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Study on the Tripartite Game Model in Traditional Village Tourism Development: Strategic Evolution and Sustainable Development among Government, Developers, and Residents

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ABSTRACT

With the advancement of globalization and urbanization, traditional village tourism development has gradually become an important approach for local economic growth. However, in the process of traditional village tourism development, the interest game among the government, developers, and residents often leads to uneven resource allocation. Therefore, this paper builds a tripartite game model for traditional village tourism development based on evolutionary game theory. It deeply analyzes the game behaviors, interest relationships, and dynamic processes of strategy evolution of the government, developers, and residents under different strategies. First, this paper explains the basic assumptions of the tripartite game in detail. It clarifies the strategy space of the three parties and the method for constructing their payoff matrix. Next, the paper uses the replication dynamics equation to analyze the strategy choices and evolutionary paths of the three parties in different scenarios. It also validates the model's rationality and effectiveness through numerical simulation. The results show that high-cost investment increases development difficulty, leading all parties to adopt passive strategies. On the other hand, lower costs and higher rewards can promote the active participation of stakeholders and drive the successful implementation of the project. This study provides a theoretical basis for government departments to formulate reasonable policies, mobilize the enthusiasm of all parties. It also offers a theoretical basis for balancing ecological and economic benefits. Additionally, it offers policy recommendations for achieving sustainable development goals

KEYWORDS

Traditional Village Tourism Development; Evolutionary Game; Replication Dynamics; Sustainable Development.

1. INTRODUCTION

With the acceleration of globalization and urbanization, many traditional villages, under the dual pressure of economic transformation and population mobility, have gradually turned to tourism development as a key approach to promoting local economic growth, preserving traditional culture, and achieving sustainable development[1]. The development of traditional village tourism not only enhances economic vitality and infrastructure but also increases local residents' income levels and provides financial support for cultural heritage preservation. However, as tourism development progresses, the natural environment and social structure of villages often face unprecedented challenges. Balancing economic benefits with the preservation of cultural heritage and the ecological environment has become a central issue in traditional village tourism development [2].

The stakeholders involved in traditional village tourism development mainly include the government, developers, and residents. The government is typically responsible for policy formulation and implementation, regulating the direction and methods of tourism development through laws and regulations to ensure environmental protection and social equity during development. The government aims to boost the local economy, improve infrastructure, and increase employment opportunities through tourism development, while also facing the challenge of balancing short-term economic benefits with long-term sustainable development. Developers, as the practical operators, are committed to obtaining economic profits through development projects. During project development, they may face decisions on different development models, including sustainable green tourism or the risk of overdevelopment and resource overconsumption. As the directly benefiting or suffering group, residents often hope to improve their living conditions and enjoy economic benefits through tourism development. They may also be concerned about environmental degradation, a decline in quality of life, and the loss of cultural identity.

The strategic interactions in traditional village tourism development are characterized by significant complexity and dynamism[3]. The government, developers, and residents continuously adjust their strategies over time in response to new information and changes in external conditions. The interactions and interdependencies among these three stakeholders occur across multiple dimensions and levels. The government may implement stringent control measures to safeguard the ecological environment. Yet, excessive regulatory restrictions could hinder developers' investment enthusiasm and weaken residents' support. In contrast, regulatory relaxation may encourage developers to focus more on profit at the expense of environmental protection. As a result, residents' quality of life and the long-term sustainability of villages may be compromised[4]. Developers weigh ecological tourism against economic benefits, selecting among various development models. While residents gain financial benefits from tourism, they remain mindful of its impact on their living conditions. Their decisions to support or oppose development may depend on their individual interests[5].

With the growing complexity of issues, a singular management approach is often insufficient to address all conflicts and challenges. Hence, designing a tourism development model that accommodates the interests of all three stakeholders while achieving long-term sustainability has emerged as a critical research focus. Evolutionary game theory offers novel insights into resolving this challenge. The evolutionary game model employs mathematical frameworks to depict stakeholder interactions and decision-making dynamics in the game. Through simulations and analyses of long-term evolutionary trends, it determines stable strategy combinations and equilibrium states. It serves as a theoretical foundation for policymakers.

This study aims to develop a tripartite game model based on evolutionary game theory. It investigates the interactions and strategic evolution of the government, developers, and residents under various game strategies. Through mathematical modeling and numerical simulations, it explores how each stakeholder's behavior changes in response to varying costs, incentive mechanisms, and regulatory policies. Additionally, it examines how policy interventions can optimize tourism sustainability while ensuring maximum benefits for all parties. This research aims to provide a structured approach to resolving interest conflicts in traditional village tourism development. It seeks to foster a harmonious integration of economic growth, social well-being, and ecological sustainability in traditional villages.

2. CONSTRUCTION OF THE TRIPARTITE GAME MODEL FOR TRADITIONAL VILLAGE TOURISM DEVELOPMENT

Traditional village tourism development primarily involves three key stakeholders: the government, developers, and residents. A three-party game model is established according to their interactions.

2.1. Basic Assumptions

Drawing on existing studies[6], the government, developers, and residents are all assumed to be boundedly rational. The game participants and their respective strategic choices are as follows:

The government, acting as the regulator, can choose between strict regulation (x) and relaxed regulation (1-x). Developers, as the executors, have the option of green development (y) or overdevelopment (1-y). Residents, as participants, may either support (z) or oppose (1-z) tourism development.

The combination of strategies among the three parties results in eight possible game scenarios: (Strict regulation, green development, support), (Strict regulation, overdevelopment, support), (Strict regulation, green development, oppose), (Strict regulation, overdevelopment, oppose), (Relaxed regulation, green development, support), (Relaxed regulation, overdevelopment, support), (Relaxed regulation, green development, oppose), (Relaxed regulation, overdevelopment, oppose).

2.2. Construction of the payoff matrix

The meaning of each parameter is detailed in Table 1, while Table 2 displays the payoff matrix of the tripartite game[3].

Table 1. Basic variables in the evolutionary game model

Parameter	Parameter Description	Parameter Value Range
x	Probability of strict regulation by the government	$0 \le x \le 1$
1-x	Probability of relaxed regulation by the government	$0 \le 1-x \le 1$
y	Probability of green development by developers	$0 \le y \le 1$
1-y	Probability of overdevelopment by developers	$0 \le 1-y \le 1$
z	Probability of residents supporting tourism development	$0 \le z \le 1$
1-z	Probability of residents opposing tourism development	$0 \le 1-z \le 1$
C1	Cost of regulation for the government	$C1 \ge 0$
C2	Cost and risk for residents to file complaints with the government when their interests are violated	$C2 \ge 0$
B1	Indirect loss borne by the government due to overdevelopment by developers	$B1 \ge 0$
B2	Social benefits gained by the government when residents support development, improving government credibility	$B2 \ge 0$
I	Government incentives for green development and penalties for overdevelopment	$I \ge 0$
L	Negative market impact caused by the government’s relaxed regulation	$L \ge 0$
w	Expected revenue developers earn from sustainable development	$w \ge 0$
n1	Proportion of extra revenue gained when developers engage in overdevelopment	$n1 \ge 0$
n2	Compensation factor paid by overdeveloping developers to opposing residents when the government enforces regulations	$n2 \ge 0$
S1	Loss incurred by developers due to residents’ opposition to overdevelopment	$S1 \ge 0$
S2	Profit developers gain from positive resident engagement in green development	$S2 \ge 0$
S3	Loss incurred by residents due to declining village value caused by overdevelopment	$S3 \ge 0$
A	Government subsidies for residents who support development	$A \ge 0$
D	Additional income for residents who oppose development	$D \ge 0$

Table 2. Strategy combinations and payoff matrix of the tripartite game

		Residents Support development (z)	Resident Oppose development (1-z)
Governments Strict Regulation (x)	Developers Green development (y)	G1:-C1+B2-I-A D1:I+w+S2 R1:A	G2:-C1-I D2:I+w R2:-C2+D
	Developers Overdevelopment (1-y)	G3:-C1-B1+B2+I-A D3:-I+n1*w R3:A-S3	G4:-C1-B1+I D4:-I+n1*w-n1*n2*w-S1 R4:-C2+ n1*n2*w-S3+D
Governments Relaxed regulation (1-x）	Developers Green development (y)	G5:-L-A D5: w+S2 R5:A	G6: -L D6: w R6:-C2+D
	Developers Overdevelopment(1-y)	G7:-B1-L-A D7: w+n1*w R7:A-S3	G8:-B1-L D8: w+n1*w-S1 R8:-C2-S3+D

3. ANALYSIS OF THE THREE-PARTY EVOLUTIONARY GAME MODEL FOR TRADITIONAL VILLAGE TOURISM DEVELOPMENT

3.1. Replication Dynamics Equations of the Stakeholders

In evolutionary game theory, a strategy will evolve if its average payoff (or fitness) is higher than the system's (or population's) average payoff (or fitness). The proportion of individuals following that strategy in the system (or population) will rise at a positive rate. This is called the replication dynamics equation. The replication dynamics equations for the three agents are constructed based on their strategies and respective payoffs.

3.1.1. Replication Dynamics Equation of the Government

Let EX1 represent the government's expected payoff under the strong support strategy, and EX2 represent the expected payoff under the weak support strategy:

$$Ex1=(-C1+B2-I-A)*y*z+(-C1-I)*y*(1-z)+(-C1-B1+B2+I-A)*(1-y)*z+(-C1-B1+I)*(1-y)*(1-z) \quad (1)$$

$$Ex2=(-L-A)*y*z+(-L)*y*(1-z)+(-B1-L-A)*(1-y)*z+(-B1-L)*(1-y)*(1-z) \quad (2)$$

Thus, the government's replication dynamics equation can be expressed as:

$$\frac{dx}{dt} = F(x) = x(1-x)(Ex1 - Ex2) = x*(1-x)*(I - C1 + L + B2*z - 2*I*y) \quad (3)$$

3.1.2. Replication Dynamics Equation of the Developer

Let Ey1 represent the government's expected payoff under the green execution strategy, and Ey2 represent the expected payoff for the developer under the overdevelopment strategy:

$$Ey1 = (I + w + S2)*x*z + (I + w)*x*(1-z) + (w + S2)*(1-x)*z + w*(1-x)*(1-z) \quad (4)$$

$$Ey2 = (-I + n1*w)*x*z + (-I + n1*w - n1*n2*w - S1)*x*(1-z) + (w + n1*w)*(1-x)*z + (w + n1*w - S1)*(1-x)*(1-z) \quad (5)$$

Thus, the developer's replication dynamics equation can be expressed as:

$$\frac{dy}{dt} = F(y) = y(1-y)(Ey1 - Ey2) = y*(1-y)*(S1 + 2*I*x - S1*z + S2*z - n1*w + w*x + n1*n2*w*x - n1*n2*w*x*z) \quad (6)$$

3.1.3. Replication Dynamics Equation of the Resident

Let Ez1 represent the government's expected payoff under the participation strategy, and Ez2 represent the expected payoff for the resident under the non-participation strategy:

$$Ez1 = A*x*y + (A - S3)*x*(1-y) + A*(1-x)*y + (A - S3)*(1-x)*(1-y) \quad (7)$$

$$Ez2 = (-C2 + D)*x*y + (-C2 + n1*n2*w - S3 + D)*x*(1-y) + (-C2 + D)*(1-x)*y + (-C2 - S3 + D)*(1-x)*(1-y) \quad (8)$$

Thus, the resident's replication dynamics equation can be expressed as:

$$\frac{dz}{dt} = F(z) = z(1-z)(Ez1 - Ez2) = z*(1-z)*(A + C2 - D - n1*n2*w*x + n1*n2*w*x*y) \quad (9)$$

The above equation represents a tripartite dynamic replication system, where the government, developers, and residents are regarded as decision-makers. The probability/ratio of each stakeholder choosing a corresponding strategy changes over time as a response to individual decisions. This evolution can be explained by the fact that the government, developers, and residents intentionally alter their strategies through multiple rounds of the game, adopting new strategies to maximize their benefits. Our aim in this regard is to determine the maximum benefit for stakeholders by analyzing the goal of the tripartite evolutionary game, which is the evolutionarily stable strategy (ESS).

3.2. Analysis of the System's Local Asymptotic Stability

In the complex tripartite evolutionary game model involving the government, developers, and residents, x, y, and z do not operate independently; instead, they interact continuously within the system. Thus, it is necessary to further explore the local asymptotic stability of the whole system.

Meanwhile, by setting F(x) = 0, F(y) = 0, and F(z) = 0, 14 equilibrium points of the system can be derived. However, according to Friedman's first rule, ESS will only appear in pure strategies. Hence, mixed strategies are excluded, and the remaining eight pure strategies are analyzed in detail. The eight pure strategies are E1(0, 0, 0), E2(0, 0, 1), E3(0, 1, 0), E4(0, 1, 1), E5(1, 0, 0), E6(1, 0, 1), E7(1, 1, 0), and E8(1, 1, 1).

In exploring whether each equilibrium point is ESS, this chapter applies the Lyapunov stability criterion to assess whether the equilibrium is an ESS. The stability criterion states that for an equilibrium point in the game model system to be ESS, all eigenvalues of its Jacobian matrix must have negative real parts. If at least one eigenvalue has a positive real part, the equilibrium point is unstable. If all eigenvalues, except for those with a real part of 0, have negative real parts, the stability of the equilibrium point cannot be determined solely by the eigenvalues.

The Jacobian matrix of the tripartite evolutionary game is as follows:

$$J=[(1-2x)*(I-C1+L+B2*z-2*I*y),2*I*x*(x-1),-B2*x*(x-1)]$$
$$[y*(1-y)*(2*I+w+n1*n2*w-n1*n2*w*z),(1-2y)*(S1+2*I*x-S1*z+S2*z-n1*w+w*x+n1*n2*w*x-n1*n2*w*x*z),y*(y-1)*(S1-S2+n1*n2*w*x)]?$$
$$[z*(z-1)*(n1*n2*w-n1*n2*w*y),-n1*n2*w*x*z*(z-1),(1-2z)*(A+C2-D-n1*n2*w*x+n1*n2*w*x*y)]$$

By substituting these 8 specific equilibrium points into the Jacobian matrix, the corresponding eigenvalues of the Jacobian matrix are obtained. The eigenvalues for each equilibrium point are presented in Table 3.

Table 3. Analysis of equilibrium point stability

Equilibrium point	Equilibrium conditions	F11	F22	F33	Stability
E1(0,0,0)	S1 < n1*w, A+C2< D, I+L< C1	-	-	-	Asymptotically stable point
E2(0,0,1)	S2 < n1*w, D< A+C2, B2+I+L< C1	-	-	-	Asymptotically stable point
E3(0,1,0)	n1*w < S1, A+C2< D, L < I+C1	-	-	-	Asymptotically stable point
E4(0,1,1)	n1*w < S2, D < A+C2 , B2+L < I+C1	-	-	-	Asymptotically stable point
E5(1,0,0)	C1 < I+L, A+C2<D+n1*n2*w, 2*I+S1+w+n1*n2*w<n1*w	-	-	/	Unstable point
E6(1,0,1)	2*I+S2+w<n1*w, C1<B2+I+L,D+n1*n2*w<C2+A	/	-	-	Unstable point
E7(1,1,0)	A+C2< D, C1+I<L, n1*w<S1+w+2*I+n1*n2*w	-	-	-	Asymptotically stable point
E8(1,1,1)	D< A+C2 , C1+I<B2+L,n1*w<S2+w+2*I	-	-	-	Asymptotically stable point

4. NUMERICAL SIMULATION AND ANALYSIS

In the tripartite game model of traditional village tourism development, stakeholders update their strategies continuously by comparing their individual payoffs. Through repeated iterations, the system reaches a stable state. This chapter uses numerical simulations to analyze in detail the dynamic evolution of behavior strategies among the three stakeholders in traditional village tourism development and their impacts.

Numerical simulations were carried out under various parameter conditions, primarily simulating the evolution of stakeholder strategies over time under different initial conditions, and the evolution of strategies in three-dimensional space. The study investigates the various convergence directions and speeds of key parameters under local asymptotic stability conditions.

4.1. Initial Parameter Settings

According to the characteristics of the evolutionary game model, the initial values for the relevant parameters of the government, developers, and residents are provided in Table 4.

Table 4. Initial parameter settings for the evolutionary game model

Equilibrium point	C1	C2	B1	B2	I	L	W	n1	n2	S1	S2	S3	A	D
E1	30	10	5	5	10	10	30	1	1	20	10	10	20	50
E2	30	10	5	5	10	10	30	1	1	20	10	10	20	20
E3	30	10	5	5	10	10	30	1	1	40	10	10	20	50
E4	30	10	5	5	10	10	30	1	1	20	40	10	20	20
E7	30	10	5	5	10	50	30	1	1	20	10	10	20	50
E8	30	10	5	5	10	10	30	1	1	20	10	10	20	20

4.2. Six Evolutionarily Stable Strategies

(1) Case 1: The equilibrium point E1(0,0,0) is an ESS

When the equilibrium point E1(0,0,0) is ESS, the parameters must satisfy the conditions: $S1 < n1*w$, $A + C2 < D$, $and\, I + L < C1$. Therefore, set C1 = 30, C2 = 10, B1 = 5, B2 = 5, I = 10, L = 10, w = 30, n1 = 1, n2 = 1, S1 = 20, S2 = 10, A = 20, and D = 50. The results of the evolutionary simulation are shown in the figure. The simulation results indicate that when the government, developers, and residents face high base costs and relatively low investments, regardless of initial conditions, all three parties' strategies generally trend towards passivity. This indicates that high investment costs have failed to drive the project forward, and lower investment levels lead to a greater tendency for all parties to adopt passive behaviors, ultimately affecting the project's overall progress.

(2) Case 2: ESS The equilibrium point E2(0,0,1) is an ESS

When the equilibrium point E2(0,0,1) is an ESS, the parameters must satisfy the conditions: $S2 < n1*w$, $D < A + C2$, $and\, B2 + I + L < C1$. Set C1 = 30, C2 = 10, B1 = 5, B2 = 5, I = 10, L = 10, w = 30, n1 = 1, n2 = 1, S1 = 20, S2 = 10, A = 20, and D = 20. The results of the evolutionary simulation are shown in the figure. The results indicate that, under varying initial conditions, as the rewards available to residents increase, their strategy will evolve from initially passive participation to more active full involvement in tourism development. This suggests that offering generous rewards to encourage positive actions, along with high-return incentives, can effectively stimulate residents' involvement in traditional village tourism development projects. Such active participation not only contributes to the successful implementation of the project but also fosters the prosperity and sustainability of village tourism.

(3) Case 3: The equilibrium point E3(0,1,0) is an ESS.

When the equilibrium point E3(0,1,0) is an ESS, the parameters must meet the conditions: $n1*w < S1$, $A + C2 < D$, $and\, L < I + C1$. Therefore, set C1 = 30, C2 = 10, B1 = 5, B2 = 5, I = 10, L = 10, w = 30, n1 = 1, n2 = 1, S1 = 40, S2 = 10, A = 20, and D = 50. The results of the evolutionary simulation are shown in the figure. The evolutionary results show that when the base cost for developers to carry out eco-tourism development decreases and they face higher penalties, under varying initial conditions, developers' strategies generally tend to opt for full eco-tourism development. This suggests that stringent penalty regulations, along with lower eco-tourism development costs, can effectively encourage developers to adopt more environmentally friendly practices. In such cases, developers are more motivated to adhere to ecological principles, as they can both lower costs and avoid substantial penalties. This approach benefits environmental protection, enhances the sustainability of tourism projects, and meets social and regulatory requirements for ecological conservation.

(4) Case 4: The equilibrium point E4(0,1,1) is an ESS

When the equilibrium point E4(0,1,1) is an ESS, the parameters must meet the conditions: $n1*w < S2,\ D < A + C2,\ and\ B2 + L < I + C1$. Thus, the parameter values are set as follows: C1 = 30, C2 = 10, B1 = 5, B2 = 5, I = 10, L = 10, w = 30, n1 = 1, n2 = 1, S1 = 20, S2 = 10, A = 5, D = 50. The results of the evolutionary simulation are shown in the figure. The simulation results indicate that under varying initial conditions, when the base cost for developers and residents decreases, their effort increases, and they can receive greater rewards, their strategies will evolve from initial partial participation and passive actions to full, more active involvement. This suggests that as costs decrease and rewards increase, developers and residents will be more motivated to actively engage in tourism development projects, driving the successful execution and growth of the project. Moreover, when developers are faced with stricter penalties, they are more likely to choose a complete eco-tourism development strategy, emphasizing ecological conservation. This demonstrates that through enforcing strict penalty mechanisms, the government can effectively motivate developers to adopt eco-friendly behaviors, ensuring the sustainability of eco-tourism development projects while meeting environmental and regulatory standards. Government regulation and incentive policies play a key role in balancing development with environmental protection.

(5) Case 5: The equilibrium point E5(1,1,0) is an ESS

When the equilibrium point E5(1,1,0) is an ESS, the parameters must meet the conditions: $A + C2 < D,\ C1 + I < L,\ and\ n1*w < S1 + w + 2I + n1*n2*w$. Thus, set C1 = 30, C2 = 10, B1 = 5, B2 = 5, I = 10, L = 10, w = 30, n1 = 1, n2 = 1, S1 = 20, S2 = 10, A = 5, and D = 50. The results of the evolutionary simulation are shown in the figure. The simulation results show that under varying initial conditions, when developers face higher penalties and the potential for greater losses due to passive participation from residents, they tend to adopt the full eco-tourism development strategy. This suggests that the government's penalty measures and residents' resistance behaviors play a crucial role in effectively restricting developers' violations. As risks and losses rise, developers are more motivated to follow ecological principles to avoid greater penalties and losses. Consequently, the government's penalty policies, combined with residents' passive behaviors, create an effective counterbalance mechanism that encourages developers to act more cautiously and responsibly in eco-tourism development. Such constraints and limitations not only contribute to environmental protection and ensure the project's sustainability but also safeguard the interests of all stakeholders.

(6) Case 6: The equilibrium point E6(1,1,1) is an ESS

When the equilibrium point E6(1,1,1) is an ESS, the parameters must meet the conditions: $D < A + C2,\ C1 + I < B2 + L,\ and\ n1w < S2 + w + 2I$. Thus, set C1 = 30, C2 = 10, B1 = 5, B2 = 5, I = 10, L = 10, w = 30, n1 = 1, n2 = 1, S1 = 20, S2 = 10, A = 5, and D = 50. The results of the evolutionary simulation are shown in the figure. The simulation results indicate that under varying initial conditions and scenarios, when the government reduces rewards for developers and residents, the overall cost of the government decreases, thus facilitating the evolution of full support and regulatory behaviors. This suggests that the government is inclined to implement the project in a more economically efficient way and requires developers and residents to adhere to stricter regulations, ensuring the success and sustainability of the project. This shift reflects the government's optimization of resource allocation, aimed at ensuring the feasibility and effectiveness of the project. Furthermore, when developers face higher penalties and potential greater losses due to violations, they are more motivated to adopt regulated behaviors and implement the full eco-tourism development strategy. This shows that the government's mandatory penalty measures can effectively prompt developers to follow ecological protection principles, minimizing potential negative effects on the environment and community. Such policy measures contribute to maintaining ecological balance, ensuring the long-term sustainable development of the project, and advancing environmental protection and regulatory compliance.

Based on the analysis of the evolutionarily stable strategies (ESS) in the six cases above, the following conclusions can be made: During the traditional village tourism development process, when the base costs for the three stakeholders are high, they will continuously assess and compare potential benefits, eventually leaning towards passive participation. As a result, high investment costs hinder the smooth progress of traditional village tourism development, emphasizing the pivotal role of cost factors in project decision-making.

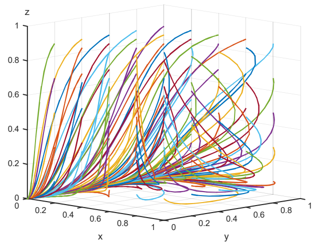
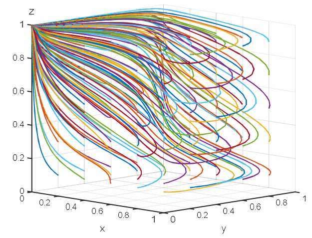
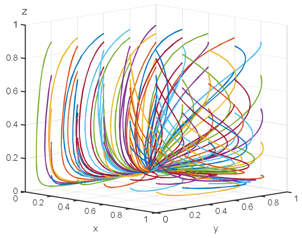

Figure 1. (a)E1(0,0,0) **Figure 2.** E2(0,0,1) **Figure 3.** (c) E3(0,1,0)

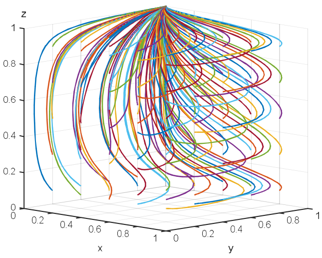
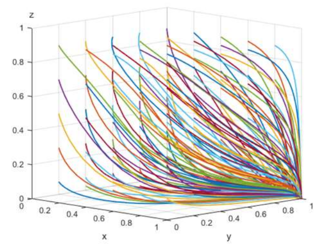
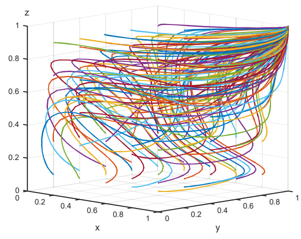

Figure 4. (d) E4(0,1,1) **Figure 5.** (e) E7(1,1,0) **Figure 6.** (f) E8(1,1,1)

5. RESEARCH CONCLUSIONS AND RECOMMENDATIONS

In the context of sustainable development, this paper applies evolutionary game theory to study the interactions and constraints of interests between the government, developers, and residents in traditional village tourism development. A dynamic evolutionary game model is developed to thoroughly examine the evolution of strategies among the stakeholders. Based on numerical simulation and analysis, we draw the following conclusions and insights:

(1) The evolution of stakeholders' strategies is a process of mutual influence and continuous optimization. The constructed dynamic model and stability analysis reveal the conditions for the evolution of strategies toward an ideal stable state. High costs have a significant negative impact on tourism development, increasing development difficulty and leading all parties to adopt passive strategies. Moreover, the initial state of the game participants does not affect the final evolutionary result.

(2) The government's decision-making is influenced by reputation loss. Reputation loss effectively constrains government decisions through public feedback mechanisms. Thus, active public oversight helps prompt the government to take more proactive actions.

(3) Government regulation of developers is essential. The government’s penalty policies are effective in regulating developers' ecological behavior. Lower penalties reduce the constraints on violations, thus increasing the risk of violations. Therefore, the government should strengthen penalty measures for developers to encourage eco-friendly development practices.

(4) Residents' decisions are influenced by additional income. When the extra income from other activities surpasses the benefits from tourism development, residents tend to engage in other activities. Therefore, the government and developers should use incentive policies to encourage residents to actively participate in tourism development projects.

In conclusion, this paper reveals the complexity of the interests in traditional village tourism development. To achieve sustainable development, the government and developers should comprehensively consider these factors and take measures to encourage active participation from all parties to ensure the harmonious development of the environment, culture, and society.

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