

## Research on the Stakeholders of PPP Projects in Characteristic Towns

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**Abstract:** The characteristic town is an important practice of promoting sustainable economic development in China. Its emergence is an inevitable product of economic development at a certain stage. It has a distinctive epochal character. The characteristic town is “small but key” and plays the role of “industrial tipping point” and “factor hub”, which can effectively promote the integration of industry and city. However, the current development of the town faces the problem that the participants do not cooperate closely, so in order to achieve the sustainable development of the characteristic town, It is very important to establish a reasonable mechanism to form a win-win situation between the government, social capital and small town residents. This paper focuses on the strategic choice and influencing factors of stakeholders in the characteristic town PPP project from a dynamic perspective, and based on the evolutionary game theory, takes the government, social capital and town residents as stakeholders in the characteristic town PPP project, constructs the three-party evolutionary game model of “government department - social capital - characteristic town residents”, and studies the impact of relevant parameters on the three-party behavior strategy, At the same time, take Jiashan Chocolate Town as a case for further study. The research shows that the implementation of incentive policies by the government, the active investment by the social capital and the participation of the town residents in the supervision can reduce the costs of the participants, improve the income of the town PPP project, and ultimately achieve a win-win situation for all parties. Finally, the application experience, shortcomings and suggestions of the characteristic town PPP project are put forward based on the case.

### 1. Introduction

The development of PPP model was proposed by the State Council in 2014, and according to the relevant data, by 2020, there will be 10,338 PPP projects nationwide, of which 866 are demonstration projects with a total investment of 201.15 billion yuan, and China is now the largest PPP market in the world. Based on this, the National Development and Reform Commission has made clear instructions: “innovate the investment and financing mechanism for the development of characteristic small (city) towns, actively promote the cooperation between the government and social capital, and strive to achieve the situation of using a small amount of government funds to reach four or two thousand jin, from which it can be seen that at the national policy level, the cooperation between the government and social capital (PPP mode), has become an important government and social capital In July 2016, the Ministry of Housing and Urban-Rural Development, the National Development and Reform Commission and the Ministry of Finance jointly announced the Notice on Cultivating Small Towns with Special Characteristics, proposing to cultivate small towns with special characteristics nationwide and to cultivate about 1,000 distinctive and vibrant small towns with special characteristics by 2020 [Source: Ministry of Housing and Urban-Rural Development, National Development and Reform Commission, Ministry of Finance 2016 Notice on the Cultivation Work of Characteristic Small Towns (Jiancun [2016] No. 147)] issued. The introduction of this policy will certainly generate a large amount of investment demand, and the PPP model will open up new application areas based on its own attributes, so the high-quality development of many characteristic towns is currently achieved under the guidance of the government and the intervention of enterprises, and the introduction of social capital and the construction of characteristic towns will, on the one hand, make the social and economic benefits of the local government, the relevant enterprises in the characteristic industry and the town residents

greatly On the other hand, it also provides successful experiences for the implementation of rural revitalization strategy for reference. For example, Yuhuang Shanan Fund Town in Hangzhou, Jinling Town in Jiangsu Province, and Wuhu Aviation Town in Anhui Province. However, due to the characteristics of long period, large investment amount and the reality of asymmetrical status of participants in the governance of PPP projects in featured towns, there is not enough trust between social capital parties and the government, which further leads to the failure to reasonably share the risks and benefits. Therefore, the different interests and strategies of the participants in the characteristic town PPP project constitute a different dynamic game process in terms of benefit distribution.

Both the characteristic town and PPP are relatively new in China, and domestic and foreign research mainly takes the real option game theory (RO-GT) as the model and modifies the Shapley value allocation model to study the benefit allocation of PPP projects. In addition, the existing literature does not pay much attention to why they should be applied, what aspects should be applied, what problems should be paid attention to in the application, and what effects can be achieved, etc. Therefore, the application of PPP projects in characteristic towns has research value. The innovation of this paper is that (1) most of the current researches on characteristic towns and PPP projects are theoretical, and there are few papers that combine the two. (2) The construction and development of special towns are changing rapidly, but the existing literature still adopts the classical static game for the relationship between the participating parties of special towns, i.e., all participants are “perfectly rational”. In practice, the participants in the development of PPP projects in the characteristic town cannot always be “completely rational”. Therefore, this paper analyzes the strategy adjustment between the participants in the construction and development of the characteristic town based on the fact that the participants are “limited rational”, and explores a sustainable path for the development of the characteristic town.

## 2. Stakeholder Evolutionary Game Analysis of PPP Projects in Special Towns

### 2.1 Model Assumptions

Hypothesis 1: The local government is participant 1, the social capital party is participant 2, and the town residents are participant 3. Since it is impossible to have complete information to choose the best strategy to maximize benefits, decisions can only be made based on partial information. Therefore, this paper assumes that the local government, the social capital party, and the town residents are finite rational economic entities/people<sup>[1]</sup>, and the finite rationality determines that these three parties do not discover the optimal strategy initially, but can only learn in the game process and modify it accordingly so that it tends to be evolutionarily stable.

Hypothesis 2: The local government's strategy space  $\alpha = (\alpha_1, \alpha_2)$  = (implement incentive policy, do not implement incentive policy), the probability of implementing incentive policy is  $x$ , the probability of not implementing incentive policy is  $(1-x)$ ,  $x \in [0,1]$ ; where, the incentive system refers to the local government to give certain rewards when the social capital party makes active investment and the town residents actively participate in the project activities, and to punish them when they have The incentive system is a system that punishes the social capitalists when they make active investments and the town residents actively participate, and punishes them when they have speculative behaviors in project activities. The strategy space  $\beta=(\beta_1, \beta_2)$ =(active investment, inactive investment) of the social capital party, the probability of active investment is  $y$ , the probability of inactive investment is  $(1-y)$ ,  $y \in [0,1]$ . The strategy space of town residents  $\gamma = (\gamma_1, \gamma_2)$  = (participate in supervision, not participate in supervision), the probability of participating in supervision is  $z$ , and the probability of not participating in supervision is  $(1-z)$ ,  $z \in [0,1]$ .

Hypothesis 3: If the basic benefit of local government does not implement incentive policy is  $R_1$ , the local government does not implement incentive policy, the social capital party and town residents are not highly motivated to participate, then the services provided by the characteristic town PPP project are ordinary services, and the service price that service users are willing to pay at this time is not high. If the incremental benefit of the government's incentive policy is  $R_2$ , and the

government implements the incentive policy, the participation enthusiasm of social capital parties and town residents increases due to the consideration of cost reduction and the quality characteristics of the characteristic town - the agglomeration of the leading industry drives the agglomeration of talent and capital elements, the services provided by the characteristic town PPP project are quality services, and the service price that the service users are willing to pay will be increased. The basic cost of the government to implement the incentive policy (e.g. the cost of promoting the policy) is  $C_1$ . If the social capitalists actively invest and the residents of the town participate in the supervision, it will solve the problem of the capital demand of the characteristic town, introduce the technical and management advantages of the social capitalists, and greatly enhance the credibility of the government under supervision. Therefore, the government will give incentives to them, and reward  $C_2$  and  $C_3$  to the social capital party and town residents who actively participate in the PPP project of the characteristic town, respectively. If the local government does not implement the incentive policy, the government's credibility and reputation will be lost  $L$ .

Hypothesis 4: If the social capital party does not actively participate in the characteristic town PPP project, the PPP project is not well-funded, so that the services provided by the PPP project are ordinary services, the service users are not willing to pay a high price for this, at this time the social capital party's benefit is  $R_3$ , if the social capital party actively participates in the characteristic town PPP project, the PPP project is well-funded so that the services provided by the PPP project are high quality services, at this time the service users are not willing to pay a high price for this, at this time the social capital party's benefit is  $R_3$ . The incremental benefit of the social capital party is  $R_4$ , while the government gives tax incentives and financial subsidies to the active participation of the social capital party is  $R_5$ , where  $R_5=C_2$ . The cost of the social capital party not actively participating in the characteristic town PPP project is  $C_4$ , and the incremental cost of the social capital party actively participating in the characteristic town PPP project is  $R_5$ . The incremental cost of the PPP project (e.g., research cost: because the development model of the characteristic town is novel and there is little experience to draw on, a lot of research activities must be conducted for the healthy and orderly development of the characteristic town project) is  $C_5$ .

Hypothesis 5: If the residents of the town participate in supervision, the government gives the reward as  $R_6$ , where  $R_6=C_3$ , and the cost to be paid is recorded as  $C_6$ , if the residents find that the social capital party is actively involved in participating in the construction of the characteristic town in the supervision will make the social capital party's prestige level rise  $D$ .

## 2.2 Model Construction

According to the above assumptions, the mixed strategy game matrix of the government, social capitalist and town residents, as shown in Table 1.

Table 1 Tripartite Game Matrix Benefit Table

		Social Capital Parties	Small Town Residents	
			Probability of participation in supervision: $z$	Probability of not participating in supervision: $1-z$
Government	Probability of implementing incentive policies: $x$	Probability of active investment: $y$	$R_1+R_2+U-C_1-C_2-C_3$ , $R_3+R_4+R_5-C_4-C_5+D$ , $R_6-C_6$	$R_1+R_2+U-C_1-C_2$ , $R_3+R_4+R_5-C_4-C_5$ , $0$
		Probability of not actively investing: $1-y$	$R_1+R_2+U-C_1-C_3$ , $R_3-C_4$ , $R_6-C_6$	$R_1+R_2+U-C_1$ $R_3-C_4$ , $0$
	Probability of not implementing the incentive policy: $1-x$	Probability of active investment: $y$	$R_1-L$ , $R_3+R_4-C_4-C_5+D$ , $-C_6$	$R_1$ , $R_3+R_4-C_4-C_5$ , $0$
		Probability of not actively investing: $1-y$	$R_1-L$ , $R_3-C_4$ , $-C_6$	$R_1$ , $R_3-C_4$ , $0$

## 2.3 Model Analysis

### 2.3.1 Analysis of the Stability of the Government Side's Strategy

The expected benefit of the government implementing the incentive policy is  $Ug_1$ , the expected benefit of the government not implementing the incentive policy is  $Ug_2$  and the average expected benefit  $Ug$  are:

$$Ug_1 = R_1 - C_1 + R_2 + U - C_2 * y - C_3 * z \quad (1)$$

$$Ug_2 = R_1 - L * z \quad (2)$$

$$Ug = R_1 - C_1 * x - L * z + R_2 * x + U * x - C_2 * x * y - C_3 * x * z + L * x * z \quad (3)$$

The replication dynamic equation for government strategy selection is as follows:

$$F(x) = dx/dt = x(Ug_1 - Ug) = x * (x - 1) * (C_1 - R_2 - U + C_2 * y + C_3 * z - L * z) \quad (4)$$

The first-order derivatives of  $x$  and the set  $G(y)$  are, respectively:

$$d(F(x))/dx = (2x - 1) * (C_1 - R_2 - U + C_2 * y + C_3 * z - L * z) \quad (5)$$

$$G(y) = (C_1 - R_2 - U + C_2 * y + C_3 * z - L * z) \quad (6)$$

Based on the stability theorem of the differential equation, the government party to implement the incentive policy in a stable state must satisfy:  $F(x)=0$  and  $d(F(x))/dx<0$ , when  $y=(L * z - C_3 * z - C_1 + R_2 + U)/C_2 = y^*$ ,  $G(y)=0$ , at this time  $F(x)=0$  and  $d(F(x))/dx=0$ , at this time all  $x$  are in an evolutionary stable state; so When  $y < y^*$ ,  $G(y) < 0$ , at this time, when  $x=1$ ,  $d(F(x))/dx < 0$ , so  $x=1$  is the evolutionary stable strategy of the government side, that is, at this time the evolutionary stable strategy of the government side is to implement the incentive policy; conversely, when  $y > y^*$ ,  $G(y) > 0$ , at this time  $x=0$  is the evolutionary stable strategy of the government side, that is, at this time the evolutionary stable strategy of the government side is not to implement the incentive policy.

### 2.3.2 Strategy Stability Analysis of Social Capital Parties

The expected return for active investment by the social capitalist is  $Ue_1$ , the expected return for inactive investment by the social capitalist is  $Ue_2$  and the average expected return  $Ue$  are:

$$Ue_1 = R_3 - C_5 - C_4 + R_4 + D * z + R_5 * x \quad (7)$$

$$Ue_2 = R_3 - C_4 \quad (8)$$

$$Ue = R_3 - C_4 - C_5 * y + R_4 * y + D * y * z + R_5 * x * y \quad (9)$$

From the above set of equations, it is obtained that the replication dynamic equation of the social capital side and its first order derivative are :

$$F(y) = dy/dt = y(Ue_1 - Ue) = y * (1 - y) * (R_4 - C_5 + D * z + R_5 * x) \quad (10)$$

$$d(F(y))/dy = (1 - 2y) * (R_4 - C_5 + D * z + R_5 * x) \quad (11)$$

Supposing:

$$J(z) = R_4 - C_5 + D * z + R_5 * x \quad (12)$$

According to the stability theorem of differential equation, the social capital party active investment in a stable state must meet:  $F(y)=0$  and  $d(F(y))/dy<0$ , when  $z=(C_5 - R_4 - R_5 * x)/D = z^*$ ,  $J(z)=0$ , at this time  $F(y)=0$ ,  $d(F(y))/dy=0$ , at this time all  $y$  are in the evolutionary stable state, so the classification discussion, when  $z > z^*$ ,  $J(z) > 0$ , at this time, when  $y=1$ ,  $d(F(y))/dy < 0$ , so  $y=1$  is the evolutionary stable strategy of the social capital side, that is, at this time, the evolutionary stable strategy of the social capital side is active investment; conversely, when  $z < z^*$ ,  $J(z) < 0$ , at this time, when  $y=0$  is the evolutionary stable strategy of the social capital side, that is, at this time, the evolutionary stable strategy of the social capital side is not active investment.

### 2.3.3 Analysis of the Strategic Stability of Small Town Residents

The expected benefits  $Uc_1$  for town residents participating in supervision,  $Uc_2$  for town residents not participating in supervision, and the average expected benefits  $Uc$  are:

$$Uc_1 = R_6 * x - C_6 \quad (13)$$

$$Uc_2 = 0(14)$$

$$Uc = -z * (C_6 - R_6 * x)(15)$$

The replicated dynamic equation, the first-order derivative of z, and the set H(x) for the small-town resident strategy choice are:

$$F(z) = dz/dt = z(Uc_1 - Uc) = z * (C_6 - R_6 * x) * (z - 1)(16)$$

$$d(F(z))/dz = (2z - 1) * (C_6 - R_6 * x)(17)$$

$$H(x) = C_6 - R_6 * x(18)$$

The town residents' participation in supervision is in a stable state must satisfy:  $F(z) = 0$  and  $d(F(z))/dz < 0$ . When  $x = C_6 / R_6 = x^*$ ,  $H(x) = 0$  and  $d(F(z))/dz = 0$ , at this time all z are in an evolutionary stable state; when  $x < x^*$ ,  $H(x) > 0$  and  $z = 0$  for the evolutionary stable strategy, that is, at this time the town residents' evolutionary stable strategy is not to participate in supervision. Conversely, when  $x > x^*$ ,  $H(x) < 0$  and  $z = 1$  for the evolutionary stable strategy, that is, at this time the town residents' evolutionary stable strategy is to participate in supervision.

### 2.3.4 Stability Study of the Equilibrium Point of a Three-Party Evolutionary Game System

Further, by solving the set of replicated dynamic equations consisting of the replicated dynamic equations of the government side, the social capital side, and the town residents, it is calculated that there are 16 equilibrium points in the game process for the government side, the social capital side, and the town residents, which are  $E_1(0, 0, 0)$ ,  $E_2(0, 0, 1)$ ,  $E_3(0, 1, 0)$ ,  $E_4(1, 0, 0)$ ,  $E_5(1, 1, 0)$ ,  $E_6(1, 0, 1)$ ,  $E_7(0, 1, 1)$ ,  $E_8(1, 1, 1)$ ,  $E_{9-16}(x^*, y^*, z^*)$ , according to Friedman's theory, the upper system equilibrium point is not necessarily the evolutionary stability strategy of this replicated dynamic system, and it is necessary to analyze the local stability problem by constructing Jacobi matrices, but considering the practical utility of equilibrium points, this paper does not. For the remaining eight equilibria, the evolutionary stability can be determined by the eigenvalues of the Jacobi matrices corresponding to each equilibrium, which are stable when the corresponding eigenvalues of each equilibrium are less than 0<sup>[2]</sup>;

$$J = \begin{bmatrix} \frac{\partial F(x)}{\partial x} & \frac{\partial F(x)}{\partial y} & \frac{\partial F(x)}{\partial z} \\ \frac{\partial F(y)}{\partial x} & \frac{\partial F(y)}{\partial y} & \frac{\partial F(y)}{\partial z} \\ \frac{\partial F(z)}{\partial x} & \frac{\partial F(z)}{\partial y} & \frac{\partial F(z)}{\partial z} \end{bmatrix} = \begin{bmatrix} J_1 & J_2 & J_3 \\ J_4 & J_5 & J_6 \\ J_7 & J_8 & J_9 \end{bmatrix}$$

$$J_1 = (2x - 1) * (C_1 - R_2 - U + C_2 * y + C_3 * z - L * z)(19)$$

$$J_2 = C_2 * x * (x - 1)(20)$$

$$J_3 = x * (C_3 - L) * (x - 1)(21)$$

$$J_4 = R_5 * y * (1 - y)(22)$$

$$J_5 = (1 - 2y) * (R_4 - C_5 + D * z + R_5 * x)(23)$$

$$J_6 = D * y * (1 - y)(24)$$

$$J_7 = R_6 * z * (1 - z)(25)$$

$$J_8 = 0(26)$$

$$J_9 = (2z - 1) * (C_6 - R_6 * x)(27)$$

For example, the Jacobi matrix of the equilibrium point  $E_1(0,0,0)$  can be abbreviated as:  $J_1 = \begin{pmatrix} R_2 + U - C_1 & 0 & 0 \\ 0 & R_4 - C_5 & 0 \\ 0 & 0 & -C_6 \end{pmatrix}$ , The eigenvalues of this Jacobi matrix are  $R_4 - C_5$ ,  $-C_6$ ,  $R_2 - C_1 + U$ . Similarly, the corresponding Jacobi matrix eigenvalues for the other seven practically significant equilibria are shown in Table 2:

Balancing point	Jacobian Matrix Eigenvalues $\lambda_1, \lambda_2, \lambda_3$	Real part symbol	Stability Conclusion	Conditions
$E_1(0,0,0)$	$R_4 - C_5, -C_6, R_2 - C_1 + U$	(+, -, +)	Instability point	/
$E_2(0,0,1)$	$-C_6, D - C_5 + R_4, L - C_3 - C_1 + R_2 + U$	(-, +, +)	Instability point	/
$E_3(0,1,0)$	$C_5 - R_4, -C_6, R_2 - C_2 - C_1 + U$	(-, -, -)	ESS	①
$E_4(0,1,0)$	$C_6, C_5 - D - R_4, L - C_2 - C_3 - C_1 + R_2 + U$	(+, -, +)	Instability point	/

$E_5(1,0,0)$	$R_6 - C_6, C_1 - R_2 - U, R_4 - C_5 + R_5$	$(+, -, -)$	Instability point	/
$E_6(1,0,1)$	$C_6 - R_6, D - C_5 + R_4 + R_5, C_1 + C_3 - L - R_2 - U$	$(-, +, -)$	Instability point	/
$E_7(1,1,0)$	$R_6 - C_6, C_5 - R_4 - R_5, C_1 + C_2 - R_2 - U$	$(+, -, -)$	Instability point	/
$E_8(1,1,1)$	$C_6 - R_6, C_5 - D - R_4 - R_5, C_1 + C_2 + C_3 - L - R_2 - U$	$(-, -, -)$	ESS	②

Note: If the conditions corresponding to the equilibrium point are not satisfied, the equilibrium point is unstable or meaningless. Based on the expressions of the eigenvalues corresponding to the Jacobi matrix for each equilibrium point in the table, the stability of each equilibrium point is discussed by setting the following conditions according to the range of values of each reference in the expressions: ①  $C_5 - R_4 < 0$  且  $R_2 - C_2 - C_1 + U < 0$ ; ②  $C_6 - R_6 < 0$  且  $C_5 - R_4 < 0, C_1 + C_2 + C_3 - R_2 - U < 0$ ;

Table 2 Eigenvalues of Each Equilibrium Point Corresponding to the Jacobi Matrix

Scenario 1: When  $C_5 - R_4 < 0$  and  $R_2 - C_2 - C_1 + U < 0$ , for the government side, the incremental benefits, credibility, and reputation enhancement brought by implementing the incentive policy are smaller than the basic costs of implementing the incentive policy (e.g., publicity and promotion policy costs, etc.) and its incentives to the social capital side that actively participates in the characteristic town PPP project. For social capital parties, the incremental benefits from active participation in the PPP project of the featured town outweigh the incremental costs. For the residents of the town, they tend to choose not to participate in the supervision after the absence of financial incentives from the government side. At this point,  $E_3(0, 1, 0)$  is the stable point of the game model, i.e., the strategy adopted by the government, social capital, and town residents is (no incentive policy, active investment, and no supervision).

Scenario 2: When  $C_6 - R_6 < 0$  and  $C_5 - R_4 < 0, C_1 + C_2 + C_3 - R_2 - U < 0$ , for the government side, the sum of the incremental benefits and credibility and reputation enhancement brought by the implementation of the incentive policy is greater than the basic cost of implementing the incentive policy (such as the cost of promoting the policy, etc.) and the incentive incurred by the social capital side and town residents who actively participate in the PPP project of the special town. The sum of the costs for the social capitalists and residents of the town. For the social capitalists, the incremental benefit of actively participating in the PPP project of the special town is greater than the incremental cost. For the town residents, the benefits of their participation in monitoring the incentives given by the government are greater than the costs spent on participation. At this point,  $E_8(1, 1, 1)$  is the stable point of this game model, i.e., the strategy adopted by the government side, the social capital side, and the town residents is (implement incentive policies, actively invest, and participate in supervision).

By formulating the logical relationship diagram of the evolution of the tripartite game among the participating subjects of the PPP project in the special town, and on this basis, the mixed strategy game matrix of the government side, social capital side and town residents and the expected game model are constructed; secondly, the strategy stability of the government side, social capital side and town residents is analyzed, and according to the replicated dynamic equations of each subject, finally the equilibrium point of the tripartite evolutionary game system is Stability is analyzed, and the set of replication dynamic equations composed of replication dynamic equations of the government side, social capital side and town residents is further solved. It is known through calculation that there are 16 equilibrium points in the game process for the government side, social capital side and town residents, but considering the actual utility of the equilibrium points, the specific expressions of the equilibrium points with no practical significance are not listed in this chapter, and the remaining eight equilibrium points with Whether the remaining eight equilibrium points with real significance are evolutionarily stable can be judged by the eigenvalues of their corresponding Jacobi matrices, according to which two corollaries are proposed: when  $C_5 - R_4 < 0$  and  $R_2 - C_2 - C_1 + U < 0$ , there exists a stable point of the replicated dynamic system, namely  $E_3(0, 1, 0)$ , when  $C_6 - R_6 < 0$  and  $C_5 - R_4 < 0, C_1 + C_2 + C_3 - R_2 - U < 0$ , the replicated There is another stable point in the dynamic system, namely  $E_8(1, 1, 1)$ , and the strategy combination evolution tends to the stable point of (no incentive policy, active investment, not involved in supervision) and the stable point of (incentive policy, active investment, involved in supervision) respectively under the scenario of satisfying different conditions corresponding to the equilibrium point, according to

the different initial points chosen by the three strategies. In order to further verify the necessity of the strategy choice of the game evolution subjects for the sustainable development of the special town, this paper takes the strategy choice of the government, social capitalists and town residents as a case study (implement incentive policies, actively invest, and participate in supervision).

### **3. Featured Town Case**

#### **3.1 Overview of the Town**

As the first batch of service industry characteristic town in Zhejiang Province and the first domestic characteristic town integrating industry, tourism and culture, it is located in the center of Yangtze River Delta metropolitan circle at the intersection of Jiang, Zhejiang and Shanghai provinces and cities, adjacent to Jiashan high-speed intersection and high-speed railway station, with convenient transportation. With a total investment of 5.5 billion yuan, the town will become a one-stop sweet theme experience town with the organic combination of leisure and vacation, cultural creativity and romantic style through the construction of Yunlanwan Hot Spring, Gaffeson Chocolate and other major projects, Flower Avenue, Hot Spring Avenue, Chocolate Avenue, Visitor Distribution Center, and other tourism supporting projects.

#### **3.2 Special Town PPP Project**

Due to the long construction period and large capital demand of the town, there is an urgent need to introduce diversified investment subjects for the construction of the special town and establish an investment and financing model based on the general participation of social capital and led by the government<sup>[3][4]</sup>, which seeks to leverage huge social funds with less financial capital, so the town signed six PPP projects of the chocolate special town at the World Congress of Zhejiang Business in October 2015 . The executive unit of the project is a government function department designated by the Jiashan municipal government, and the social capital party establishes Jiashan Chocolate Town Development Co., Ltd. through equity cooperation, with the residents of the town and the government party as project participants to actively supervise the construction and operation of the project . At the beginning of the project construction, the project return method is clearly defined: feasibility gap subsidy, etc., that is, the project company takes the feasibility gap subsidy to recover the investment during the operation period, construction and maintenance costs, obtain reasonable return on investment, etc. and obtain a reasonable return on investment.

#### **3.3 Analysis of the Main Interest Subjects of Zhejiang Jiashan Chocolate Special Town PPP Project**

In recent years, Chocolate Town has been broadening new channels of town development and promoting the town development purpose of “government, residents and social capital participation and collaborative sustainable development”, which is an innovation of government-enterprise cooperation mode, enabling the circulation and allocation of production factors and resources in the town to be active, and at the same time, bringing a greater radiation effect to the development of the surrounding areas. At the same time, it also brings a greater radiation effect to the development of the surrounding area, and the participants of the town project each take their own roles to promote the strong development of the town's leading industries based on advanced elements such as talents, capital and technology, while focusing on the harmonious coexistence of the town and the ecological environment, so as to achieve the development goal of “three-life integration” of production, life and ecology. The behavior of the various stakeholders in the town will directly or indirectly affect the development of the town .At the same time, since the construction period of PPP projects in small towns usually takes 5 to 10 years and the investment amount is about 5 billion<sup>[5]</sup>, interests become an important driving force for the active participation of stakeholders in project construction.

##### **3.3.1 Government side**

Small town construction and development need flexible financial and taxation policy support, so that the town can quickly attract funds and talent. In order to encourage social capital parties and town residents to actively participate in the construction and operation of town projects, and to improve the system of coordinated use of funds for the construction of town projects, Jiashan County government has introduced land funding policies and special development incentive policies to encourage the priority of procedures to ensure the index, while building a financial management system, reasonable planning of land, scientific positioning of different themes, locations and development directions . Forming a holistic town project industry, the government and other parties involved in the town project work together to promote the improvement of the investment environment in Jiashan County and even Zhejiang Province, “according to government policies, nurture special industries”, Jiashan chocolate town gradually become a new engine to drive China's economic development.

### **3.3.2 Social Capital Parties**

Grosvenor Group is the main investment, financing, construction and operation body of the Chocolate Town, with strong capital strength and financing ability, which greatly improves the liquidity of the town's PPP project, and signed a PPP cooperation agreement with the Jiashan government, which clearly stipulates the proportion of each party's contribution and the rights and obligations of each party, and establishes a cooperative relationship of benefit sharing and risk sharing. Ltd. In the development and operation stage of the town PPP project, Groupe Groupe de France made use of its excellent business ability and experience in technology innovation and operation management in related fields to accurately screen risks and implement risk control, which significantly improved the success rate of the project. An important prerequisite for the successful implementation of small town PPP projects is that the social capitalists achieve the expected economic returns, and with a series of incentive policies introduced by the government and active supervision by the town residents, the social capitalists of chocolate town PPP projects achieve huge profits and viability. According to the relevant information, the Grosvenor Group plans to invest a total of 900 million RMB and plan to cover an area of 430 mu, with an annual production of 20,000 tons of high-quality pure cocoa butter chocolate and one million visitors every year, and the annual comprehensive income will exceed 2 billion RMB at the end of the plan, which makes the creation of the chocolate town “coincidentally” take advantage of the Grosvenor Group This makes the creation of Chocolate Town “take advantage of” the east wind of Grosvenor Group to further improve the core competitiveness of the town and meet the requirements of the state, province and Zhejiang city to speed up the construction of urban infrastructure and service capacity, which has good economic and social value.

### **3.3.3 Small Town Residents**

Encouraged by the policies promulgated by Jiashan County Government, the residents of the town, as the beneficiaries and participants of the town PPP project, have greatly reduced their production and living costs and have a stronger sense of ownership, and further promote the sustainable development of the town by virtue of their own advantages, such as more than 90% of the residents of the town have been engaged in agricultural production for a long time, and they have acquired certain agricultural knowledge and are familiar with the local climate change pattern. In addition, the residents of the town supervise the government and the social capitalist through the public information of social media. From the previous situation of town residents' participation in town projects, one of the main reasons for town residents not to participate in town projects is that, due to information asymmetry, town residents are worried that their legitimate rights and interests cannot be protected, while each participant of town PPP projects can reasonably protect their own interests by forming a special town development company through PPP agreements. At the same time, the government actively implements the principle of “people-oriented” in the construction of the town, and provides special skills training for the town residents to guide them to participate in the construction of the town, so as to promote the employment of local residents and improve their sense of well-being.



### **3.4 Case Review**

#### **3.4.1 Project Effectiveness**

As the only city in the province listed in the national PPP key cities in the engineering field in 2017, the development of Jiashan Chocolate Town is inextricably linked to the implementation of the PPP project. In terms of its direct economic benefits, the project, when carried out successfully, can add 320 million RMB to the national tax revenue, receive 2.6 million visitors and achieve tourism revenue of 1.3 billion RMB, while providing a large number of jobs for the town's residents, improving the income of the town's residents and driving local economic development. In terms of indirect economic benefits, it gradually improves the surrounding ecological environment and regional infrastructure, enhances the level of public services in the region and the quality of life of the town's residents, and along with the rapid development of the town's PPP project industry, the industrial advantages gradually become the town's economic growth point, while the asset and liability ratio of Jiashan County government is effectively reduced and the financial revenue and expenditure structure is optimized, in line with the spirit of the 20th National Congress, which greatly enhance the external influence of the town.

#### **3.4.2 Experience Summary**

Separation of responsibilities and collaboration: To summarize the failure of PPP project towns at home and abroad: most of the failed towns are completely privatized in the development of PPP projects, and are only “walking around” in the construction and operation of the town, participating only for the purpose of obtaining government subsidized loans and land use rights, but in the Jiashan Chocolate Town In the PPP project of Jiashan Chocolate Town, each participant has its own role and cooperates with each other. The government gives the enterprise independent operation space, and it is only responsible for the infrastructure services of the town based on the introduction of a series of incentive policies. The public facilities outside the enterprise are built by the government of Dayun Town, such as the construction of the city living room project, the planning, design and construction of a series of public service facilities such as the chocolate avenue, the flower avenue, the school, the library, etc., while the social capital party actively plays its With the government's policy incentives, the town residents are more inclined to enter the town for employment nearby, a large number of talents choose to return to their hometown to start their own businesses, and the town residents enjoy a level playing field for development and are more actively involved in supervising the construction and development of the chocolate town.

#### **3.4.3 Project Shortage**

At present, the government adopts a single policy of encouraging subsidies to attract the participation of social capital parties and town residents, which is not conducive to playing the government's regulatory policy on small town PPP projects and will, to a certain extent, reduce the formation of market competitiveness of social capital and town residents in small town PPP projects, and may induce such behaviors as fraudulent subsidy speculation. Moreover, the social capital party of the town PPP project is too single, and the single social capital party makes the project lack of flexibility, which will cause the town to lose the development opportunity due to the lack of sufficient innovation ability in operation and management, so the operation and management efficiency of the town PPP project is relatively low, and the construction cycle of the special town is long, from the town planning, construction, operation and other aspects need financial support, if Relying on only one social capital party will increase its financial pressure and risk, which is not conducive to attracting social capital parties to join. Secondly, due to the low education level and information asymmetry of most town residents, it makes their supervision and feedback untimely, which damages the participation enthusiasm of town residents.

#### **3.4.4 Conclusions**

After constructing the three-party evolutionary game model of the government, social capitalists and town residents of the special town and the case of Jiashan Chocolate Town PPP project, it is

concluded that when the system evolutionary stabilization strategy is (implement incentive policy, actively invest and participate in supervision), the government, social capitalists and town residents can continue to carry out synergistic collaboration in the future under the premise of maximizing their own interests and not harming the interests of other parties. In addition, the active cooperation and good policy incentives create a good social image for each participant under the supervision of higher authorities and the public, so this strategy is the optimal strategy under this game model. To summarize the experience of the development of the characteristic town, the following suggestions are made to promote the high-quality development of the characteristic town:①The government should adopt a regulatory strategy that combines subsidy and punishment strategies: on the one hand, it should implement incentive policies to enhance the credibility of the government so as to attract the active participation of social capitalists and town residents and broaden the financing channels of the town, and on the other hand, it should implement punishment strategies to restrain its speculative behavior so as to bring greater benefits to the government and reduce the losses to the public.②Expand the monitoring and feedback channels for town residents: timely feedback and monitoring can make government departments and social capital work together to protect the public interest of society and reduce the risk of information asymmetry of participating subjects, and the benefits gained by town residents through active monitoring and feedback will also improve their sense of ownership, thus making town residents actively supervise the whole process of town construction and operation, forming a virtuous circle.

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