORDS

livelihood capital; obstacle degree; World Heritage Tourism Destination; Zhangjiajie Wulingyuan.

INTRODUCTION

The livelihood of households is an important factor that drives the evolution of the relationship between the humans and land in rural areas. As the core of households' issues, sustainable development of livelihood is the foothold of rural revitalization, acting as the key to promoting common prosperity in rural community (Lin & Wen, 2021). Rural tourism has been regarded as an effective catalyst for rural revitalization as it is embedded in the countryside as an external force. The growth, stagnation or fluctuation of rural tourism will have a direct impact on the livelihood of households at the destinations.

Under the combined effect of the rational needs of internal survival and the interest of rural tourism, the traditional livelihood combination mode of households has been changed. In the process of resource protection and development of World Heritage Sites, the sustainability of the livelihoods of heritage site residents is one of its important tasks (Zhang & Wen, 2013). With the gradual rise of the "heritage fever", the economic, social and cultural influences of tourism on the surrounding households have become more and more obvious, which makes the changes in the livelihoods of the residents of the heritage sites aroused the attention of many scholars (Xia et al., 2017; Wang et al., 2016). This research attempts to

explore the relationship of tourism and household livelihood at Wulingyuan World Heritage Site (WWHS) in China.

LITERATURE REVIEW

In the process of resource conservation and development of world heritage sites, the sustainability of the livelihoods of the inhabitants of the sites is one of its important tasks. From the 1980s, scholars have started to apply the concept of "livelihood" in tourism studies (Chambers, 1986). With growing tourism and concerns on its negative impacts, institutions are conducting more explorations on sustainable livelihood. Among which, the sustainable analysis framework proposed by the UK Department for International Development is the most recognized guide (Tang, 2015).

Livelihood capital is the core of the sustainable analysis framework (Su et al., 2009). Scholars agree that livelihood capital has a huge impact on the intergenerational transmission of poverty, and it is imperative to strengthen the diversification of livelihoods in order to improve the status quo of poor households (Wu et al, 2019). Livelihood strategies are often combined with livelihood capital to assess and discuss rural poverty and seek development solutions (Luo et al., 2019). Different types of villages have diverse needs for tiered livelihood strategies (Fang et al., 2014; Kim, 2021). Xu (2019) believes that the subsistence capital structure and subsistence strategy of the sample of households are not very different in various types of villages. Few households choose part-time jobs, and farming is not the choice of most households. Human capital is the most important livelihood asset of households, and it is very important to natural resources. The dependence on capital is small (Xu, 2019).

In the process of tourism activities, the radiation range is large. Hence, tourism may provide different livelihood options for the indigenous people. More disadvantaged areas have adopted tourism as a local sustainable livelihood strategy (Teresa, 2008). With the in-depth research on rural revitalization and tourism poverty alleviation, Su et al. (2019) believe that agricultural tourism and local employment in Anhui, China, are complementary, and the development of tourism in rural areas can help reduce the impact of seasonality. Researchers have brought cultural capital and institutional capital into livelihood capital for comparative analysis, and found that households' livelihood capital has strong rigidity and is less sensitive to natural capital. Physical capital, social and cultural capital can better promote households' availability. Sustainable development (Zhang, 2009; Wang Rong et al., 2021), tourism development is a long-term adaptation process, in order to achieve the sustainable development requirements of rural revitalization, it is necessary to formulate reasonable plans in the process of policy formulation and tourism development to help households better transformation (Li et al, 2020; Xue 2019). Through the operation of farmhouses, inns, tourist shops and domestically, with the in-depth research on rural revitalization and tourism poverty alleviation, Tourism development is a long-term adaptation process. In order to achieve the sustainable development requirements of rural revitalization, policy formulation and tourism in the development process, formulate reasonable plans to help households make better transitions (Li et al, 2020; Xue 2019). households have participated in the tourism industry by operating farmhouses, inns, tourist shops, and working in scenic spots. Various livelihood methods have emerged, such as tourism franchise, tourism franchise and balanced concurrent operation. Their livelihood strategies have been expanded and their livelihoods have increased and sustainability is improved.

The community-based development model of the Huangshan heritage site has more opportunities for households to participate in tourism, so the livelihood stability and sustainable performance of households in the heritage site have been greatly improved (Su

et al., 2019). Zhangjiajie Wulingyuan ecological resettlement has changed the original livelihood environment of households. The physical capital of the relocated households is significantly higher than that of the original households, the social capital is the lowest, and the dependence on tourism is reduced. The scale of their participation in tourism and tourism income are lower than those of the original households (Wang, Li & Yi, 2016).

To sum up, a large number of literatures have carried out qualitative and quantitative research on the livelihood of households in heritage sites, with the main research contents focusing on the relationship between livelihood capital and livelihood activities, the relationship between livelihood diversification and land use, the impact of tourism on the livelihood of rural residents, sustainability of rural livelihoods, compensation for landless households' interests, and the impact of social security on households' livelihoods. The academic community has paid more attention to tourism poverty alleviation and sustainable livelihood, but the discussion on tourism poverty alleviation and regional sustainable development after poverty alleviation is still shallow and needs to be explored more.

Overview of the study area and research design

Study area

Wulingyuan World Natural Heritage Tourist Site is located in the hinterland of Wuling Mountains in the northwest of Hunan, China. The administrative area belongs to Zhangjiajie City, Hunan Province, with a total area of 397.58 square kilometers. Wulingyuan is a scenic spot famous at home and abroad for its rare quartz sandstone peaks and forests. On December 14, 1992, the UNESCO World Heritage Committee officially approved Wulingyuan to be included in the "World Heritage List", and Wulingyuan became China's first batch to be scenic area of world natural heritage. In the mid-1980s, Wulingyuan Scenic Area began to open to the outside world to develop tourism. Tourism is the primary pillar industry in Wulingyuan District, Zhangjiajie. Wulingyuan District of Zhangjiajie City was formed from the three most remote and backward partial towns and villages in the former Dayong County, Sangzhi County and Cili County. The original poverty area was large and the degree of poverty was deep. Relying on the growing tourism industry, Wulingyuan District has achieved remarkable results in targeted poverty alleviation through tourism. In 2017, Wulingyuan District became one of the first districts and counties in Hunan Province to get rid of poverty. This study takes Qinglongya Village, Huangjiaping Village, Shuangxing Village and Shuangwen Village in the south gate of the core scenic spot of Wulingyuan District as the research objects.

Classification of Farmer Types

Under different capital conditions, farmers will choose various livelihood strategies. Considering the particularity of world natural heritage tourism sites, and Zhangjiajie as a remote and backward mountainous area, traditional agriculture, forestry and migrant work are important livelihood strategies. Farmers in Wulingyuan are divided into three types according to their income structure, including tourism-dominant type (tourism income $\geq 70\%$), working-dominant type (working Income $\geq 70\%$), and agricultural-dominant type (agricultural income $\geq 70\%$). The specific classification criteria are shown in Table 1.

Table 1. Types and classification criteria of households' livelihoods

Subsistence Type	Classification Indicators (%)	Livelihood Mix	Representative Livelihood Activities
Tourism-dominant type	Tourism Income \geq 70	Participate In Tourism + Short-term Employment + Farming	Operating Homestays, Hotels, Restaurants, Farmhouses, Food, Beverages, Fruit, Plantation Picking, Tourism and Transportation, Scenic Staff, Tour Guides
Working-dominant type	Working Income \geq 70	Perennial Worker + Participate In Tourism	Scenic Stalls, Hotels, Restaurants, Scenic Spot Security, Shopping Malls, Working Outside, construction odd jobs, coach drivers
Agricultural-dominant type	Agricultural Income \geq 70	Farming+ Short-term Employment + Participate In Tourism	Agriculture, Specialty Planting and Breeding, Temporary Employment

Indicator System

This paper selects 5 livelihood capital and 21 secondary indicators of human capital, natural capital, material capital, financial capital and social capital. Based on the selection of indicators from the previous research results of households' livelihood capital calculation in rural tourism destinations, and combined with the actual livelihood situation of households in the case area, this paper constructs the analysis framework of households' sustainable livelihood. See Table 2 for specific indicators.

Table 2. The indicator system for the evaluation of livelihood sustainability of households in poverty alleviation areas through tourism

First-level Indicator	Secondary Indicators	Unit
Human Capital (H)	H1 average Age of Adult Labor Force (years)	18~30=1, 31~45=0.75, 46~56=0.5, Above 56=0.25
	H2 The Highest Educational Attainment of The Adult Workforce	Primary and below =0.25, Junior School =0.5, High School=0.75, Junior College or Above =1
	H3 Adult Labor Force (People)	0 People=0, 1 People=0.25, 2 People =0.50, 3 People=0.75, 4 People and More=1
	H4 Health Status of Family Members	Poor=0, Fair=0.25, Average=0.5, Good=0.75, Excellent =1
Nature Capital (N)	N1 Farmland Area	The actual numerical
	N2 Forest Area	The actual numerical
	N3 Farmland Quality	Poor=0, Fair=0.25, Average=0.5, Good=0.75, Excellent =1
Material Capital (W)	W1 Housing Type	Civil House =0.25, Adobe House =0.50, Brick House =0.75, Concrete Room =1
	W2 Housing Quality	No Decoration=0.25, Simple Decoration=0.5, Hardcover =0.75, Luxury Decoration =1

	W3 Housing Area (m ²)	Below 100 =0.25, 100~200=0.50, 200~300=0.75, Above 300=1
	W4 Household Electrical Appliances and Technology Products	Mobile Phone =0.1 TV =0.1 Washing Machine =0.2 Refrigerator =0.2 Computer =0.2 Air Conditioner =0.2
	W5 Means of Transportation, Business Facilities and Equipment, Production Tools, etc.	None =0, Bicycle =0.1, Motorcycle =0.2, Family Car =0.4, Equipment and Material for Tourism Business =0.3, Tractor =0.2, Plow or Other Production Tools =0.1
Financial Capital (F)	F1 Annual household income (RMB)	Less than 4500¥=0, 4500 to 10000¥=0.25, 10001 to 30000¥=0.50, 30001~5 0000 ¥=0.75, Above 5 0000¥=1
	F2 Household Savings (RMB)	None = 0, 10000¥ or below =0.25, 10000 ~ 30000¥=0.50, 30000 ~ 50000¥=0.75, 50000 and above =1
	F3 Household Debt (Loan) (YUAN)	None = 0, 10000 and below =0.25, 10000 ~ 30000¥=0.50, 30000 ~ 50000¥=0.75, 50000¥ or More =1
	F4 Access to Credit for Households	Rural Usury =0, Bank loan =0.25, Relatives and Friends Loan =0.50, Government Aid =0.75, Interest-free Bank Loan =1
	F5 Subsidized Income	If no = 0, 1 ~ 500 yuan = 0.25, 501 ~ 1000 yuan =0.50, 1001 ~ 2000 yuan =0.75, Above 3000 yuan =1
Social Capital (S)	S1 Social Network Support	If no =0, 1 =0.25, 2 =0.50, 3 =0.75; Get 4 or More =1
	S2 Relatives and Friends Engaged In Occupational Types	Village cadres or government workers =0.3, business workers =0.3, education and medical workers =0.2, tourism workers =0.2, none =0
	S3 Whether To Use The Internet and Social Media To Start A Business or Trade Agricultural Products	Yes=1, No =0
	S4 Socialize With Villagers	Poor=0, Fair=0.25, Average=0.5, Good=0.75, Excellent =1

RESEARCH METHODS

Comprehensive Level Evaluation Model

Firstly, the index values are dimensionless, then the entropy method is used to determine the index weight, and the comprehensive evaluation model is used to measure the sustainable livelihood level. The formula is as follows:

① Build basic data matrix: $A = (a_{ij})_{m \times n}$ (1)

② Normalize the judgment matrix to obtain the normalization matrix: $X = (x_{ij})_{m \times n}$ (2)

It has positive effect $x_{ij} = (A_j - \min A_j) / (\max A_j - \min A_j) + 0.001$

③ Determine the entropy value of each evaluation index:

$$f_{ij} = x_{ij} / \sum_{i=1}^m x_{ij} \quad (3)$$

$$e_j = -(1/\ln(m)) \times \sum_{i=1}^m (f_{ij} \times \ln(f_{ij})) \quad (4)$$

④ Determine the weight of each evaluation index:

$$g_j = 1 - e_j \quad (5)$$

$$\omega_j = \frac{g_j}{\sum_{j=1}^n g_j} \quad (6)$$

⑤ Comprehensive level value:

$$U_i = \sum_{j=1}^n \omega_j \times x_{ij}, (i = 1, 2, 3, \dots, m) \quad (7)$$

U_i is the itemized livelihood capital of households. ω_j is the weight of livelihood capital indicators. x_{ij} is the standardized value of individual livelihood indicators, $n=5$.

Obstacle Model

The barrier degree model helps to identify the constraints on the sustainable livelihood of households. The specific calculation steps are as follows:

① Determine the effect degree of single index on the overall goal T_j :

$$T_j = W_j \times U_{ij} \quad (8)$$

W_j represents the weight of the j -th criterion layer and U_{ij} represents the weight of the i -th single index of the j -th criterion layer.

② Determine the obstacle degree O_{ij} of single index i to sustainable livelihood

$$O_{ij} = \frac{T_j \times E_j}{\sum_{j=1}^n T_j \times E_j} \quad (9)$$

$$E_j = 1 - x_{ij} \quad (10)$$

O_{ij} said that the larger the value, the greater the barrier effect of this indicator.

③ Calculate the obstacle degree R_{ij} of each criterion layer

$$R_{ij} = \sum O_{ij} \quad (11)$$

Data Source

The data in this article come from the household survey data from October 2021. The participatory rural assessment method is used, supplemented by semi-structured interviews, to obtain first-hand data. A total of 255 peasant households were surveyed and interviewed, and discussions were held with relevant government personnel and village leaders. The survey content mainly includes the basic information of the rural households in the statistical sample area, the changes in the perceived capital of the respondents of the rural households under the influence of rural tourism, and the five items of livelihood capital.

RESULTS AND DISCUSSION

Analysis of households' livelihood characteristics

In order to understand the research on the livelihood characteristics of the three types of households, all data were standardized using the min-max standardization method. Then, the entropy method is used to comprehensively evaluate the livelihood capital level of the four types of households. The overall level of subsistence capital of the three types of households is ranked as follows: tourism-dominant type (2.857)>working-dominant type (2.646)>agricultural -dominant type (2.028).

As can be seen from Table 3, ①Human capital (H), the part-time job type is the highest (0.505), and the agricultural-dominant type is the lowest (0.388). The level of human capital is mainly limited by the influence of households' family structure and individual conditions. The agricultural-dominant type has the lowest level of human capital due to the fact that the highest education level of the adult labor force is low, and the average age of the adult labor force is older. The part-time households have the highest human capital, especially the education level of adults and their younger age are generally higher than those of other types of households. ②Natural capital (N), the agricultural-dominant type is the highest (0.474), and the balanced part-time type is the least (0.389). The agricultural-dominant type has the highest natural capital index, which is reflected in the absolute advantage in the area of cultivated land and forest land owned by households. The cultivated land, forest area, traffic and location around the households of balanced part-time households are significantly lower than those of other types of households, and the natural capital index is the lowest. ③Material capital (W), the tourism franchise type is the highest (0.685), followed by the agricultural-dominant type the lowest (0.545). Physical capital is affected by household living conditions and fixed assets. The area of tourism business houses and fixed assets are the key material production materials for households to participate in tourism development. Tourism franchise and balanced part-time households have increased assets, improved accommodation, more household appliances and locomotives, and higher material capital index; traditional households have low income, poor living conditions, and the lowest material index. ④ Financial capital (F), the tourism franchise type is the highest (0.656), and the agricultural-dominant type is the lowest (0.404). The income and savings of tourism-specialized households have increased, and tourism investment has continued to increase, especially the initial investment that requires renovation and the purchase of necessary facilities and supplies, with more loans and the highest financial capital index. Traditional households have the least income, plus their own households owe a lot of loans and have the lowest financial capital. ⑤Social capital, the social capital of the three types of households is at a low level, among which the tourism franchise type is the highest (0.396), and the agricultural-dominant type is the lowest (0.326). On the whole, households lack relatives and friends such as government departments, enterprises and institutions, and the social network connection is low. There are few social resources that can be used, and social capital is at a low level.

Table 3. Livelihood levels of different types of households

Types	Livelihood Composite Index	Human capital	Nature Capital	Material Capital	Financial Capital	Social Capital
Tourism-dominant type	2.671	0.480	0.453	0.685	0.656	0.396
Working-dominant type	2.471	0.550	0.389	0.665	0.493	0.374
Agricultural-dominant type	2.137	0.388	0.474	0.545	0.404	

Diagnosis of Factors Affecting the Livelihood of Households with Different Income Types

Analysis of Barrier Factors at the Criteria Level and Indicator Level of households' Sustainable Livelihoods

The obstacle degree model was used to calculate the obstacle degree of the livelihood capital of 255 households. It can be seen from Table 6 that the criterion layer factor obstacle degree index was ranked from high to low, social capital (24.56%), human capital (22.81%), financial capital (21.62%), Natural capital (17.51%), physical capital (13.50%); in terms of the indicator-level factor barrier index, the top 10 individual indicators of the barrier degree index are: online social media (S3), social network support (S1), whole family Cultivated land area (N1), whole family forest area (N2), age of adult labor force (H1), education level (H2), number of adult labor force (H3), credit channel (F4).

Table 4. Obstacle factors at the criterion layer and indicator layer for sustainable livelihoods of households

Criterion layer	Obstacle degree	Indicator layer	Obstacle degree	Indicator layer	Obstacle degree
Human capital	22.81%	S3	8.79%	H1	6.21%
Nature Capital	17.51%	S1	7.48%	H2	6.12%
Material Capital	13.50%	N1	7.34%	H3	6.04%
Financial Capital	21.62%	N2	7.14%	S2	5.73%
Social Capital	24.56%	F5	6.55%	F4	5.43%

Analysis of Obstacle Factors of Sustainable Livelihood of Different Types of Households

Obstacle Factors of Criterion Layer

Based on the evaluation results of households' livelihood capital, the obstacle degree model is used to diagnose the obstacle factors affecting households' livelihood capital. It can be seen from Table 6 that the quasi-measurement layer with the largest obstacle for the three types of households is social capital. The main obstacle layer of tourism-dominant type is social capital and human capital, and its obstacle degree is 24.56% and 22.81%. The barrier layers of working-dominated and agricultural-dominated households are social capital and financial capital, and their barrier degrees are 36.14%, 32.20%, 36.54%, and 24.05%, respectively.

Table 5. Obstacle factors at the criterion layer for sustainable livelihoods of different types of households

Types	Human capital	Nature Capital	Material Capital	Financial Capital	Social Capital
Tourism-dominant type	22.81%	17.51%	13.50%	21.62%	24.56%
Working-dominant type	9.24%	17.21%	5.21%	32.20%	36.14%
Agricultural-Dominated type	20.05%	7.12%	12.24%	24.05%	36.54%

Analysis of the Main Obstacle Factors

In the index layer, the obstacle factor of households' livelihood capital is calculated using the obstacle degree model and sorted in descending order of obstacle degree. It can be seen from Table 7 that in the indicator layer, the main obstacle factors of tourism-dominant type households are: Internet and social media (S3), social network support (S1), education level (H2), and credit channels (F4). The main obstacle factors for working-dominated type households are the Internet and social media (S3), household deposits (F2), credit channels (F4), social network support (S1) indicators and other indicators. The main obstacle factors for agricultural-dominated type households are online social media (S3), social network support (S1), family arrears (F3), and adult labor age (H1).

Table 6. Obstacle factors at the indicator layer for sustainable livelihoods of different types of households

Types	Obstacle diagnosis	Index Order			
		1	2	3	4
Tourism-dominant type	Obstacle Factor	S3	S1	H2	F4
	Obstacle Degree	22.98%	12.87%	9.49%	8.90%
Working-dominant type	Obstacle Factor	S3	F2	F4	S1
	Obstacle Degree	19.28%	17.41%	8.74%	8.35%
Agricultural-dominated type	Obstacle Factor	S3	S1	F3	H1
	Obstacle Degree	16.80%	16.12%	14.09%	8.10%

It is essential to enhance the social capital of households and expand social network connections. In China's rural society, good social relations and strong social support are important foundations for the survival and development of households. There is a need to strengthen the connection and cooperation between households, cooperatives, village collectives, cultural and tourism-related enterprises, and so on, to promote the exchange of tourism information. Policies are called to strengthen the connection between households and the outside world through social media, and to expand the social relations and social resources of households. Actively organize and carry out online and social media trading skills training to help households use the Internet and social media to start businesses or trade agricultural products.

Rural communities and organizations need more power in strengthening the cooperation between households and increasing the households' awareness of the consumption needs of the rural tourism market. Expansion of the sales channels of characteristic industries is urgent, especially in using the Internet platform to lead households to take a multi-mode marketing path in the development of hospitality projects such as catering and

accommodation. Villagers need encouragement to actively participate in tourism training to improve their service quality and professional skills.

Further financial support may expand the credit channels. The high initial investment in tourism, in the context of poverty alleviation, has limited participation in farm tourism. Although tourism development plays a positive role in increasing households' income, it is difficult for households who lack sufficient assets to participate. At present, the main obstacle of tourism-dominant type and tourism participation type are credit channels. Local governments need to speed up the implementation of preferential policies that are conducive to households' participation in rural tourism operations and increase financial support. Enterprises should actively participate in the development and construction of rural tourism and provide more social capital for the countryside. Policy banks should be encouraged to increase credit support for the construction of tourism poverty alleviation areas, and village banks and financing guarantee institutions should be established to reduce the difficulty of credit.

Rural tourism requires improved rural human capital and increased participation of rural households. Improving the education level of households' family members, attracting highly educated talents to return to their hometowns and guiding migrant workers to return to their hometowns to start businesses. Second, the deep integration of tourism and traditional agriculture has enhanced the sustainability of livelihoods. There is a synergistic development relationship between tourism and traditional agriculture. The current interaction between agriculture and tourism mainly focuses on the tourism utilization of agricultural products. Agricultural practices and associated cultural traditions can develop as attractions. Provide participatory activities with local agricultural and cultural traditions to enrich the visitor experience.

CONCLUSION

Starting from the dimension of livelihood capital and based on the analysis framework of sustainable livelihoods, this paper establishes the livelihood sustainability evaluation index system of households in tourism poverty alleviation areas. Based on the survey data on the livelihood of households in tourism poverty alleviation villages, the impact of rural tourism development on the sustainable development of livelihood in Wulingyuan tourism poverty alleviation area in Zhangjiajie under the background of rural revitalization strategy is studied. The specific research conclusions are as follows: First, the development of rural tourism has improved the original livelihood environment of households. Influenced by objective factors such as family structure, individual conditions, and external environment, households have formed three different types of livelihood.

Second, the development of rural tourism has generally improved the livelihood capital of households, but there are differences in the stock of livelihood capital of different types of households; the overall level of livelihood capital is sorted by size: tourism-dominant type > working-dominant type > agricultural-dominant type.

Third, tourism-dominated households scored the highest in physical capital, financial capital and social capital; part-time households scored the highest in human capital, and traditional households scored highest in natural capital.

Fourth, social capital is the biggest obstacle in common among the three types, and online social media is the common obstacle factor for the three types.

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