



RETRACTED: Research on Rural Revitalization and Governance From the Perspective of Sustainable Development

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The Chinese government has long attached great importance to rural revitalization. The harmony and stability in rural areas are the fundamental guarantees of rural sustainable economic growth and farmers' prosperity, and they rely on effective rural governance. Taking the Fu'an City in Fujian Province of China as an example, this paper analyzes the rural governance problems arising from the implementation of the rural revitalization strategy with the method of dynamic games with incomplete information after data collection by on-the-spot investigation and file inquiry, etc. The results show that the "solicitation" behavior of village B to increase its own income does not maximize the income of village B and village N; Even under the optimal state of income distribution is derived through the game model, the income distribution between the two villages is still unfair to village N, the investor of the "Waterlands Resort". Therefore, in order to solve the rural governance problems caused by the distribution of benefits between village B and village N, government subsidies, property rights protection, village rules and regulations are required. Besides, the leading role of rural grassroots organizations should be given full play, and villagers' self-governing system needs to be improved.

Keywords: rural revitalization, rural governance, game theory, sustainable economic growth, green environment

1 INTRODUCTION

Rural governance is a rural reform strategy that combines top-down macro-management of rural areas by the modern state and bottom-up self-transformation by traditional villages (Gao and Wu, 2017). It plays an important role in maintaining rural stability and social harmony. Since the beginning of modern times, major developed countries have formed a pattern of firstly pursuing industrialization and urbanization at the expense of the development of rural areas, and then conducting rural reconstruction or rural governance through the top-level design to gradually achieve rural integration, rural interaction, urban-rural integration and eventually rural revitalization. For example, the East Asian rural governance models, including the "Village Making Movement" in Japan and the "New Village Movement" in South Korea, aim at narrowing the gap between urban and rural areas and revitalizing rural development. The Western European rural governance models, including the village renewal in Germany,

agricultural land consolidation in the Netherlands, rural construction in Switzerland, and rural reform in France, focus more on the ecological environment, landscape protection, and cultural conditions in the countryside; The North American rural governance models, represented by small rural town construction in the United States and the Rural Partnership in Canada, mainly advocate urban-rural integration and pursue balanced economic and political development in the countryside (Yang et al., 2021). The above-mentioned rural governance models have proven to be effective in raising farmers' income, improving their quality of life, narrowing the urban-rural gap, and promoting modern rural development.

The rural revitalization strategy in China has planned a new order of rural governance, and a well-functioning rural governance system can effectively promote the modernization of the national governance system (Kosec and Wantchekon, 2020; Song et al., 2022a). The Chinese government requests the general requirements for the implementation of the rural revitalization strategy are "prosperous industry, ecological livability, rural civilization, effective governance, and affluent life". Among them, "effective governance" plays a pivotal role as a guarantee element to promote rural revitalization. Accelerating the modernization of the rural governance system and governance ability is the only way to realize rural revitalization. At present, all regions and departments should take rural governance as the key to rural revitalization and effectively improve the effectiveness of rural governance to contribute to realizing rural revitalization.

This paper, taking the Fu'an City in Fujian Province as an example, deeply analyzes the rural governance problems arising from the implementation of the rural revitalization strategy with the method of dynamic games with incomplete information through data collection by on-the-spot investigation and file inquiry, etc. and proposes countermeasures and suggestions according to local conditions. This study is significant for solving similar rural governance problems in China.

The rest of this paper is organized as follows: Chapter 2 is literature review, Chapter 3 presents research problems, Chapter 4 presents the analysis of these problems by the dynamic games with incomplete information and the findings, Chapter 5 provides countermeasures and suggestions, Chapter 6 is the conclusion.

2 LITERATURE REVIEW

As industrialization and globalization continue to advance, different types of rural areas have emerged around the world (Liu et al., 2020). With the promotion of rural governance and the stimulation of reverse urbanization, some rural areas have achieved economic development and improved people's living standards (Lowe and Ward, 2007; Zhao et al., 2022a); However, there are also some rural areas that have fallen into the dilemma of economic decline and environmental degradation (Liu and Li, 2017; Yurui et al., 2019). How to achieve sustainable rural development is a problem faced by both developing and developed countries (Qin et al., 2020; Song et al., 2022b). The United States, the representative in promoting the integration of urban and rural development, enacted the Rural Electrification

Act in 1936, officially initiating the implementation of the rural development policy system in the United States. The implementation of the Rural Electrification Act accelerated the electrification process in rural areas of the United States, effectively increased farmers' income and promoted the establishment of an integrated model of urban-rural coexistence (Keck, 1985). The German government launched the Digital Strategy 2025 in 2016 to guide social capital to participate in rural Internet construction and alleviate the imbalance of Internet development between urban and rural areas (Li, 2018; Zhao et al., 2022b). Russia, as an emerging economy, has made active efforts to improve the rural development environment. It issued the Development of Agriculture and Regulation of Agriculture Commodities Markets in 2013–2020 to provide financial support and financial subsidies to rural enterprises, and agricultural banks, etc., which plays an important role in increasing the income of farmers and promote economic development in rural areas (Efremova et al., 2017; Song et al., 2020).

Scholars have studied rural governance in other countries, mainly focusing on two aspects. The first aspect is the significance and aspiration of rural governance models in developed countries. Wang et al. (2008) explored the rural construction in South Korea, the United States and Japan, and summarized the experience from which China can learn, including the strong advocacy and promotion of the government to develop regionalized, specialized and industrialized agriculture and train new farmers. Huang et al. (2014) summarized the experience of new rural community construction in Germany, South Korea and Japan, and put forward policy recommendations for China in terms of the concept and subject of rural construction, infrastructure, ecological environment, and local culture. Qi (2018) analyzed the new rural construction in Japan, the United States and Europe, and concluded that rural construction in China should implement the principle that infrastructure goes first, emphasize culture inheritance and promote advanced planning and management models. The second aspect is the classic cases of rural governance in developed countries and regions. For example, Zhang et al. (2007), Shao (2019) studied the background, implementation methods, and actual effectiveness of the "One Village, One Product" movement in Japan; Ren, (2006), Sonn and Gimm (2013), Shao (2019) studied the socio-economic background, specific measures, achievements and problems of the "New Village Movement" in South Korea; Luo and Liu, (2014); Wang and Jiang (2008) explored the aspiration for rural construction in China from the rural reform in France, village renewal in Britain, the small town development in the United States, rural construction in Canada, rural construction and agricultural policy adjustment in Sweden, respectively.

The above-mentioned research helps China to understand rural construction in other countries. However, these studies are mainly general introductions and experience summaries. Comparative analysis of the classical rural governance models in developed counties is rare despite that some studies have analyzed the characteristics of rural governance models in different countries. Besides, studies focusing on proposing

rural governance models with Chinese characteristics based on the actual rural governance situation in China and the gap between China and western developed countries is lacking.

With the comprehensive promotion of China's rural revitalization strategy, researchers around the world have studied rural governance in China and proposed a series of constructive suggestions for effective rural governance (Gao et al., 2020; Yurui et al., 2021). Tang (2022), Jing (2021) proposed that the basic-level party organizations play an essential role in the organization and leadership of rural governance, and the leading role of basic-level party organizations is fundamental to the smooth progress of rural governance. Therefore, the basic-level party organizations should unite and adhere to the routes, principles and policies of the CPC to optimize the rural governance. Liu et al. (2020) suggested that the Chinese government clearly defines the new goal of rural development in the new era. In this context, rural governance should adopt the development mechanism of urban-rural integration to promote rural modernization so that a better living and development environment for rural people can be guaranteed. Wang and Zhuo (2018) proposed that rural governance is the key to realizing rural revitalization. In order to effectively improve the effectiveness of rural governance, the valuable experience in the current rural governance practices should be summarized in a timely manner, and rural governance should be conducted according to local conditions. Guo (2020) suggested that basic-level administrative organizations in China have realized the critical role of rural governance in rural construction and have started rural governance. However, little effect has been achieved. Therefore, how to effectively carry out rural governance has become one of the critical issues in current academic circles. It was further proposed that related organizations should conduct rural governance based on the actual condition of rural development and a definite aim, taking the fundamental interests of the rural masses as the starting point to achieve remarkable results. Freeman, (2004) studied the impact of a series of reform measures in the countryside by CPC on the rural economy, society, and farmers from the perspectives of politics, history, and sociology. It can be seen that social and administrative governance issues are the focus of research on rural governance in China and Promoting the transformation of the rural governance model is to realize the rural revitalization at an early date.

In terms of the research method, this study adopts dynamic games with incomplete information to investigate the rural governance problems during the implementation of the rural revitalization strategy in Fu'an city. Therefore, here, the application of this method is summarized. Yang et al. (2018) constructed a resident-developer evolutionary game model based on the evolutionary game theory to study the evolution of cooperation paths between the two parties during rural tourism resource development. It was found that, within a certain range, increasing the cooperation profit factor, increasing the government subsidy, increasing the penalty for contract breach, and reducing the cooperation risk will help the two parties reach a consensus and establish a cooperative relationship rapidly. Zuo (2016) demonstrated that the

repeated bargaining among government, business, and people in a non-cooperative game with incomplete information inevitably leads to the cooperative game and its ethical implications. The Nash equilibrium solution that maximizes both social welfare and individual benefits was deduced. Besides, the applicability of the model framework and the dynamic changes of the solution caused by the relative scarcity of resources, changes in the bargaining power of the involved parties and their different risk preferences were further discussed. Ge and Jiang (2021) constructed an evolutionary game model consisting of three parties, namely, financial regulators, rural financial institutions and rural economic entities, to address the imbalance between supply and demand of rural financial services and investigated the evolution paths of strategies of related parties in the game under different scenarios and the influence of key factors on the equilibrium state of the system using numerical simulation methods. Yang (2016) analyzed the contradictions among the government, villagers and developers according to the game theory in economics and argued that stakeholders should be more involved in the development of rural tourism while strengthening their environmental awareness to ensure sustainable development. Chen and Wang (2017) constructed a principal-agent model of central government and local government and an evolutionary game model of government and polluting enterprises based on the revenue function of micro subjects, and simulated the game relationship among the three subjects, from which a reasonable design mechanism of environmental tax collection was derived.

The above studies help to understand the game theory. However, most of them focus on the interest game among different types of subjects, including government, enterprise and residents. Studies on the interest game between the same type of subjects (e.g., the game between villages or between villagers) are rare. This study theoretically explains the actual state of tourism revenue distribution among villages of the same level based on social welfare maximization and Pareto optimality by the dynamic game with incomplete information. Besides, in this paper, the equilibrium solution of social welfare and individual revenue maximization and Pareto optimality is obtained through the derivation of the game model to explain where the conflict between village B and village N lies.

3 RESEARCH QUESTIONS

Village B and village N are located in the southeast coastal area of Fu'an City, Fujian Province, China. Its geographical location is close to the mountains and faces the sea, and has rich marine resources. Since 2018, Village N has corrected the extensive development and blind expansion of the aquaculture industry in the previous years following the requirements of Fu'an City for "comprehensive cleaning, standardized breeding, and compliance with regulations." It promoted the comprehensive correction of marine aquaculture, transformed and upgraded all the original 3,000 aquaculture fish rafts into the new plastic cage. It actively guided fishermen to utilize the sea scientifically, use the sea according to the law, and standardize aquaculture. A series of measures have significantly improved the

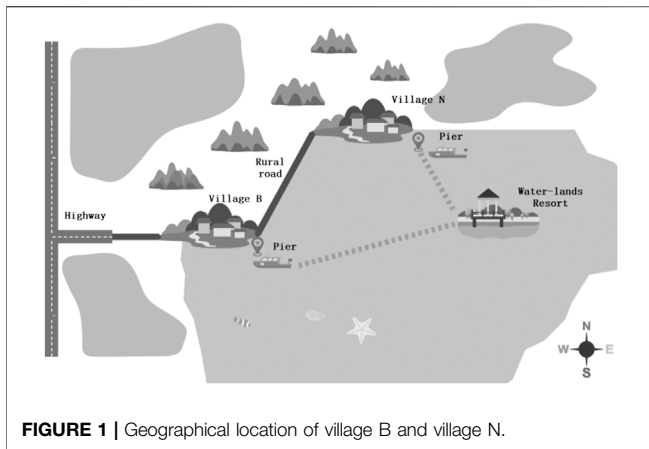


FIGURE 1 | Geographical location of village B and village N.

coastal ecological environment and natural landscape. At the same time, based on carrying out the task of marine breeding transformation, village N started the fishing and tourism project of “waterlands resort and colorful fishing village.” The construction of “Waterlands Resort” scenic spots, house facade transformation, and other measures realized the synchronous planning and construction of industrial development and fishing village construction. It also combined leisure fishing and tourism with the traditional breeding industry, driving villagers to increase income and become rich. At the same time, because village B is the neighbor of village N, and the distance between the two villages is close, village B has also been included in the “waterlands resort and colorful fishing village” fishing and tourism project. The house facade has also been reconstructed, but village B has not participated in the investment and construction of “Waterlands Resort” scenic spots, so there is a contradiction between village B and village N in rural tourism development. Village B has its geographical advantages (Figure 1). That is to say, if tourists go to village N, they need to go through the geographical advantage of village B to “solicit tourists” and provide tourists with a series of tourism services such as tour guide, boat, catering, and so on. As a result, the number of tourists to village N is significantly reduced, which leads to the decline of village N’s rural tourism revenue. Therefore, the competition between the two villages is actually the competition between the two villages in the rural tourism market. Based on the incomplete information dynamic game, this paper makes an in-depth analysis of the “rural tourism market competition” between village B and village N in the process of implementing the rural revitalization strategy in Fu’an city. It also proposes solutions and suggestions for its rural governance according to the research conclusions.

4 DYNAMIC GAME WITH INCOMPLETE INFORMATION

4.1 The Basic Hypothesis of the Game Between Village B and Village N

Assuming that village B acts before village N and enters the market based on its geographical advantages and “free-riding” behavior, village B may be a village with the “first-mover

advantage” or a village without the “first-mover advantage.” Assuming that village B has the first-mover advantage, its cost function is as follows:

$$C(q_1) = q_1$$

Where $C(\bullet)$ is the cost function of village B, which is the function of the number of tourists q_1 in village B.

When Village B has no first-mover advantage, its cost function is as follows:

$$C(q_1) = 2q_1$$

There is no uncertainty in the cost function of Village N, and its cost function is as follows:

$$C(q_2) = 2q_2$$

Where $C(\bullet)$ is the cost function of village N, which is the function of the number of tourists q_2 in village N.

The cost function of village N is the same as that of village B. As the “Waterlands Resort” scenic spot is built by village N, village N needs to pay an additional fixed cost to move into the market, making its size six. In addition, the demand function of rural tourism is assumed to be:

$$P = 10 - Q$$

P is the price of rural tourism; Q is the number of tourists in rural tourism market, and $Q = q_1 + q_2$.

There is a sequence of actions in village B and village N - village B takes the lead and enters the market, and village N enters the market after, therefore the game is dynamic. At the same time, village B and village N have a clear understanding of the cost function of village N. However, village B may be a village with the “first-mover advantage” or a village without the “first-mover advantage.” Village B clearly understands its own cost function, but village N does not. That is to say, there is incomplete information. Therefore, the game is dynamic with incomplete information.

4.2 Game Process

Because village B has the advantages of geographical location and “free-riding” behavior and it takes the lead to enter the market, village B can make two strategies of “soliciting customers” and “not soliciting customers.” in which L means “not soliciting customers,” R means “soliciting customers.” At the same time, village N lags behind village B because of its inferior geographical location. However, village N can make two strategies: “forbidding village B to use scenic spots” and “allowing village B to use scenic spots” because village N invests in the construction of “Waterlands Resort” scenic spots alone. In the game, U means “allowing village B to use scenic spots,” and V means “forbidding village B to use scenic spots.” In addition, Village N, which acted later, did not know the strategy choice of village B and only had a priori belief about village B. Village N thinks that the probability of selecting strategy L for B village is p , and the probability of choosing strategy R is $1-p$. Consequently, in choosing different strategies, the incomplete information dynamic game matrix and extended-expression form of “rural tourism market competition” between village B and village N are shown in Figures 2 and 3.

		Village N	
		Strategy U	Strategy V
Village B	Strategy L	(L, U)	(L, V)
	Strategy R	(R, U)	(R, V)

FIGURE 2 | Dynamic game matrix with incomplete information.

Because village B acts first, village B can be regarded as a monopolist when choosing the number of tourists. If village N chooses the strategy “allowing village B to use scenic spots,” then village B and Village N will play an oligopoly game in the rural tourism market. It is assumed that the oligopoly game follows the Cournot model (Shen, 2010).

4.2.1 Village B Has the “First-Mover Advantage”

When Village B has the “first-mover advantage.” Its cost function is $C(q_1) = q_1$ and village B’s is $C(q_2) = 2q_2$. When Village B chooses strategy L or R, and village N chooses strategy U, namely strategy (L, U) and strategy (R, U), the two villages play Cournot oligopoly game in the rural tourism market.

When two villages choose a strategy (L, U), the profit function of village B is as follows:

$$\pi(q_1) = Pq_1 - C(q_1) = (10 - q_1 - q_2)q_1 - q_1$$

In the Cournot oligopoly game, village B regards the number of tourists q_2 of village N as a given value and maximizes its profit by choosing its number of tourists q_1 :

$$\frac{\partial \pi(q_1)}{\partial q_1} = 0$$

After organizing the above formula, we can get the following results:

$$2q_1 + q_2 = 9$$

The profit function of village N is as follows:

$$\pi(q_2) = Pq_2 - C(q_2) - 6 = (10 - q_1 - q_2)q_2 - 2q_2 - 6$$

In the Cournot oligopoly game, village N regards the number of tourists q_1 of B village as a given value and maximizes its profit by choosing its number of tourists q_2 :

$$\frac{\partial \pi(q_2)}{\partial q_2} = 0$$

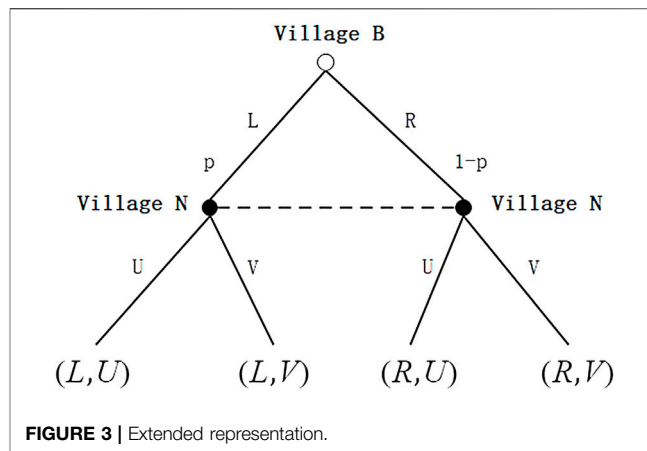
After organizing the above formula, we can get the following results:

$$q_1 + 2q_2 = 8$$

The simultaneous equations of q_1 and q_2 are thus established:

$$\begin{cases} 2q_1 + q_2 = 9 \\ q_1 + 2q_2 = 8 \end{cases}$$

The results are as follows:



Therefore, under strategy (L, U), the profits of village B and village N are as follows, respectively:

$$\begin{cases} q_1 = \frac{10}{3} \\ q_2 = \frac{7}{3} \end{cases}$$

$$\begin{aligned} \pi(q_1) &= \frac{100}{9} \\ \pi(q_2) &= -\frac{5}{9} \end{aligned}$$

When village B and village N are under strategy (R, U), the number of tourists in village N decreases because village B implements strategy R. Assuming that the number of tourists in village N decreases by one unit, the profits of village B and village N under strategy (R, U) are as follows:

$$\begin{aligned} \pi(q_1) &= \frac{100}{9} \\ \pi(q_2) &= -\frac{14}{9} \end{aligned}$$

In addition, when village N chooses strategy V, no matter village B chooses strategy L or strategy R, namely strategy (L, V) and strategy (R, V), village N becomes the sole monopolist of “Waterlands Resort” scenic spots and monopolizes its rural tourism market. Therefore, the profits of village B and village N under strategy (L, V) and strategy (R, V) are as follows:

$$\begin{aligned} \pi(q_1) &= 0 \\ \pi(q_2) &= 10 \end{aligned}$$

Therefore, when village B “has the first-mover advantage,” the dynamic game matrix and extended-expression of incomplete information of “rural tourism market competition” between village B and village N are shown in **Figures 4** and **5**.

4.2.2 Village B Has “No First-Mover Advantage”

Under the condition of “no first-mover advantage,” the cost function of village B is $C(q_1) = 2q_1$, and the cost function of

		Village N	
		Strategy U	Strategy V
Village B	Strategy L	$(\frac{100}{9}, -\frac{5}{9})$	$(0, 10)$
	Strategy R	$(\frac{100}{9}, -\frac{14}{9})$	$(0, 10)$

FIGURE 4 | Dynamic game matrix of incomplete information when village B “has the first-mover advantage”.

village N is $C(q_2) = 2q_2$. When village B chooses strategy L or strategy R, and village N chooses strategy U, namely strategy (L, U) and strategy (R, U). The two villages play the Cournot oligopoly game in the rural tourism market, and the cost function is the same.

When two villages choose a strategy (L, U), the profit function of village B is as follows:

$$\pi(q_1) = Pq_1 - C(q_1) = (10 - q_1 - q_2)q_1 - 2q_1$$

In the Cournot oligopoly game, village B regards the number of tourists q_2 of village N as a given value and maximizes its profit by choosing its number of tourists q_1 :

$$\frac{\partial \pi(q_1)}{\partial q_1} = 0$$

After organizing the above formula, we can get the following results:

$$2q_1 + q_2 = 8$$

The profit function of village N is as follows:

$$\pi(q_2) = Pq_2 - C(q_2) - 6 = (10 - q_1 - q_2)q_2 - 2q_2 - 6$$

In the Cournot oligopoly game, village N regards the number of tourists q_1 of village B as a given value and maximizes its profit by choosing its number of tourists q_2 :

$$\frac{\partial \pi(q_2)}{\partial q_2} = 0$$

After organizing the above formula, we can get the following results:

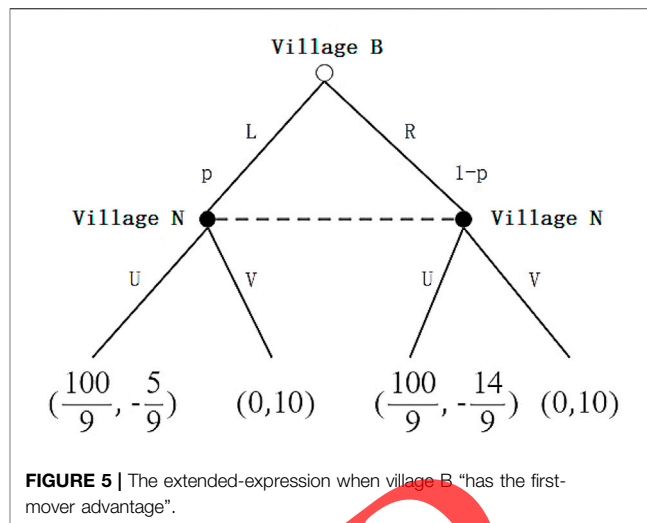
$$q_1 + 2q_2 = 8$$

The following simultaneous equations of q_1 and q_2 are established:

$$\begin{cases} 2q_1 + q_2 = 8 \\ q_1 + 2q_2 = 8 \end{cases}$$

The results are as follows:

$$\begin{cases} q_1 = \frac{8}{3} \\ q_2 = \frac{8}{3} \end{cases}$$



Therefore, under strategy (L, U), the profits of village B and village N are as follows, respectively:

$$\begin{aligned} \pi(q_1) &= \frac{64}{9} \\ \pi(q_2) &= \frac{10}{9} \end{aligned}$$

When village B and village N are under strategy (R, U), the number of tourists in village N decreases because village B implements strategy R. Assuming that the number of tourists in village N decreases by one unit, the profits of village B and village N under strategy (R, U) are as follows:

$$\begin{aligned} \pi(q_1) &= \frac{64}{9} \\ \pi(q_2) &= \frac{1}{9} \end{aligned}$$

In addition, when village N chooses strategy V, no matter village B chooses strategy L or strategy R, namely strategy (L, V) and strategy (R, V), village N becomes the sole monopolist of “ocean garden” scenic spots and monopolizes its rural tourism market. Therefore, the profits of village B and village N under strategy (L, V) and strategy (R, V) are as follows:

$$\begin{aligned} \pi(q_1) &= 0 \\ \pi(q_2) &= 10 \end{aligned}$$

Therefore, when village B “has no first-mover advantage,” the dynamic game matrix and extended-expression of incomplete information of “rural tourism market competition” between village B and village N are shown in **Figures 6** and **7**.

In a word, if village B has the “first-mover advantage” and village N chooses to “allow village B to use scenic spots.” The profit of village N will be negative when the two villages compete in the Cournot oligopoly in the rural tourism market. Suppose village B has “no first-mover advantage,” and village N chooses to “allow village B to use scenic spots.” In that case, the profit of village N is positive when the two villages compete in the Cournot

		Village N	
		Strategy U	Strategy V
Village B	Strategy L	$(\frac{64}{9}, \frac{10}{9})$	$(0, 10)$
	Strategy R	$(\frac{64}{9}, \frac{1}{9})$	$(0, 10)$

FIGURE 6 | Incomplete information dynamic game matrix of village B with “no first-mover advantage”.

oligopoly in the rural tourism market. In other words, when village B “has the first-mover advantage,” village N will choose to “forbid village B to use scenic spots.” When village B “has no first-mover advantage,” village N can choose two strategies: “forbidding village B to use scenic spots” or “allowing village B to use scenic spots.”

4.2.3 Further Discussion

According to the field investigation, village B is more inclined to “no first-mover advantage” for the following reasons. First, village N can quickly implement the operation after village B. Although village B has the advantage of geographical location, the distance between the two villages is relatively close. The villagers of the two villages communicate with each other frequently, so the speed of information acquisition is fast. After the operation of village B, village N can quickly enter the market. Second, village N can implement the strategy of “forbidding village B to use scenic spots.” Village B has the advantage of geographical location, and it can move ahead of village N and enter the market. However, because village N invests in the construction of “Waterlands Resort” scenic spots, village N can make two strategies: “forbidding village B to use scenic spots” and “allowing village B to use scenic spots.” Suppose village N makes the strategy of “forbidding village B to use scenic spots.” In that case, even if village B has an excellent geographical advantage, village N is still the sole monopolist of the “Waterlands Resort” scenic spots. In contrast, village B cannot use “Waterlands Resort” scenic spots to increase income. Therefore, the author uses the situation of “no first-mover advantage” of village B to study the incomplete information dynamic game of “rural tourism market competition” between the two villages.

4.3 Conclusion

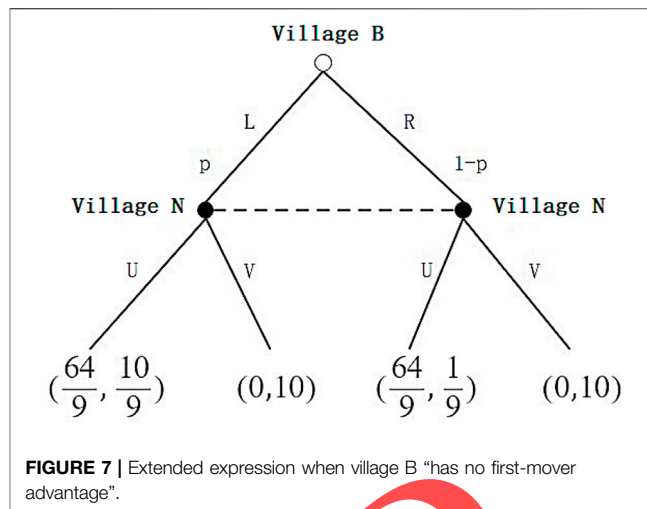
In Figure 7, because village N does not know whether village B chooses strategy L or strategy R, the two nodes of village N are in one information set. Suppose that village N has a priori belief, and it predicts that the probability of selecting strategy L for village B is p , the probability of choosing strategy R is $1-p$.

According to the priori belief of village N, the expected return of strategy U is as follows:

$$p \times \frac{10}{9} + (1 - p) \times \frac{1}{9} = \frac{1}{9} + p$$

The expected benefits of strategy V are as follows:

$$p \times 10 + (1 - p) \times 10 = 10$$



It can be seen that for any $0 \leq p \leq 1$, the income of village N choosing strategy V is higher than that of U. Therefore, village N will choose strategy V from its interests. In that way, village B anticipated the selection logic of village N. Regardless of its choice of strategy L or strategy R, it would not be able to use the “Waterlands Resort” scenic spots, and thus it would not be able to gain profits.

However, according to the field investigation, village B is more inclined to choose strategy U for the following reasons. The first reason is the cost of “forbidding village B to use scenic spots” is high and impractical. The “Waterlands Resort” scenic spot is a combination of leisure fishery and traditional breeding industry. It is built with more than 3,000 new plastic net boxes, forming a large-scale marine fishing and tourism complex project. It covers a large area and will continue to expand to a large extent in the future. In addition, the “Waterlands Resort” scenic spot can be used as a simple wharf for berthing ships. It is challenging for village N to judge whether the fishing boats moored are the village’s fishing boats, so it also dramatically increases the cost and difficulty of “forbidding village B to use scenic spots.” The second reason is to maintain the friendly relationship between the two villages. Village B and village N have maintained a good “neighborhood” relationship for many years, and the villagers have frequent contact with each other. Based on the traditional rural cultural ideas of “distant relatives are not as good as close neighbors” and “sharing happiness,” village N will choose strategy U to a large extent. If it chooses strategy V, it may damage its good long-term relationship with village B. The third reason is to realize rural revitalization better. Since 2013, all regions and departments across China have conscientiously implemented the strategic decisions and deployments of targeted poverty alleviation and rural revitalization, carried out the construction of beautiful villages in an orderly manner, and strived to achieve the general requirements of the rural revitalization of “prosperous industry, livable ecology, civilized rural style, effective governance, and affluent life.” Village B and village N also responded positively. In accordance with the requirements of Fu’an City’s marine aquaculture “comprehensive cleaning, standardized breeding and regulation,” Village N promoted the marine cleaning and upgrading, guided

the fishermen to use the sea scientifically, standardized breeding, and established “Waterlands Resort” scenic spots. It completely reversed the once disordered situation of marine aquaculture. Although village B did not invest in the construction of its scenic spots, due to its geographical advantages, village B and village N were jointly included in the fishing and tourism project of “Waterlands Resort and colorful fishing village” in Fu’an City. At the same time, they were transformed into pilot villages to promote rural revitalization and increase villagers’ income and realize shared prosperity. Therefore, according to the above analysis, village N is more inclined to choose strategy U, so the optimal choice of the game is the strategy (L, U), and its corresponding income is $(\frac{64}{9}, \frac{10}{9})$.

However, village B chooses strategy R (R, U), and the corresponding income is $(\frac{64}{9}, \frac{1}{9})$. Obviously, according to the above game results, strategy (R, U) is not optimal. In addition, to maintain a good relationship with village N, village B should choose strategy L rationally and stop the behavior of “soliciting tourists” to achieve the optimal income of the two villages.

However, strategy (L, U) cannot make village N satisfied. Village N believes that it has paid the cost of investing in the construction of “Waterlands Resort” scenic spots. Still, the benefits obtained are not as good as village B, which has not participated in the construction and investment of scenic spots. Therefore, the contradiction in the distribution of rural tourism income has become an urgent problem for the two villages.

In summary, the game model deduces that: 1. the “solicitation” behavior of village B to increase its own income does not maximize the income of the two villages; 2. Even the optimal state derived by the game model, the income distribution between the two villages is still unfair to village N, the investor of the “Waterlands Resort”. Therefore, how to stop village B from “soliciting” and solve the problem in tourism revenue distribution between the two villages is the focus of the next Chapter.

5 SOLUTIONS AND SUGGESTIONS

With the full roll-out of the rural revitalization strategy in China, the contradictions that affect villages’ harmony and shared prosperity at the same level gradually appear. Those contradictions are generally caused by the income of rural tourism between village B and village N. It often shows the characteristics of complexity. Therefore, in the context of rural revitalization, it is very challenging to solve such contradictions. Consequently, it is necessary to govern the villages effectively, regulate the inconsistencies among the villages at the same level, and establish a dynamic, harmonious, and orderly rural society to provide a harmonious and stable social environment for the full implementation of the rural revitalization strategy.

5.1 Giving Play to the Role of the Core Leadership of Rural Basic-Level Party Organizations

As the core of the leadership of rural society, rural basic-level party organizations play a vital role in rural governance. The rural grassroots party organizations should be strengthened, and their

leading core role should be given full play in the context of the implementation of the rural revitalization strategy. First of all, all villages need to strengthen the construction of rural basic-level party organizations, select excellent and strong village party organization secretaries, continue to rectify weak and lax village party organizations and ensure the leadership core position of the rural basic-level party organizations. Thirdly, the rural basic-level party organizations should play a leading role in rural social governance, be people-oriented, go deep into rural residents, and find the contradictions timely. Finally, the rural basic-level party organizations should take rural harmony as the starting point, take rural revitalization as the goal, and lead the township government and the villagers’ autonomous organizations to solve the contradiction through consultation based on the local reality. To solve the contradiction between village B and village N caused by the problem in tourism income distribution, the basic-level party organizations of the two villages need to lead the township governments and villagers’ self-governing organizations to negotiate and provide guidance and solutions when necessary. Meanwhile, they also need to adjust the solutions constantly in the process of guiding and leading the negotiation of tourism income distribution between the two villages, so that the solutions can be accepted by both sides. In this way, contradictions can be resolved at the grassroots level, so that a harmonious and stable rural society can be built.

5.2 Strengthening the Functions of Township Government

The township government is the most basic administrative organization in China. Therefore, the township government should change and strengthen its functions to provide an institutional, systemic and sustainable public service system for rural society, especially to establish a rural social service system oriented by the needs of rural residents, so as to meet better the aspirations and needs of rural residents for a better life. Besides, the government should appropriately streamline administration and delegate power, stimulate market vitality, let the market and society participate in rural social governance so that resources can be effectively allocated in rural social governance. However, in the face of market failure, the government should give full play to its governance function in time. For example, in the case of the contradiction between village B and village N, village N insists on taking the road of combining fishing with tourism with the dividend of rural revitalization policy and the opportunity of the comprehensive renovation and upgrading of marine aquaculture and integrates the colorful fishing village, fishery products, fishery culture and other resources while introducing attractive tourism projects. These activities not only increase the collective economic income of village N but also drive the collective economic income of neighboring village B. Besides, they protect marine resources and the marine landscape, reflecting robust positive externalities. Therefore, the township government should give adequate support to the village level projects with positive externalities, that is, to subsidize the fishing and tourism project of “Waterlands Resort, colorful fishing village” in terms of capital and technology, so as to ease the

dissatisfaction of village N villagers caused by the income distribution problem, and improve the enthusiasm of villagers to develop rural tourism and protect the ecological environment.

5.3 Adhering to a Rural Governance System That Combines Autonomy, the Rule of Law, and the Rule of Virtue

5.3.1 Establishing and Perfecting Villager Autonomy System

At present, as one of the basic-level mass autonomy systems, the villagers' self-governing system has become a basic political system of rural governance in China. Since the reform and opening up, villagers' autonomy aims to safeguard the fundamental interests of farmers, which has become the primary way of rural governance and plays a crucial role in rural reform and basic-level democratic political construction. Therefore, It should continue to deepen the practice of villagers' self-government, establish and improve the democratic system of villagers' self-government organizations, guide the establishment of villagers' governing council, formulate village rules and regulations, establish a democratic decision-making mechanism in rural areas, strengthen the dominant position of farmers, and establish a villagers' governance mechanism of "villagers' decision, villagers' construction and villagers' management" in village affairs based on the common interests of the majority of the masses. We should also avoid the government taking all the village affairs and realize the villagers to participate in the management and supervision in the project planning and construction. At the same time, with the implementation of the village affairs open system, the villagers can supervise and evaluate the projects to be built, village renovation, and other village affairs closely related to the villagers. They can also discuss and solve the problems and contradictions in the implementation of the rural revitalization strategy. Accordingly, in the case of the contradiction between village B and village N, the villager autonomy system should call on the villagers to negotiate and work out a solution. Besides, the relevant village rules should be formulated to prohibit village B from "soliciting". Furthermore, the villagers' self-governing organization should also play its supervisory function to ensure that Village B does not engage in "solicitation" anymore.

5.3.2 Strengthening the Construction of the Rural Legal System

As a special code of conduct with universal binding force, laws, and regulations have their own credibility and persuasion in the complex rural areas. With the advancement of the construction of harmonious and safe villages, all townships should carry out in-depth publicity and education of the rural legal system, strengthen the construction of legal and cultural positions in rural areas, improve the rural public legal system, adhere to scientific legislation, strict law enforcement, fair justice, and law-abiding by all people. At the same time, all townships should actively develop laws and provide assistance to guide villagers to defend their rights in accordance with the law, raise their awareness of the law, cultivate their awareness of

consciously abiding by the law. They should also understand the law when it comes to problems, use the law to resolve conflicts and solve problems. Consequently, we can create a harmonious and stable rural legal system atmosphere. Therefore, in the contradiction between village B and village N, because village N has invested and constructed the "Waterlands Resort" scenic spot alone, village N can ensure its ownership of the scenic spot through legal channels, that is, a property right. Suppose village B needs to use the scenic spot to increase the income of its villagers. In that case, it should pay village N for the right to use the scenic spot of "Waterlands Resort," which can make the tourism resources reasonably allocated, improve the efficiency of using resources, and solve the contradiction between the two villages.

5.3.3 Improving the Level of Rural Moral Governance

All villages and towns should vigorously promote the construction of rural civilization, cultivate civilized rural customs and simple folk customs, improve the level of rural moral governance, and make moral governance play a more significant role in rural governance. First of all, we should establish and perfect village rules and regulations and give full play to their binding role. In the above cases, the two villages can jointly negotiate to establish village rules and regulations to prohibit village B from "soliciting tourists." Secondly, we should continue to carry out the actions of changing customs and carrying forward the new trend of the times, vigorously promote the construction of spiritual civilization in rural areas, carry out the activities of building civilized villages according to local conditions, carry forward the rural neighborhood culture, and create a harmonious and shared rural society among people and villages, so as to consolidate the stable and harmonious situation of rural areas. Therefore, adhering to the rural governance concept of co-construction and sharing, village B should share tourism resources with village N and establish a sharing linkage mechanism with village N in rural tourism publicity, infrastructure construction, and other aspects.

5.4 Strengthening the Construction of the Team of Rural Governance Personnel

The quality and ability of rural governance personnel directly affect the effect of rural governance. The contradiction between village B and village N needs to be solved by the staff of grassroots party organizations, and township government, and members of villagers' self-governing organizations, etc. If they are unqualified, the conflicts between the two villages cannot be resolved properly and comprehensively. Therefore, various measures should be actively taken to mobilize all forces that can be mobilized to strengthen the construction of rural governance personnel. First of all, the vocational training for the villagers should be supported so that they can become members of the villagers' self-governing organization with ideals, aspirations, culture, technology, love for the countryside. They can also operate and understand management and gradually become an effective force for rural governance and revitalization. Secondly, the construction of the team of rural cadres should be strengthened by selecting capable people as the secretaries of the rural party organizations, and the

training for the person in charge of the basic-level party organizations should be intensified. At the same time, effective policies and measures should be taken to encourage residing village cadres and college-graduate village officials to realize their values of life in the vast rural areas. In addition, the two-way linkage working mechanism between township level cadres and village level cadres should be established and improved, and young cadres should be selected to assume temporary posts for personal training and development at organizations at the village level. Thirdly, the positive role of rural sages in rural governance should be given full play. Rural sages have a certain influence and appeal in rural areas and have special abilities. Their potential to make rural governance more reasonable and effective should be fully tapped. Finally, all sectors of society should be mobilized to participate in rural governance. A long-term incentive mechanism should be established to attract enterprise elites and social celebrities to boost rural governance through donation, investment, and social services. In addition, the advantages and strength of social organizations should be used, such as the communist youth league, women's federation, trade unions, etc., to mobilize all forces that can be mobilized to participate and significantly improve the effectiveness of rural governance.

6 SUMMARY

Effective governance is the foundation for rural revitalization. Strengthening the effectiveness of rural governance and promoting the construction of harmonious countryside are the basic requirements for implementing the rural revitalization strategy. This paper theoretically explains the actual state of tourism income distribution between village B and village N in Fu'an city, Fujian province, China, by the dynamic game with incomplete information after data collection by on-the-spot investigation and file inquiry. The game model deduces that: 1) The "solicitation" behavior of village B to increase its own income does not maximize the income of the two villages; 2) Even under the optimal state derived by the game model, the income distribution between the two villages is still unfair to village N, the investor of the "Waterlands Resort". Therefore, how to stop village B from "soliciting" and solve the problem in tourism income distribution between the two villages are the priority and this study makes following suggestions: Firstly, the grassroots party organizations of the two villages should play their leading

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core role and organize the governments and their respective villagers' self-governing organizations to negotiate and resolve the dispute; Secondly, the township government should effectively support village projects with positive externalities, in other words, subsidize the fishing and tourism projects in Village N in terms of capital and technology, so as to alleviate the discontent of villagers in Village N caused by the distribution problem; Thirdly, village N can secure its ownership of the "Waterlands Resort" scenic site through legal means, and if village B needs to use this site to promote its income, it should pay to village N for the right to use; Finally, relevant village rules and regulations should be formulated to prohibit "solicitation" of Village B and the villagers' self-governing organizations should play the supervisory role. The key to effective rural governance lies in establishing a rural sound governance mechanism where the rural grassroots party organization leads, the township government is responsible, the villagers participate, the social forces collaborate, and the system of the rule of law and the legal institution provides the guarantee; while constructing a rural good governance pattern of co-construction, co-governance, and sharing, taking the rural good governance system, which integrates the autonomy, the rule of law, and the rule of virtue, as the core.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

Conceptualization, Data curation, Methodology, Writing - original draft LX; Software, Resources HZ; Formal analysis, Investigation VC; Project administration, Supervision WS; Validation, Writing - review and editing, Funding acquisition GC.

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