Research Article

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Research on the current situation of rural tourism in southern Fujian in China after the COVID-19 epidemic

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Abstract: The present study examines the impact of the tourism industry on rural development and ecological environment after the COVID-19 epidemic from the perspectives of different stakeholders, taking the rural villages of Fujian as an example. The study was conducted using a hybrid study method. 402 valid questionnaires were analyzed using SPSS 22.0 statistical software, statistical and *t*-test methods, and then the results of the interviews and field surveys were compiled, compared, and examined by multivariate verification. The results found that insufficient parking and recreation, bicycle lanes and commentary facilities, rising prices of land and houses, deteriorating community environment and air quality, inadequate police and security personnel and communication channels for the community, and low awareness of community service among residents have bothered the residents. The poor communication channels in the community, lack of manpower for infrastructure, bicycle lanes, sightseeing indicators, preferential measures, and police and security, poor water quality, and overflow of garbage make tourists feel bad. Different stakeholders have different views on the current development of local society, humanities, environment, and natural ecology.

Keywords: COVID-19, Minnan culture, village development, environmental, tourism sustainability

1 Introduction

The tourism industry is crucial to economies worldwide, and countries are endeavoring to develop their local characteristics and natural resources. Rural areas are therefore key to tourism development because of their distinctive characteristics, such as their industrial features; opportunities for marketing, human and natural resources, and the natural environment; and attractiveness as recreational areas [1]. Tourism is the most vibrant industry in the world [2], and appropriate planning can increase the number of tourists. The larger the number of tourists and the longer their stay duration, the higher is the value created [3].

The Minnan branch of the Chinese Han ethnic group has a total population of over 50 million. This population including Chinese population is mainly located in Fujian, Guangdong, Zhejiang, Taiwan, and other parts of Southeast Asia. These people have a unique culture, history, and architectural style [4]. Gukeng village is located in Xiamen, Fujian Province, China. Initially, the local agricultural industry was the main feature of the village, which contains more than 4,000 mu of fruit and forest land [5]. However, because of the decline in employment in the agricultural industry and the exodus of young people, the local agricultural industry has declined, and economic development is challenging [6]. The local government of Gukeng village has taken advantage of the local rural architecture, agricultural industry, and natural environment in this region [6,7]. The local government is supporting the cultivation of ornamental plants and the development of tourism-related aspects, such as log cabins, leisure farms, rural cuisine, leisure fishing, and fruit and vegetable picking activities, to enhance tourism for promoting local economic development [8]. Consequently, the number of tourists visiting

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Gukeng village has increased to 10,018,700 people, which represents an almost eight-fold increase, and tourism revenues have increased 37.35 times to US\$25266.7 million [9,10]. The aforementioned statistics indicate that the development of local tourism has effectively improved the rural economy and increased the population's income.

However, although tourism development supports village development and village communities welcome improvement measures, sound tourism policies require careful planning by decision makers, appropriate development-related decisions, and the assistance of relevant industry organizations [11] because tourism development requires well-developed tourism facilities, a high-quality village environment, and convenient transportation [12]. To continue to attract tourists and achieve sustainable development, planners must also maintain tourism resources, tourism attractiveness, and a safe tourism environment [12,13].

Nevertheless, management decisions are not always sound, and their effectiveness varies. These decisions can have positive and negative effects on the economy, community, and environment [14–16], which can hinder the sustainable development of rural areas. Therefore, a key challenge is to identify the shortcomings of development decisions, provide appropriate suggestions to limit these shortcomings, and ensure that decisions are aimed at sustainable development.

In addition, changes resulting from tourism development do not occur overnight, and achieving results takes time [12–15]. Moreover, identifying the defects in a decision requires considerable experience and observation. Although the decision-making process changes the environment, the effectiveness of this process can be evaluated on the basis of public experience [17,18] and the opinions of residents [19,20]. The goal of tourism policy development is to make decisions that meet the needs of tourists, provide services and transportation that facilitate daily life by using modern technology, and make effective use of media marketing tools to raise awareness and attract foreign visitors, thereby promoting consumption and revitalizing local economic development [21]. However, a gap between the effectiveness of tourism decision development and public demand can always be identified, with consumer expectations not being fully met. The effectiveness of tourism policy-making is best reflected by the responses of tourists [22]; therefore, the degree of difference is best revealed by the perceptions of tourists following their experiences [17,23]. Nonetheless, policy development is not limited to improving the overall environment and development status of rural communities. Local governments wish to attract more people to

spend money on tourism and promote qualitative changes to the local economy [18,19]. Moreover, tourists expect scenic areas to have sufficient characteristics, convenient facilities, and high-quality services [22]. However, the COVID-19 pandemic has caused the tourism industry to shrink considerably [11,24,25], and the government expects tourism policy development to not only revive the industry, promote local industrial development, create employment opportunities for villagers, and provide people with a suitable leisure travel environment but also promote ecological sustainability and achieve a level of sustainable development in which humans and nature can coexist [20–22]. Therefore, this article proposes a multifaceted approach that obtains the views of both the residents and tourists, finds a balance between their views, and adjusts the direction of development decisions to help rural tourism achieve sustainability [11,20–22].

Numerous rural development studies have addressed the issue of sustainable development after COVID-19 [24,25] and have explored government development decisions from the perspectives of residents [26], tourists [27], or both [11,20,22,28]. The present study analyzed the effectiveness of rural tourism decision-making in southern Fujian through the perceptions of local residents and tourists in Gukeng village in Tong'an, Xiamen, Fujian, China. Ultimately, we hope to help Gukeng village make more effective tourism decisions and provide suggestions for the future development of other villages in south Fujian, thereby filling a research gap related to post-COVID-19 rural tourism development.

In summary, tourism-related policies aim to solve the challenges in local development, and tourism development can enhance rural economies and benefit the local community and environment [1–3]. Although COVID-19 has affected the tourism sector considerably, tourism will be key to reactivating rural development in the post-pandemic period [29,30]. However, although China has gradually restarted its domestic tourism activities following its promotion of a universal COVID-19 vaccination policy [31], the tourism industry has not yet fully recovered [11,24,25] because the pandemic is still continuing worldwide. Therefore, the reopening of the tourism sector must be approached cautiously. Furthermore, the effectiveness of a policy must be judged over time [12–15,33,34], and balanced development policy planning can be achieved by considering the opinions of the residents and tourists [19–22]. Moreover, during the pandemic, little research has been conducted on the Minnan culture and rural areas in China. Therefore, the main purposes of this study were to understand sustainable development in the tourism industry in the Minnan region through case

studies and an examination of the local challenges and to conduct relevant research to fill gaps in the literature related to tourism in the post-pandemic period. We aimed to identify feasible options for fostering the sustainable development of the tourism industry in the Minnan region.

2 Theoretical framework

Because of the impact of the COVID-19 pandemic, people's freedom to travel has been restricted, and their willingness to visit other places has decreased, which has led to the collapse of the tourism industry worldwide [35]. However, although tourism policy-making can have negative effects, it can still promote economic and industrial development and improve community-related facilities and the living environment [15]. Therefore, rural tourism development can be explored through tourism impact theory, which can be discussed in terms of economic, social, and environmental factors.

2.1 Economic impact theory

The main objective of promoting tourism activities and development is to improve the local economy [14,36]; hence, economic impact theory is discussed first.

Tourism development has a beneficial effect on local economies [36] because it can attract visitors to localities, where they will spend money on activities, accommodation, and the purchase of goods and food, thereby bringing wealth to the local people [37]. However, COVID-19 has hindered the tourism industry considerably [35]. Therefore, whether tourism development will continue to have a beneficial effect on local economies after the pandemic should be discussed.

The impact on the economy can be studied from the perspectives of industry and infrastructure, consumer prices, and rural development [11,22]. It can also be assessed in terms of leisure opportunities, publicity, facilities and construction maintenance, funds for community development, medical facilities and sanitation, community communication channels, development and protection policies, policy participation opportunities, creative goods, land and housing prices, employment opportunities, and expenditure costs [20,25]. Therefore, we used the aforementioned themes as the basis of our study on the impact of tourism activities on rural economic development in the post-pandemic period.

2.2 Social impact theory

To develop tourism, local funds are usually invested in plans to establish facilities [18] and improve local tourism environment, which helps tourists spend money in a manner that is convenient and comfortable and indirectly enhances the existing living space of local residents [20].

In general, social impacts can be divided into societal and cultural impacts. Societal impacts refer to the changes in the lives of the community residents, and cultural impacts refer to the changes in the community arts and crafts. The aforementioned long-term changes result from tourism development [38]. However, scholars believe that social impact can be discussed in terms of community creation, living atmosphere, and cultural security [20,22], which include factors such as increasing tourism awareness, improving the quality of tourism activities, the commercialization of community buildings, participation in community tourism affairs, adequate tourism indicators, increased choice of recreational facilities, proactive community environments, the preservation of the indigenous culture, access to vocational training opportunities, improvements in the living environment, industry contributions to local development, youth development, tourist friendliness, development of traditional cultural activities, positive interactions with incoming residents, a sense of security, increased community self-governance, investment in indigenous cultural industries, willingness to revisit or purchase local property, and sufficient police and fire safety personnel [22,26,27]. Therefore, we used the aforementioned factors to study the impact of tourism activities on the development of rural society in the post-pandemic period.

2.3 Environmental impact theory

Environmental impacts, which are also known as physical environmental impacts, include changes in the natural and cultural environments [39]. The cultural environment includes the leisure environment and tourism facilities, which can be examined in terms of suitable transportation facilities, public transportation for tourism, well-managed bike paths, completed tourist trails, convenient bike rental, an extensive Wi-Fi network coverage, sufficient personal living space, environmental quality influenced by tourists, increased facility construction areas, and sufficient parking and rest facilities [20,22,23].

Although tourism development changes the local environment [22,39], it can usually be discussed in terms

of the natural landscape, ecology, and protection measures [11,18]. Related issues include air quality, pollution from motor vehicles, water quality, the destruction of native habitats, the overexploitation of vegetation and woodland, environmental literacy, active participation in nature conservation, the preservation of historical sites, clean community environments, and the absence of littering by tourists [22,26,27]. Therefore, we studied the impact of tourism activities on rural environmental development in the post-pandemic period from the aforementioned perspectives.

2.4 Analysis of literature on resident, tourist, and stakeholder cognition of impact of COVID-19 pandemic on tourism

Tourism is a temporary activity in which people leave their places of residence and work and visit predetermined tourist destinations [33]. Impacts refer to the changes, benefits, or conditions caused by an activity or related continuous events at different levels, and impacts are generated in a two-sided manner [34]. However, the pandemic and related infection risks have decreased people's willingness to travel and restricted their daily lives and activities [35]. Although promotional activities and commodities in rural areas and scenic spots can be used to attract more tourists [1–3] and benefit rural areas [29,30], the transmission risk of COVID-19 has affected people's willingness to participate in tourism activities because of their fear of infection in crowded places [11,24,25], which has resulted in a decline in tourism-related revenue. Therefore, we believe that exploring the development of rural tourism in the Minnan region in the post-pandemic period would help decision makers understand the effectiveness and challenges of rural tourism development and identify appropriate solutions.

Tourism impacts are the changes caused at locations because of tourism development, which are usually reflected in terms of economic, social, and environmental factors [15]. However, the positive and negative impacts of tourism development usually remain unnoticed at the time of tourism policy implementation [12–15]. Because numerous people have been living in their residence area for a long time, they can detect changes in their surroundings [19,20]. Thus, we believe that developing future tourism policies for rural areas through the views of local residents on current tourism development would help improve policy effectiveness.

However, some studies have indicated that residents have different expectations regarding the acceptance of

tourism industry development. Therefore, we believe that although residents can detect changes caused in their villages and natural environment by tourism development, their perceptions can differ. Therefore, we propose the following hypothesis (Hypothesis 1): residents have different views on the economic, social, and environmental impacts of rural tourism development. We hope to clarify the development dilemmas of local residents and offer suggestions for the development of future policies that gain their recognition.

Furthermore, the main purpose of developing tourism is to revitalize the local economy [35], and attracting people from outside the area to visit and spend money is key to achieving this purpose [36]. The richness and diversity of tourism resources in tourist destinations usually promote relaxation and knowledge enrichment [23,36]. Therefore, we believe that developing future tourism policies for rural areas by adopting the suggestions of tourists would help gain the recognition and trust of tourists and encourage more people to travel and spend money.

However, some studies have revealed that tourists have different perceptions of the effectiveness of tourism industry development. Thus, although visitors should have the same expectations of the changes brought about by local development, in reality, their perceptions differ. Therefore, we propose the following hypothesis (Hypothesis 2): tourists have different views on the economic, social, and environmental impacts of rural tourism development. We hope to clarify the development dilemmas of tourists and offer suggestions for future development policies that gain their recognition.

In addition, tourism policies are aimed primarily at improving local conditions, promoting economic development, and improving the living standards of residents [11]. They also aim to provide adequate tourism features, develop comprehensive and convenient facilities, improve the physical and mental health of tourists, and promote tourism consumption behavior for developing local business opportunities [13]. Therefore, the ultimate goal of tourism policies is to meet the needs of residents and visitors and achieve sustainable development by obtaining consensus from them [20–22]. Thus, we believe that creating future rural development policies based on the majority opinions of residents and tourists would gain their recognition and result in the achievement of sustainable development in rural tourism.

However, studies have indicated that village residents and visitors have different perceptions and expectations because of their different backgrounds and economic status and different needs for quality of life and material goods [11,13,22]. Consequently, we believe that although

tourism development is aimed at improving local conditions to meet the needs of the residents and tourists, these groups have different perceptions of development effectiveness because of the differences in their living environment and consumption levels. Therefore, we propose the following hypothesis (Hypothesis 3): residents and tourists have divergent opinions on the economic, social, and environmental impacts of rural tourism development. We hope to clarify the development dilemmas of tourists and residents and offer suggestions to policymakers on reasonable and balanced decisions and goals.

3 Methods and instruments

3.1 Study framework, design, and positioning

The study was conducted in Gukeng village, Tong'an, Xiamen, with local residents and tourists as the target population, to analyze the development effectiveness of tourism decisions in the Minnan rural area. First, we collected and reviewed tourism-impact-related studies [11–41] and then developed the main research framework based on the current situation of Gukeng village [5–10] in relation to various factors, such as economic [11,20,25], social [20,22,26,27], environmental [20,22,23], and ecological [20,26,27] factors. Three experts in the field of tourism and policy development were interviewed to prepare the first draft of the research questionnaire. A total of 100 questionnaires were distributed and collected for pretesting, and the reliability of the questionnaires was analyzed using SPSS 22.0 statistical software.

A total of 500 questionnaires were distributed on a website frequented by Gukeng villagers and other online platforms in May 2020. Of these questionnaires, 452 were recovered and 402 were valid; thus, the recovery rate was 88.9%. Results were obtained through a sequence of summarization, organization, and analysis [19]. Subsequently, by using a multivariate verification analysis method and combining the information from different research participants, theories, and methods, multiple types of data were verified from a range of viewpoints [42–44], and the results were compared [11–41] to obtain an in-depth understanding. Finally, field surveys and interviews were conducted to collect additional information, and after summarizing, organizing, and analyzing the data, a multivariate review was conducted. The effectiveness of local tourism development policies was examined in terms of resident and tourist perceptions of the impact on tourism development and the natural environment in Gukeng village. The research framework is presented in Figure 1.

Hypothesis 1. assumes that residents have the same perception of the impact of rural tourism on economic, social, and environmental developments and the natural environment in rural areas.

Although the pandemic has affected tourism industry development, scholars argue that policy development can still improve local conditions [12] and facilitate improvements in the local economic development and strengthen the communities and the environment [10–35] for the benefit of all the residents. Therefore, we argue that the economic, social, and environmental changes produced by local tourism development in rural areas should be experienced consistently by local residents.

Figure 1: Study framework.

Hypothesis 2. assumes that tourists have the same perception of the impact of rural tourism on economic, social, and environmental developments and the natural environment in rural areas.

Although the pandemic has limited tourism planning, scholars argue that tourism activities can still provide relaxation and consumption opportunities through the local natural environment, culture, and products [10–35]. Therefore, we believe that tourists are consistently sensitive to the impact of local tourism development on the current economic, social, and environmental situation in rural areas.

Hypothesis 3. assumes that different stakeholders have the same perception of the impact of rural tourism on economic, social, and environmental developments and the natural environment in rural areas.

Tourism development has been affected by the pandemic, which has reduced the frequency of activities and the number of tourists. However, studies have argued that the pandemic has not affected the expectations of residents that they can improve their livelihoods through tourism development [19,20], nor has it prevented tourists from relieving their current stress through participation in tourism activities [29,30]. However, residents and tourists have different views on the outcomes and needs of tourism activities [20–22]. Therefore, we argue that different stakeholders have different perceptions of the impact of tourism on the current economic, social, and environmental developments of rural areas.

3.2 Research tools

The dimensions and sub-dimensions of economic, social, and environmental developments and the natural environment were identified from tourism-impact-related literature [11–41]. To assess awareness, this study adopted a 5-point Likert scale ranging from 1 for “strongly disagree” to 5 for “strongly agree;” thus, the higher the score, the higher the awareness level (Table 1).

A reliability analysis examined whether the measurement tool was reliable and stable. The research questionnaire was analyzed with the alpha coefficient of confidence by using SPSS 22.0 software. The value of Cronbach’s α is between 0 and 1, and the larger the α value, the stronger is the correlation and the higher is the reliability [45]. In general, α values below 0.6, between 0.6 and 0.8, and greater

than 0.8 indicate that the internal consistency of the questionnaire is poor, strong, and very strong, respectively [46]. Analysis revealed that all the Cronbach’s α coefficients for awareness levels regarding economic, social, and environmental developments and the natural environment were greater than 0.8; thus, the reliability of the questionnaire at all levels of the study was high, and subsequent analysis could be conducted, as presented in Table 2.

A field survey and interview method was used to collect practical information based on the results of the questionnaire analysis, and all data were summarized, organized, and analyzed [41] and then examined through multivariate verification [42,44]. Details of the interview participants are summarized in Table 2.

4 Research limitations

The survey began in May 2020. In the initial stage, sample collection was restricted because of labor, material resource, and funding limitations as well as factors such as the farming period and the young population working outside the area. Furthermore, at that time, COVID-19 was not yet under control. Therefore, a large proportion of the collected information was obtained using online questionnaires. After analyzing the sample data through statistical validation, a field survey was conducted to observe the current status of village development and the opinions of the residents and tourists. However, because of differences in respondent cooperation and familiarity with 3C products, the collected information was flawed. The limitations of this study are discussed further in this article, and we hope that future studies address these limitations to improve the findings of this study.

4.1 Results and analysis

The most direct and objective insight into the impacts of tourism development can be obtained from the experiences of locals and tourists. However, due to human, material, and financial constraints and the epidemic, one can obtain reliable and objective answers if the total sample size is more than five times the total number of questions [47]. The study mainly targeted the residents and tourists of the Gukeng village. A total of 500 questionnaires were distributed and 452 questionnaires were collected, with 402 valid questionnaires and a recovery rate of 88.9%. SPSS 22.0 statistical software was used to

Table 1: Reliability analysis of economic, social, and environmental developments, and ecological dimensions

Issue		
Basic variables	Gender (male/female), identity (residents or tourists), age (under 20, 21–30, 31–40, 41–50, and over 51), marital status (married, unmarried, and other), education level (below junior high school, high school, university, and graduate school or above), occupation (student, service industry, public servant, manufacturing, and freelance or retirement), income (USD) (under 500, 501–1,000, 1,001–2,000, and over 2,001)	
Classification	Issue	Cronbach's α
Rural economic development		
Consumer prices	Increase in employment opportunities	0.900
	Increase in land and housing prices	0.903
	Higher expenditure costs	0.907
Industry establishment	Integration of local specialty industries	0.900
	Increase in tourism industry	0.899
	Increase in interpretation facilities	0.900
	Increase in leisure opportunities	0.899
	Promotion of sightseeing facilities	0.900
Village development	Increasing tourism infrastructure	0.900
	Complete maintenance of public facilities	0.901
	Improvement in the standard of medical and health care	0.901
	Establishment of community communication channels	0.902
	Development of protection policies	0.901
	Participation in tourism policy planning	0.901
Rural social development		
Community building	Development of creative products	0.902
	Increase in tourism awareness	0.917
	Improvement in the quality of tourism services	0.915
	Participation in community tourism affairs	0.916
	Proactive management of community environment	0.916
Atmosphere of daily life	Adequate tourism guidelines	0.916
	Increase in the selection of recreational facilities	0.916
	Youth development in the home village	0.918
	Contribution of industry to local development	0.915
	Improvement of living environment	0.916
Culture and security	Improvement in the quality of tourism activities	0.915
	Preservation of indigenous culture	0.916
	Development of traditional cultural activities	0.914
	Friendly to tourists	0.915
	Good interaction with new residents	0.915
	Investment in indigenous cultural industries	0.915
	Increase in community self-governance	0.915
	Adequate police, fire, and security personnel	0.917
	Feeling safe in daily life	0.915
	Willingness to revisit or purchase local property	0.916
Rural environmental development		
Conservation measures	Cleaning of the community environment	0.928
	No littering by visitors	0.929
	Adequate preservation of historical monuments	0.928
	Active participation in nature conservation	0.928
	Public awareness of environmental literacy	0.928
Tourism facilities	Comprehensive sightseeing trails	0.927
	Well-managed bike paths	0.927
	Public transportation to facilitate tourism	0.928
	Extensive Wi-Fi network coverage	0.928
	Cheap bike rental	0.928
Leisure environment	Excellent transportation facilities	0.928
	Increase in facility construction area	0.928

(Continued)

Table 1: Continued

Classification	Issue	Cronbach's α
Rural ecological environment	Sufficient parking and resting facilities	0.927
	Environment quality is affected by tourists	0.929
	Sufficient individual living space	0.928
	Good quality drinking water	0.928
	Good air quality	0.926
	Overexploitation of vegetation and woodland	0.927
	Destruction of native habitats	0.929
	Pollution from motor vehicle fumes	0.929
	Good water quality	0.931

analyze the questionnaires by basic statistical tests and *t*-tests, and then the results of the interviews and field surveys were compared, and the data were finally compiled and examined by multivariate verification.

4.2 Analysis of background variables

The analysis showed that the proportion of residents in the sample was high (69.7%) compared to the tourists (30.3%), and the gender was mostly female (75.9%) than male (24.1%). People in the age range of 21–30 years old were the majority at 67.2%, whereas 51–60 years old, as well as 60 years old and above, were the least at 1.7%, while people under 20 years old were at 20.4%, 31–40 years old were at 6.7% and 41–50 years old were at 2.2%. As for the marital status, majority of them (61%) were unmarried, and about 9% of them were divorced. The largest proportion of them

had college degrees (39%), and the smallest proportion of them had master's degrees or above (11%). The largest proportion of them were students (30%) and smallest proportion of them had jobs in manufacturing sector companies (15%). The largest proportion of them earned less than \$500 a month (35%), and the smallest proportion of them earned more than \$2,001 a month (10%) (Table 3).

4.3 Analysis of resident perception of economic, social, and environmental developments, and ecological impacts in rural areas

The results of the local impact of tourism development require time to substantiate [12–15]. The most authentic differences in policy effectiveness can be reflected from the residents' perspectives and perceptions [19,20]. A

Table 2: Background information of the interviewees and outline of the interview

Identity	Gender	Age or working qualifications	Identity	Gender	Age or working qualifications
Professor	Male	40	Residents	Male	40
Professor	Female	25	Tourists	Female	45
Professor	Male	15	Tourists	Male	35
Residents	Female	46	Tourists	Male	40
Residents	Female	20			
Construct	Issues				
Impact of tourism development	1. What is the impact of tourism decision-making on the current economic situation in rural areas? What is the main reason for the change? 2. What is the impact of tourism decision-making on the current social situation in rural areas? What is the main reason for the change? 3. What is the impact of tourism decision-making on the current environmental conditions in rural areas? What is the main reason for the change? 4. What is the impact of tourism decision-making on the current ecological environment in rural areas? What is the main reason for the change?				

statistical examination was conducted to analyze residents' perception of economic, social, and environmental developments, and ecological impacts in rural areas. It was found that residents perceived that tourism decisions had the highest degree of effectiveness in increasing employment opportunities (3.98), increasing tourism facilities (3.91), and developing creative goods (4.00), while the lowest degree of effectiveness was in increasing land and housing prices (3.74), increasing interpretive facilities (3.77), and establishing community communication channels (3.83), in terms of rural economic development. Thus, residents believed that the tourism decision created more jobs, increased tourism construction, and developed creative goods, but also led to an increase in land and housing prices, and in reality, interpretation facilities and community communication channels remained insufficient.

In terms of rural social development, improving the living environment (4.00), increasing the choice of recreational facilities (3.95), and developing traditional cultural activities (3.91) were the most effective, while sufficient police and fire security personnel (3.66), youth returning to their hometowns for development (3.81), and actively cleaning up the community environment (3.85) were the least effective. It showed that residents believed that tourism decisions would help improve the rural living environment, increase recreational facilities, and develop traditional cultural activities, but police and fire safety personnel were still insufficient, residents were not active in organizing the community environment, and youths' willingness to return to their hometowns was low.

Regarding the development of the rural environment, the highest perceptions were for the active participation in nature conservation (3.94), extensive Wi-Fi network coverage (3.93), and increased facility construction area (3.94), while the lowest perceptions were for adequate parking and resting facilities (3.80), well-managed bicycle paths (3.81), and clean community environment (3.88). Therefore, the residents felt that the tourism policy was acceptable, but the parking and resting facilities were insufficient, and the management of bike paths and the maintenance of the community environment should be strengthened.

In terms of ecological environment, respondents felt most strongly that the vegetation and woodlands were overdeveloped (3.91) and least strongly that the air quality was good (3.74). It showed that the residents believed that the decision to overexploit the local vegetation and woodland had affected the air quality.

The above analysis revealed that the results of the analysis of residents' perceptions of the impact of tourism decisions on rural economic, social, and environmental

developments, and ecological environment were not consistent with research Hypothesis 1 (Table 4).

4.4 Analysis of visitor perception of economic, social, and environmental developments, and ecological impacts in rural areas

Tourism policy-making should improve local tourism facilities and provide measures that meet the needs of tourists, increase consumer desire, and improve the local economy [21]. The actual effectiveness of policy-making is best reflected by the opinions of tourists after their experiences [22]. Therefore, we analyzed visitors' perception of economic, social, and environmental developments, and ecological impacts in rural areas by statistical examination. It was found that visitors perceived that rural economic development had the highest degree of change in terms of increasing employment opportunities (4.02), increasing leisure opportunities (3.89), and developing creative goods (3.95), and the lowest degree of change in establishing community communication channels (3.75),

Table 3: Demographic background analysis

Background		N	%
Right holder	Residents	280	69.7
	Tourists	122	30.3
Gender	Male	97	24.1
	Female	305	75.9
Age	Under 20	82	20.4
	21–30	270	67.2
	31–40	27	6.7
	41–50	9	2.2
	51–60	7	1.7
	Over 60	7	1.7
Marital status	Married	122	30
	Unmarried	245	61
	Other	35	9
Education level	Below junior high school	80	20
	High school	120	30
	University	156	39
	Graduate school	46	11
Occupation	Student	121	30
	Service industry	66	16
	Public servant	65	16
	Manufacturing	60	15
	Freelance or retirement	90	22
Income (USD)	Under 500	140	35
	501–1,000	138	34
	1,001–2,000	82	20
	Over 2,001	42	10

Table 4: Analysis of resident perception of economic, social, and environmental developments, and ecological impacts in rural areas

Sub-dimension	Issue	M	Rank
Rural economic development			
Consumer prices	Increase in employment opportunities	3.98	1
	Increase in land and housing prices	3.74	3
	Higher expenditure costs	3.79	2
Industry establishment	Integration of local specialty industries	3.82	5
	Increase in tourism industry	3.89	3
	Increase in interpretation facilities	3.77	6
	Increase in leisure opportunities	3.90	2
	Promotion of sightseeing facilities	3.86	4
Village development	Increasing tourism infrastructure	3.91	1
	Complete maintenance of public facilities	3.89	3
	Improvement in the standard of medical and health care	3.84	5
	Establishment of community communication channels	3.83	6
	Development of protection policies	3.87	4
	Participation in tourism policy planning	3.96	2
	Development of creative products	4.00	1
Rural social development			
Community building	Increase in tourism awareness	3.94	2
	Improvement in the quality of tourism services	3.91	3
	Participation in community tourism affairs	3.91	3
	Proactive management of community environment	3.85	5
	Adequate tourism guidelines	3.87	4
Atmosphere of daily life	Increase in the selection of recreational facilities	3.95	1
	Youth development in the home village	3.81	5
	Contribution of industry to local development	3.96	2
	Improvement of living environment	4.00	1
	Improvement in the quality of tourism activities	3.90	3
Culture and security	Preservation of indigenous culture	3.88	4
	Development of traditional cultural activities	3.91	1
	Friendly to tourists	3.83	3
	Good interaction with new residents	3.83	3
	Investment in indigenous cultural industries	3.83	3
	Increase in community self-governance	3.85	2
	Adequate police, fire, and security personnel	3.66	5
	Feeling safe in daily life	3.83	3
Rural environmental development	Willingness to revisit or purchase local property	3.77	4
	Conservation measures		
	Cleaning of the community environment	3.88	4
	No littering by visitors	3.73	5
	Adequate preservation of historical monuments	3.91	3
	Active participation in nature conservation	3.94	1
	Public awareness of environmental literacy	3.92	2
	Tourism facilities		
	Comprehensive sightseeing trails	3.86	3
	Well-managed bike paths	3.81	6
	Public transportation to facilitate tourism	3.89	2
	Extensive Wi-Fi network coverage	3.93	1
	Cheap bike rental	3.84	5
	Excellent transportation facilities	3.85	4
	Leisure environment		
	Increase in facility construction area	3.94	1
	Sufficient parking and resting facilities	3.80	4
	Environment quality is affected by tourists	3.90	2
	Sufficient individual living space	3.88	3
Recreational environment			
	Good quality drinking water	3.89	2

(Continued)

Table 4: *Continued*

Sub-dimension	Issue	<i>M</i>	Rank
	Good air quality	3.74	6
	Overexploitation of vegetation and woodland	3.91	1
	Destruction of native habitats	3.85	4
	Pollution from motor vehicle fumes	3.88	3
	Good water quality	3.80	5

preferential tourism facilities (3.66), and increasing expenditure costs (3.69). Based on the findings, tourists believed that tourism policies promoted the development of creative goods and increased rural employment and leisure opportunities, but local prices were low and community communication channels and tourist facility concessions were insufficient.

In terms of social development of rural villages, the highest perceptions were for raising tourism perception (3.86), preserving indigenous culture (3.97), and investing in indigenous cultural industries (3.95), while the lowest perceptions were for sufficient police and fire security personnel (3.59), youth returning to their hometowns for development (3.61), and sufficient tourism indicators (3.65). According to the survey, tourists believed that the development of tourism policy would help the village to enhance its tourism popularity and protect indigenous culture and related industries, but the tourism indicator and police and fire security personnel were insufficient, and youths' willingness to return to their hometown was low.

In terms of environmental development in the village, the highest perceptions were that the participation in nature conservation is active (4.02), public transportation is helpful to tourism (3.93), and there is enough space for personal life (3.90), while the lowest perceptions were that the area of facility construction has increased (3.72), bike paths are well managed (3.70), and no littering by tourists (3.76). Therefore, tourists believed that the development of tourism policy had increased the enthusiasm of tourists to participate in nature conservation, public transportation had improved the convenience of scenic spots, and the quality of life had gradually improved, but the infrastructure construction and bike path planning were still insufficient, and tourists' littering behavior was common.

In terms of ecological environment, visitors felt most strongly that the vegetation and woodland were overdeveloped (3.89) and least strongly that the water quality was good (3.50). This showed that tourists thought that tourism decisions had led to overexploitation of vegetation and woodland and that the quality of water sources had become gradually unstable.

The above analysis revealed that the findings of the analysis of visitor perception of economic, social, and environmental developments, and ecological impacts in rural areas were inconsistent with research Hypothesis 2 (Table 5).

4.5 Analysis of the perception of economic, social, and environmental developments, and ecological impacts in rural areas among different stakeholders

In addition to reviving the tourism industry, promoting industrial development, opening up entrepreneurial opportunities, and providing a proper leisure environment, tourism policies are also expected to promote ecological sustainability and achieve the goal of sustainable development in which humans and nature coexist [20–22]. By obtaining the perceptions of both the residents and the tourists from multiple perspectives, a balance can be found and the direction of development decisions can be adjusted to help the village move toward sustainable development [11,20–22]. The results of the *t*-test analysis showed that there was no difference between the perceptions of different stakeholders on the economic development of rural areas ($p > 0.05$), indicating that there was a consistency in the perceptions of different stakeholders on the degree of change in the economic development.

Regarding the development of rural society, there were significant differences ($p > 0.05$) in the perceptions of youth returning to their hometowns for development (3.81:3.61), improving the living environment (4.00:3.73), investing in indigenous cultural industries (3.83:3.95), and willingness to revisit or purchase the local property (3.77:3.86), while other perceptions were consistent. This showed that different stakeholders had different views on the issues of youth returning to their hometowns, improving the living environment, investing in indigenous cultural industries, and the willingness to revisit or purchase the local property.

Regarding the development of the rural environment, significant differences ($p > 0.05$) were found in the

Table 5: Analysis of visitor perception of economic, social, and environmental developments, and ecological impacts in rural areas

Sub-dimension	Issue	<i>M</i>	Rank
Rural economic development			
Consumer prices	Increase in employment opportunities	4.02	1
	Increase in land and housing prices	3.70	2
	Higher expenditure costs	3.69	3
Industry establishment	Integration of local specialty industries	3.80	4
	Increase in tourism industry	3.83	3
	Increase in interpretation facilities	3.73	2
	Increase in leisure opportunities	3.89	1
	Promotion of sightseeing facilities	3.66	6
Village development	Increasing tourism infrastructure	3.84	2
	Complete maintenance of public facilities	3.86	2
	Improvement in the standard of medical and health care	3.84	3
	Establishment of community communication channels	3.64	6
	Development of protection policies	3.75	5
	Participation in tourism policy planning	3.80	4
	Development of creative products	3.95	1
Rural social development			
Community building	Increase in tourism awareness	3.86	1
	Improvement in the quality of tourism services	3.73	5
	Participation in community tourism affairs	3.83	3
	Proactive management of community environment	3.81	4
	Adequate tourism guidelines	3.65	6
Atmosphere of daily life	Increase in the selection of recreational facilities	3.84	2
	Youth development in the home village	3.61	5
	Contribution of industry to local development	3.78	3
	Improvement of living environment	3.73	4
	Improvement in the quality of tourism activities	3.89	2
Culture and security	Preservation of indigenous culture	3.97	1
	Development of traditional cultural activities	3.84	3
	Friendly to tourists	3.70	7
	Good interaction with new residents	3.75	5
	Investment in indigenous cultural industries	3.95	1
	Increase in community self-governance	3.73	6
	Adequate police, fire, and security personnel	3.59	8
	Feeling safe in daily life	3.79	4
Rural environmental development	Willingness to revisit or purchase local property	3.86	2
	Conservation measures		
	Cleaning of the community environment	3.90	3
	No littering by visitors	3.76	5
	Adequate preservation of historical monuments	4.01	2
	Active participation in nature conservation	4.02	1
	Public awareness of environmental literacy	3.89	4
	Tourism facilities		
	Comprehensive sightseeing trails	3.82	4
	Well-managed bike paths	3.70	6
	Public transportation to facilitate tourism	3.93	1
	Extensive Wi-Fi network coverage	3.89	2
	Cheap bike rental	3.77	5
	Excellent transportation facilities	3.87	3
	Leisure environment		
	Increase in facility construction area	3.72	4
	Sufficient parking and resting facilities	3.78	3
	Environment quality is affected by tourists	3.87	2
	Sufficient individual living space	3.90	1
Recreational environment			
	Good quality drinking water	3.80	2

(Continued)

Table 5: *Continued*

Sub-dimension	Issue	<i>M</i>	Rank
	Good air quality	3.73	4
	Overexploitation of vegetation and woodland	3.89	1
	Destruction of native habitats	3.73	4
	Pollution from motor vehicle fumes	3.77	3
	Good water quality	3.50	5

preservation of historical monuments (3.91:4.01) and public transportation for tourism (3.89:3.93), while other views were consistent. This showed that different stakeholders had different views on the preservation of historical monuments and public transportation for tourism.

Regarding the ecological environment, there was a significant difference ($p > 0.05$) concerning the good quality of water sources (3.80:3.50), while the other perceptions were consistent. This showed that different stakeholders had different views on the current situation of water quality.

In summary, the results of the analysis of the differences in the perceptions of economic, social, and environmental developments, and ecological impacts in rural areas by tourism decisions between different stakeholders were not consistent with Hypothesis 3 (Table 6).

5 Discussion

5.1 Resident perception of economic, social, and environmental developments, and ecological impacts in rural areas

Based on previous studies, it was found that after the intervention of tourism development in rural areas, residents had higher perceptions of improvements in local visibility, agro-industry management [1,22], employment opportunities, and health services [11,22], as well as public infrastructure [13], but did not consider them to be very helpful in other areas. In addition, support for tourism development varied with the duration of development [20,22].

The present study found that the local government has actively shaped the characteristics and attractiveness of Minnan rural tourism by organizing unique festivals and planting bougainvillea landscapes in addition to the distinctive features of Minnan rural villages and their thousands of years of history and cultural customs [48]. In addition, the improvement of external transportation,

enhancement of the Internet, and the integration of tourism, catering, accommodation, and entertainment industries have enhanced the quality of tourism experience and services [49]. However, due to the extensive rural hinterland, the construction industry is gaining a lot of revenue, the surrounding agricultural and forestry land is being exploited, and the surrounding environmental conditions are gradually changing. The aging of the existing population and the out-migration of highly educated young people have led to a shortage of manpower for local tourism services and for police and fire safety. The influx of tourists and the increase in demand for tourist consumption have caused the local land and housing prices to rise. Air quality is also affected by the popularity of motorcycles and the explosion of tourist traffic. The combination of these factors does not help to increase the desire of young people to return to their home towns.

As a result, residents believe that tourism policies can increase leisure, recreation and basic tourism facilities, improve Wi-Fi network coverage, develop traditional cultural activities and creative products, create employment opportunities, increase participation in nature conservation, and improve the living environment in rural areas. However, in reality, parking and resting facilities, community communication channels, and police and fire safety personnel are still insufficient. Residents' awareness of community environment maintenance is not high, bike path management and community environment maintenance need to be strengthened, and local vegetation and woodland are overexploited. As a result, the price of land and housing has risen, the air quality has been affected, and the desire of young people to return to their hometowns is low. The combination of the above reasons led to a different result from previous studies.

Therefore, the researcher believes that by improving the parking and interpretation facilities, establishing community communication channels, eliminating the shortage of police and fire safety personnel, strengthening the management of bike lanes, enhancing the quality of community environmental maintenance, stabilizing land and housing prices, improving air quality, and raising awareness of

Table 6: Analysis of the perception of economic, social, and environmental developments, and ecological impacts in rural areas among different stakeholders

Sub-dimension	Issue	Tourists	Residents	<i>p</i>
Rural economic development				
Consumer prices	Increase in employment opportunities	3.98	4.02	0.663
	Increase in land and housing prices	3.74	3.70	0.189
	Higher expenditure costs	3.79	3.69	0.723
Industry establishment	Integration of local specialty industries	3.82	3.80	0.461
	Increase in tourism industry	3.89	3.83	0.747
	Increase in interpretation facilities	3.77	3.73	0.982
	Increase in leisure opportunities	3.90	3.89	0.989
	Promotion of sightseeing facilities	3.86	3.66	0.517
Village development	Increasing tourism infrastructure	3.91	3.84	0.184
	Complete maintenance of public facilities	3.89	3.86	0.272
	Improvement in the standard of medical and health care	3.84	3.84	0.863
	Establishment of community communication channels	3.83	3.64	0.196
	Development of protection policies	3.87	3.75	0.209
	Participation in tourism policy planning	3.96	3.80	0.144
	Development of creative products	4.00	3.95	0.524
Rural social development				
Community building	Increase in tourism awareness	3.94	3.86	0.909
	Improvement in the quality of tourism services	3.91	3.73	0.330
	Participation in community tourism affairs	3.91	3.83	0.058
	Proactive management of community environment	3.85	3.81	0.110
	Adequate tourism guidelines	3.87	3.65	0.625
	Increase in the selection of recreational facilities	3.95	3.84	0.367
Atmosphere of daily life	Youth development in the home village	3.81	3.61	0.008*
	Contribution of industry to local development	3.96	3.78	0.908
	Improvement of living environment	4.00	3.73	0.003*
	Improvement in the quality of tourism activities	3.90	3.89	0.377
	Preservation of indigenous culture	3.88	3.97	0.058
Culture and security	Development of traditional cultural activities	3.91	3.84	0.856
	Friendly to tourists	3.83	3.70	0.916
	Good interaction with new residents	3.83	3.75	0.846
	Investment in indigenous cultural industries	3.83	3.95	0.001*
	Increase in community self-governance	3.85	3.73	0.814
	Adequate police, fire, and security personnel	3.66	3.59	0.479
	Feeling safe in daily life	3.83	3.79	0.724
	Willingness to revisit or purchase local property	3.77	3.86	0.000*
Rural environmental development				
Conservation measures	Cleaning of the community environment	3.88	3.90	0.105
	No littering by visitors	3.73	3.76	0.082
	Adequate preservation of historical monuments	3.91	4.01	0.005*
	Active participation in nature conservation	3.94	4.02	0.506
	Public awareness of environmental literacy	3.92	3.89	0.685
Tourism facilities	Comprehensive sightseeing trails	3.86	3.82	0.973
	Well-managed bike paths	3.81	3.70	0.841
	Public transportation to facilitate tourism	3.89	3.93	0.005*
	Extensive Wi-Fi network coverage	3.93	3.89	0.645
	Cheap bike rental	3.84	3.77	0.639
Leisure environment	Excellent transportation facilities	3.85	3.87	0.188
	Increase in facility construction area	3.94	3.72	0.343
	Sufficient parking and resting facilities	3.80	3.78	0.209
	Environment quality is affected by tourists	3.90	3.87	0.627
	Sufficient individual living space	3.88	3.90	0.105
Recreational environment				
	Good quality drinking water	3.89	3.80	0.567
	Good air quality	3.74	3.73	0.425

(Continued)

Table 6: *Continued*

Sub-dimension	Issue	Tourists	Residents	<i>p</i>
	Overexploitation of vegetation and woodland	3.91	3.89	0.100
	Destruction of native habitats	3.85	3.73	0.729
	Pollution from motor vehicle fumes	3.88	3.77	0.722
	Good water quality	3.80	3.50	0.014*

Note: * $p < 0.05$.

community environmental maintenance, the expectations of the residents may be met. In addition, it is recommended that parking spaces be properly planned, smooth communication channels with local villagers be set up, security management and development manpower be supplemented, price stability be maintained, and residents' willingness to cooperate with the government be improved when other tourism development policy is made for the locality or other Minnan villages after the end of the pandemic, so as to speed up the recovery of tourism industry and restore the economy of rural areas, as shown in Figure 2.

5.2 Visitor perception of economic, social, and environmental developments, and ecological impacts in rural areas

Based on the results of previous studies, it was found that tourists felt higher about the enhancement of cultural and historical characteristics, natural ecological resources characteristics [10,11,22], and cultural and creative products and leisure facilities [13] in rural villages as a result of tourism development, while they did not think the changes in other aspects were significant.

The study found that the local government first built the infrastructure for transportation and cultivated the bougainvillea forest [49], and then used established cultural and

customary festivals [50] to connect various industries to form a local tourism identity [51]. In order to effectively enhance the popularity of local tourism, improve economic benefits, and bring profits to residents, the importance of maintaining local resources has been emphasized. Nevertheless, although rural facilities and consumer goods are inexpensive and the surrounding agricultural and forest land is extensive, a large amount of agricultural and forest land has been opened up for tourism development. Although tourism industry construction around tourist areas has increased, there is still a lack of basic tourism public facilities and parking space. The outdated facilities in the villages and the lack of tourism indications have caused inconvenience to tourists. Various leisure facilities or industries are eager to gain revenue, and the price of the related products is too high. There is a large population of elderly people and a slight shortage of young people, which affects the manpower allocation for police and fire safety as well as tourism. The number of tourists has increased greatly, but their environmental literacy varies, and tourism waste has increased dramatically. The above problems affect the willingness of non-local youth to revisit or pursue development here.

As a result, tourists believe that tourism policies are effective in raising tourism awareness, preserving indigenous cultures and related industries, promoting the development of creative goods, enhancing the convenience of scenic spots through public transportation, increasing rural employment

Figure 2: Resident perception of economic, social, and environmental developments, and ecological impacts in rural areas.

and leisure opportunities, boosting people's enthusiasm for participating in nature conservation, and gradually improving the quality of life. Although commodity prices are low, community communication channels and tourism indications are not set up, facilities concessions are insufficient, infrastructure construction and bike path planning are still inadequate, the police and fire safety personnel are lacking, vegetation and forest land are overexploited, water quality is becoming unstable, tourists litter frequently, and young people have a low desire to revisit or return to their hometowns. The combination of the above reasons led to different results from previous studies.

Therefore, the researcher believes that increasing community communication channels and tourism indicators, planning tourism facilities and incentives, improving tourism infrastructure and bicycle paths, increasing police and fire security manpower, improving the quality of domestic water, and controlling tourists' littering behavior may further improve tourists' satisfaction. In addition, it is recommended that smooth and clear communication channels and indicators be set up, tourism security management and control measures be improved, traffic flow for tourists be controlled effectively, and sanitary facilities and clean water be provided, when other tourism development policy is made for the locality or other Minnan villages after the end of the pandemic, so as to win tourists' favor, as shown in Figure 3.

5.3 The perception of economic, social, and environmental developments, and ecological impacts in rural areas among different stakeholders

Based on previous studies, it was found that although tourism development has improved the local difficulties, different stakeholders have different perceptions on the

effectiveness of the construction and maintenance of public facilities, parking lot planning, citizens' commitment to construction [11], high industry similarity, lack of human resources [13], the level of medical care, and tourism-oriented measures [22].

Rural villages are lagging behind in development, and they all expect to improve the development of local industries and their difficulties through policy-making [20]. Residents expect industrial development and entrepreneurial opportunities to be restored [21], tourists expect a proper leisure environment for tourism purposes [11], and the government expects to promote ecological sustainability to achieve the goal of sustainable development where humans and nature coexist [11,20–22]. However, the needs of residents and tourists are contradictory, as residents of the to-be-developed areas expect a leap and improvement in the quality of life [18,19], while tourists expect the traditional culture and the native ecological environment to be preserved for the pleasure of tourism [16,23,52]. In fact, there are differences in the demand and recognition of policy-making between the two [11,20], resulting in different views on rural society, environmental development, and the ecological environment from different stakeholders.

There is a difference in development between rural and urban areas. Although the tourism policy has significantly improved the quality of life in the rural areas and the economic development of the residents, the residents would like to have more manpower to improve the existing tourism industry and economic development. As a result, residents feel more strongly about youth returning to their hometowns to develop, improving the living environment, and better water quality.

The rural area with special cultural customs, coupled with festivals and bougainvillea ecological scenery, has become a rich and appealing tourist attraction [46–48]. The road widening and the interlinked public

Figure 3: Visitor perception of economic, social, and environmental developments, and ecological impacts in rural areas.

Figure 4: The perception of economic, social, and environmental developments, and ecological impacts in rural areas among different stakeholders.

transportation planning by the government have greatly enhanced the convenience of tourists and increased their willingness to visit. Therefore, tourists are more likely to experience the changes in indigenous cultural industries, preservation of historical monuments, and public transportation to enhance tourism convenience, and are more likely to revisit or purchase the property. The combination of the above reasons led to different results from previous studies.

Therefore, a consensus among different stakeholders should be reached based on the different needs of residents and tourists on issues such as living environment, cultural industries, preservation of monuments, public transportation, and water quality. Preserving the original forest ecology and enhancing the attractiveness for people to revisit or return to the home village for development may improve the policy-making. In addition, it is recommended that existing culture, environment, historical sites, and water quality be protected, and their characteristics be used properly to plan promotional activities for attracting tourists, when other tourism development policy is made for the locality or other Minnan villages after the end of the pandemic, so as to satisfy the needs of residents and tourists, as shown in Figure 4.

6 Conclusion and suggestion

The study found that the development of the tourism industry and activities has indeed helped improve the infrastructure and wireless network coverage in Minnan rural areas, increase the number of traditional cultural activities, creative products, and employment opportunities, and promote public participation in the local environmental conservation work. Moreover, the increase in

popularity has prompted enterprises to invest in leisure facilities and develop creative products, increased entrepreneurial opportunities and facilitated the development of local cultural industries, improve the quality of public transportation services and tourism experience, and increase the public's awareness of local natural environment conservation and willingness to travel there. However, the development has led to the increase in housing and commodity prices in the locality, shortage of parking space, entertainment, and tourism facilities, insufficient manpower for security and environmental sanitation maintenance, and decline in environmental maintenance quality. As a result, the residents and tourists have different views on the local development.

In general, having been limited by insufficient funds, manpower, and material resources, the scope of the case study was narrowed within Gukeng village in Fujian Province, China, and the study results are not applicable to the current situation of rural areas in other regions and countries. However, tourism planning has indeed benefited the economic, social, environmental, and ecological developments of Minnan rural areas. On the other hand, economic growth has led to an increase in the cost of living and travel, insufficient manpower for security and environmental sanitation maintenance, lack of entertainment facilities, explanation boards, and parking space, so the needs of tourism development have not been satisfied. The influx of tourists has occupied the space for the daily life and leisure activities of local residents, and destroyed the existing environment. Eventually, it will cause local residents trouble, increase the negative perception of tourists, and hinder the sustainable development of Minnan rural areas.

Based on the above, the research recommendations are as follows.

1. For government departments or decision makers

Tourism development is not only about investing or building tourist attractions but also about improving the quality of the overall services and planning in order to provide tourists with convenient tourism solutions and increase their satisfaction and willingness to consume. Therefore, it is suggested that the local government should build parking spaces on its own or in cooperation with local landowners, control the quality of water sources, preserve some agricultural and forest landscapes, set up garbage bins in scenic areas, promote environmental literacy among tourists, and carry out industry-academic cooperation with neighboring schools to provide internship or employment opportunities to complement the elementary manpower for tourism, which should help mitigate the problem.

2. For residents

Tourism development is not the responsibility of the government alone. The tourist area is also the living area of the residents, and it is important to have the concept of coexistence and co-prosperity. Therefore, it is suggested that the residents can organize an autonomous association to actively maintain the living environment around them, and recruit local elders to cultivate young cultural interpreters or artisans to preserve the characteristics of unique cultural and historical resources, which should help increase the attractiveness of local tourism.

3. For tourists

Visitors expect a high-quality tourist environment and scenery. However, it is everyone's responsibility to maintain the tourism environment, and tourists must also possess high environmental literacy and take action to maintain the environment of the scenic spots as well. Therefore, it is recommended to use eco-friendly tableware when consuming, minimize the production of travel waste, and put the waste in the garbage cans or collect the waste for later disposal, which will help to improve the problem of garbage overflow.

4. Suggestions for future research

Because the study was only aimed to discuss the policy and planning of tourism development in Minnan rural areas in the post-pandemic period, coupled with the limited funding, manpower, and time, only cultural cases in the area have been discussed, and SPSS 22.0 statistical software was used to analyze the limited data that has been collected. Therefore, it is recommended that the relevant research on other folk cultures or ethnic groups can be carried out. Other statistical software such as AMOS and AHP, SEM, or regression analysis can be

used for analysis and verification. Topics such as tourism risks, environmental literacy, personal epidemic prevention, and physical and mental health can be discussed. All of these will be conducive to the formulation of sustainable development policies for rural areas and tourism industries after the pandemic.

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