The Rural Elite and the Supply of Public Goods in Rural Areas

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Abstract   Based on the theory of collective action and social capital theory, social capital is introduced into the game analysis of the supply of public goods between the rural elite and ordinary villagers. I establish the income model of public goods utility concerning the rural elite and ordinary villagers; research the incentive of social capital for the rural elite and villagers, and impact of social capital on the rural elite and villagers. Three inferences can be drawn from the model: the precondition for the elite to prompt the collective cooperation is having "good reputation"; "good reputation" of the elite in the supply of public goods can abate farmers' motive of "free rider"; the role of the elite in organizing the supply of public goods can save the transaction costs in the process of collective action. Taking the case of Shunhe Village, Panyu District, Guangzhou City, I explain this model. Finally, some policy recommendations are put forth as follows: rebuilding the community credit; giving full play to the role of the rural elite in the supply of public goods in rural areas.

Key words   The rural elite, Public goods, Social capital, Collective action

The urban-rural dual structure of the supply of public goods leaves China's rural public goods in a state of supply shortage and irrational structure, which has become one of the main factors restricting China's rural economic development, and seriously affected farmers' income increase and development of rural areas and agriculture. In order to change the shortage and structural imbalance of supply of public goods in rural areas of China, it is necessary for the villages to be deeply involved in the supply of public goods in rural areas. But there is the problem of collective action plight in reality. The elite are tremendous resources in China's rural areas, and giving play to the role of the elite is an effective way to crack the plight of rural collective action. The role of the rural elite in the self-supply of public goods in rural areas is the role of authority figures in collective action. In-depth discussion of the role of the rural elite in the supply of public goods in rural areas can provide revelation or reference for the other types of collective cooperation under authority. On the basis of previous studies and review, I analyze the functioning mechanism of social capital in the game between the elite and the ordinary farmers, explain the case of Shunhe Village, Panyu, Guangzhou, using the model, and finally put forth the policy recommendations.

1   Literature review

1.1   The current situation of the supply of public goods in rural areas
The supply of public goods in rural areas of China at present is characterized coexistence of insufficient total amount and structural imbalance. Wu Shijian believes that the rural public products supplied insufficiently are mainly the public goods for agricultural production, such as rural water conservancy facilities, and farmland road[1]. The questionnaire survey

of needs for public goods in rural areas of China by Liu Yiqiang shows that farmers' demand for public goods is not met generally, which proves insufficient supply of public goods in rural areas of China[2]. Imbalance of public goods in rural areas refers to the coexistence of excess and shortage of supply of public goods in rural areas. Li Dasheng's studies have shown that the supply of public goods that some farmers urgently need is insufficient in the long term, such as the irrigation and water conservancy facilities, roads and agricultural science and technology; the supply of some rural public goods seldom needed in rural areas is excess, such as "vanity project" and image project[3]. Qu Yanchun, et al. analyze the reason for this phenomenon, and they believe that it is mainly caused due to insufficient national financial input and "top-down" decision-making mechanism[4]. The financial input to the supply of public goods in rural areas is insufficient. On the one hand, the share of national financial expenditure used for agriculture in total national financial expenditure shows an overall downward trend; on the other hand, the financial transfer payment is not enough. Zhao Chunjiang thinks that in-depth participation of the village as the demand subject of public goods is an important way to solve the insufficient supply of public goods in rural areas and the structural imbalance[5]. The village's participation in the supply and use of public goods is an objective requirement, but there is plight of collective action in practice, namely serious shortage of public goods, excessive use and collective decision-making difficulties, therefore, it is necessary to establish the trust mechanism. Using the prestigious elite in rural areas to participate is an effective way to solve the plight of collective action.

1.2   Elite research review
The word of "elite" first appeared in France in the 17th century, whose original meaning was "the best part of annual harvest", and converted meaning is "the qualifier after the selection"[6]. With deepening of the studies on rural problems, many domestic scholars introduce

the concept of elite into the studies on rural problems, and define the concept of the rural elite from their own research perspectives. Quan Zhihui calls those people who can mobilize more social resources and get more authoritative values than other members the elite in association practice of small groups[7]. In the research on the relationship between the elite in rural areas and the governance of the rural communities, He Xuefeng believes that the rural elite are the influential people in the village[8]. There are also many scholars defining the rural elite, and the similarity is that the elite are talented people in the rural communities, making special contributions to rural society, and having a great impact on rural development. The study suggests that the rural elite are those outstanding and competent in rural areas, who have a certain influence on other villagers' behaviors.

On the basis of giving an overview of studies on function of the rural elite, Zeng Fusheng, *et al.* conduct specific analysis of the elite's role of decision-making, financing, production, and regulation in the supply of public goods[9]. Through a case of successfully supplying public goods in rural areas, Li Wu analyzes the " authority phenomenon" in rural collective action. In the communities with rich social capital, the collective action organized by the elite helps overcome the mentality of " free rider" and the tendency of opportunism[10]. Jiao Shaofei believes that there is a positive correlation between the influence of the elite and the output of public goods in collective action[11]. The influence and rallying point of the rural elite are not only associated with economic status, but also related to their social capital, such as personal quality, reputation, prestige, and clan forces. Therefore, the social capital of elite is the key for the rural elite to promote the collective cooperation.

2 Theoretical origin

2.1 Theory of collective action: the plight and progress

Mancur Olson's The Logic of Collective Action: Public Goods and the Theory of Groups is the foundation for the theory of collective action. According to the assumption of individual rationality maximization, Mancur Olson believes that there is " free rider" behavior in the cooperation between large groups, and the collective action will fall into the " prisoner's dilemma". He theorized that " only a separate and 'selective' incentive will stimulate a rational individual in a latent group to act in a group-oriented way"; that is, members of a large group will not act in the group's common interest unless motivated by personal gains (economic, social, *etc.*)[12]. He specifically distinguishes between large and small groups, the latter of which can act simply on a shared objective. Large groups, however, will not form or work towards a shared objective unless individual members are sufficiently motivated.

Different from the conclusions of Olson's theory of collective action, the collective cooperative actions in reality are common. For this, using the Folk Theorem, the strategy of " tit for tat", strong reciprocity hypothesis and reputation income in the game theory, the foreign scholars correct the theory of collective action. Based on this, the domestic scholars research the motivation and mechanism of collective cooperation of the do-

mestic industry associations from the reputation mechanism and role model demonstration mechanism.

Zhu Linke establishes the role model demonstration mechanism to explain the problems of collective action in the industry. He believes that the premise for the functioning of role model demonstration mechanism is that there should be at least one leader, and the existence of this leader depends on the honor, the pursuit of self-realization and other incentive mechanisms[13]. On the basis of economic analysis of collective action, Jiao Shaofei uses heterogeneity hypothesis to analyze the impact of rural influential members on collective action. Heterogeneity means that the large members in the group can obtain higher utility than small members in the same public goods, and the large members can influence other members[11]. Hu Yongjun, *et al.* follow the idea of the heterogeneity analysis in the theory of collective action, to further analyze the functioning mechanism of the rural elite in the self-supply of public goods in rural areas based on " acquaintance society", using the utility function of rural elite and ordinary members[14].

The above studies can explain the collective action to a certain extent, but they are based on the heterogeneity assumption model, ignoring the role of social capital in the collective action, and they fail to well explain the mechanism of the rural elite in abating other members' free-rider motivation.

2.2 Social capital: adhesive of collective action

In 1980, the French sociologist Pierre Bourdieu put forward the innovative concept of social capital, and fully proved that the relationship, as " credential", is the resource that can create value[15]. Since then, the American scholar Robert. D. Putnam unified the factors responsible for difference in the system performance using the concept of social capital, and defined the social capital as the characteristics of social organizations, such as trust, norms and network, which can improve the efficiency of society through the promotion of cooperative behavior[16]. It can be seen from the previous analysis that social capital is the capital, a kind of resource that can create value. Social capital is the trust, norm and network that can promote mutually beneficial cooperative action. In fact, it is a lubricant for collective cooperation. The study defines the social capital as the resource that exists in social network, helping individuals to affect the behavior of others.

In terms of the subject of social capital, social capital can be divided into the social capital personally owned; organization's social capital (enterprises' social capital); the entire community's social capital. In *Making Democracy Work: Civic Traditions in Modern Italy*, Putnam interprets the role of community's social capital in collective action. He believes that dense network of social interaction and the binding mechanism of voluntary associations, will reduce phenomena of opportunism behavior and " free rider", easily produce public opinion and other modes conducive to building up the reputation, which are the necessary foundation for the establishment of trust relationship and credit society[16].

Ding Huanfeng maintains that through investment in trust, norms, networks, social relations and other forms, social cap-

ital helps the subject to obtain some kind of scarce resources, to achieve the purpose of improving efficiency[17]. In the collective action, the motivation of the elite not only depends on the pure comparison between personal benefits and costs, but also hinges on the gains from investment in social capital. The elite organize and participate in the community's collective cooperation, to obtain additional material benefits, prestige, social status, honor and other kind of personal social capital from the social relations in the entire community; it is the existence of these additional benefits that makes the elite have a strong motive for participating in the organization, even with some kind of degree of altruism. As Liu Dezhong has said, "After they get rich, they assume the important task of building farmers' economic cooperative organization, in order to seek the increase in value of their own social capital."[18]. And the people who enjoy good cooperation credibility and reputation, will take having more credibility and reputation as an incentive. Thus in the supply of public goods, the elite not only have individual utility income, but also have social capital gains.

Social capital is the accumulation of reputation, and also a way to select reputation. The reason why the rural elite invest in the reputation of "honesty" in the repetitive transaction, is that it can replace some resources and save some resources, reducing transaction costs in the transaction. The essence of the "prisoner's dilemma" is that individual rational strategies lead to collective irrationality, opportunistic behavior and the "free rider" behavior lead to the failure of cooperation. Trust in social capital can create an opportunity of buying or selling on credit, reflecting "obligation and expectation" in interpersonal relationship, that is, I make contribution for you and I have credit for you, you have an obligation of requital. Such kind of "favor" is a kind of "sense of obligation", and "owing" indicates that I have a wish of requital[19]. The elite's social capital investment means more payment, in exchange for more obligations and expectations, making them become creditors with more "obligations". When the rural elite with social capital organize the supply of public goods, in view of the needs of investment in social capital, the rural elite will pay more than the ordinary farmers, and the obligation of requiting the elite will form in the heart of ordinary farmers. Such mentality of requital effectively abates the ordinary farmers' opportunism and "free rider" motivation in the supply of public goods, improving farmers' level of participation.

China's rural areas are established on the basis of consanguinity, geological relationship and occupation relationship; people are linked through a variety of relationships, forming myriad networks of relationship and social networks in rural areas. The rural community is regarded as "acquaintance society", where people have common preferences, traditional morality, sense of belonging, common norms, practices, and customs. It has the foundation for producing relationship of trust and social capital. Under "acquaintance society", I analyze the interaction between the rural elite and the ordinary farmers with social capital as a link, in order to find a way to make the villages break through "prisoner's dilemma".

3 The model analysis of the rural elite's role in promoting the supply of public goods in rural areas

3.1 The model assumptions

(i) Each villager in the community is economic man, maximizing his own utility. The villagers' utility is from two parts: private goods and public goods. The villagers' currency is only used for private goods and public goods. The rural elite's income includes the utility of public and private goods, and social capital income. By participating in the community's collective action, the rural elite obtain the additional social capital income from the entire community's network of social relations, such as reputation, social status, and honor.

(ii) The villagers in the community can not estimate their lifespan, and the members expect that the collective cooperation will not halt within the period of life. In the community, the villagers' information is symmetrical and within the scope of trust. In the community, the villagers are in the network of relationships, who can be aware of the real behavior each other.

(iii) Decision-making of ordinary farmers interacts with that of the rural elite. The ordinary farmers observe the rural elite's behavior in the past intercourse, to assess the action that may be taken by the rural elite, and then decide on their own behavior. Therefore, if the rural elite keep trustworthy cooperation ("good reputation") in the previous game, it can guide the ordinary farmers to cooperate with them. At the same time, this will prompt the rural elite to adopt cooperation in order to get "good reputation" when dealing with ordinary farmers (even if the intercourse with this person is short-term and one-time), because those persons with "bad reputation" will get the punishment of no other person to cooperate with them.

(iv) The rural community consists of $n + 1$ members, of which there is only one elite, with resource endowment of M_o. Another n members are homogeneous ordinary members, and the resources endowment is M_i.

(v) The rural elite are the organizers and sponsors of the supply activities of public goods, who first advance the idea of supplying public goods by cooperation, and promise to spend E_o. Ordinary farmers determine their actions according to the rural elite's commitment. The ordinary farmers' participation, in turn, will affect the real expenditure of the rural elite. If the ordinary farmers' participation is not enough, the rural elite will reduce their expenditure, thereby reducing the participation of ordinary farmers, and finally making the supply of public goods misfire; if ordinary farmers take concerted action with the rural elite, the rural elite will spend in accordance with commitment, and ultimately the supply of public goods will be successful.

(vi) The total amount of public goods is the sum of all members' payment amount.

3.2 The rural elite utility function

(i) The rural elite's acquisition of social capital income R depends on the output of public goods and farmers' participation, and is proportional to both. Assuming that Eo represents the elite's expenditure on public goods; E_i represents farmer i's

expenditure on public goods; $\sum\limits_{i=1}^{n} E_i$ signifies farmers' participation. Thus we can get the function of income $R = f[\sum\limits_{i=1}^{n} E_i$, $\ln(E_0 + \sum\limits_{i=1}^{n} E_i)]$. To simplify the analysis, we assume that:

$$R = \sum\limits_{i=1}^{n} E_i \quad \ln(E_0 + \sum\limits_{i=1}^{n} E_i)$$

(ii) We use the C – D function to build the elite's utility. M_o represents the elite's total money income; E_o represents the elite's expenditure on public goods; α_0, β_0 signify the elite's preference coefficient on the private goods and public goods; $(M_0 - E_0)$ signifies expenditure on the private goods; $\alpha_0 \ln(M_0 - E_0)$ signifies the elite's utility of the private goods; $\beta_0 \ln(E_0 + \sum\limits_{i=1}^{n} E_i)$ signifies the elite's public goods utility function. The specific form of the elite's goods utility function is as follows:

$$U = \alpha_0 \ln(M_0 - E_0) + \beta_0 \ln(E_0 + \sum\limits_{i=1}^{n} E_i) \quad 0 < \alpha_0, \beta_0 < 1, \alpha_0 + \beta_0 = 1$$

(iii) Assuming that the weight ratio of the elite's general utility to the elite's social capital income is $1:\psi$. Thus the elite's utility is equal to $U + \psi R$, and the functional form is as follows:

$$\alpha_0 \ln(M_0 - E_0) + \beta_0 \ln(E_0 + \sum\limits_{i=1}^{n} E_i) + \Psi \sum E_i \ln E_0 + \sum\limits_{i=1}^{n} E_i$$

Using the optimal condition $d(U + \Psi R)/dE_0 = 0$, we derive the following expression:

$$E_0 = \{M_0 \beta_0 - \alpha_0 \sum\limits_{i=1}^{n} E_i + \sum\limits_{i=1}^{n} E_i M_0\}/(1 + \Psi \sum\limits_{i=1}^{n} E_i)$$

The results show that the elite's optimal payment is proportional to M_o and β_o, inversely proportional to α_o. For the impact of $\sum E_i$ on the elite's optimal payment, it is difficult to directly get from the results, but the impact can be derived through two extreme cases. When the elite has no social capital income, the elite's utility function is as follows:

$$\alpha_0 \ln(M_0 - E_0) + \beta_0 \ln(E_0 + \sum\limits_{i=1}^{n} E_i)$$

After the optimization solving, the optimal payment $E_0 = M_0 \beta_0 - \alpha_0 \sum\limits_{i=1}^{n} E_i$. Because the public goods are non-exclusive, $\sum\limits_{i=1}^{n} E_i$ is inversely proportional to E_o. When the elite has no utility of public goods, or non-exclusiveness does not exist, the elite's utility function is as follows:

$$\alpha_0 \ln(M_0 - E_0) + \Psi \sum E_i \ln(E_0 + \sum\limits_{i=1}^{n} E_i)$$

After the optimization solving, the optimal payment $E_0 = \dfrac{(\Psi M_0 - \alpha_0)}{[\Psi + (\alpha_0 / \sum\limits_{i=1}^{n} E_i)]}$.

When there is only social capital income and private goods utility function, $\sum\limits_{i=1}^{n} E_i$ is proportional to E_o. Therefore, in the actual model, $\sum\limits_{i=1}^{n} E_i$ is the integration of "free rider" and social capital income's incentive role.

3.3 The ordinary member utility function

(i) In accordance with the model assumptions, similarly we use C – D function form to analyze farmers' utility experience. Farmers' utility function is composed of public goods utility and private goods utility.

M_i is farmer's total money income; $\sum\limits_{m=1}^{n} E_m$ is the expenditure of all other farmers except farmer i on public goods. It is noteworthy that farmer i's public goods utility is $\beta_i \ln(\sum\limits_{m=1}^{n} E_m + E_i)$. The specific form is as follows:

$$U = \alpha_i \ln(M_i - E_i) + \beta_i \ln(\sum\limits_{m=1}^{n} E_m + E_i), 0 < \alpha_i, \beta_i < 1, \alpha_i + \beta_i = 1$$

(ii) According to the farmers' backward – looking decision-making model, the rural elite's "reputation" V encouraging farmers' cooperation depends on the rural elite's payment E_o, and the farmers' expectation of the elite B based on the previous transaction, $V = f(E_0, B)$.

When the rural elite's actual payment is greater than the farmers' expectation, namely $E_o > B$, V is "good reputation", $V = \ln(E_0/B)$. The rural elite's payment makes the farmers have the obligation of return, thereby enhancing the ordinary farmers' preference for public goods.

Thus farmer i's utility function form is as follows:

$$U = \alpha_i \ln(M_i - E_i) + \beta_i \ln(\sum\limits_{m=1}^{n} E_m + E_i) + \ln(E_0/B) \ln(\sum\limits_{m=1}^{n} E_m + E_i)$$

Using the optimal condition dU/dE_i, we derive the following expression:

$$E_i = \{M_i \beta_i - \alpha_i \sum\limits_{m=1}^{n} E_m + [\ln(E_0/B) M_i]\}/[1 + \ln(E_0 + B)]$$

Or $Ei = M_i - \dfrac{\alpha(M_i + \sum\limits_{m=1}^{n} E_m)}{[1 + \ln(E_0 + B)]}$.

The results show that farmer i's optimal payment is proportional to M_i and β_i, inversely proportional to α_i.

$V = \ln(E_0/B)$ is also proportional to the optimal payment. The more the elite pay, the more the individual farmers pay.

When $E_o < B$, V is "bad reputation". V affects the farmers' preference for public goods, and the elite's behavior has no additional incentive for the ordinary farmers.

Thus farmer i's utility function form is as follows:

$$\alpha_i \ln(M_i - E_i) + \beta_i \ln(\sum\limits_{m=1}^{n} E_m + E_i)$$

Using the optimal condition $dU/dE_i = 0$, we derive that:

$$E_i = M_i \beta_i - \alpha \sum\limits_{m=1}^{n} E_m$$

From the results, we know that farmer i's optimal payment is proportional to M_i and β_i, inversely proportional to α_i. When there is no additional incentive, due to the non-exclusiveness of public goods, farmer i's payment in the public goods is reduced.

3.4 The model inference
Inference 1 The prerequisite for the elite to promote the collective cooperation is to have a "good reputation".

In the model, assuming that the factor influencing farmers' backward-looking decision-making model is V, from the results, only V plays the incentive role can the elite pay a role in contributing to the collective cooperation. When V does not exist, farmer i's optimal payment is as follows:

$$E_i = M_i \beta_i - \alpha \sum\limits_{m=1}^{n} E_m$$

$\sum\limits_{m=1}^{n} E_m$ is inversely proportional to E_i. The other people's payment reduces farmer i's payment, and there is "free rider" behavior in collective action. At the same time, decline in the farmers' participation will reduce the elite's social capital in-

come, thereby reducing the elite's payment, ultimately making the supply of public goods mired into the prisoner's dilemma.

This means that having great wealth does not play a key role in the elite's public goods, and the elite's " good reputation" is the core contributing to collective cooperation. For the elite such as village cadres or wealthy households, to play a role in the supply of public goods, it is necessary to establish credibility, and enhance reputation.

Inference 2 The elite's " good reputation" in the supply of public goods can abate farmers' motive of " free rider"

When V exists, farmer i's optimal payment is as follows:

$$M_i - \frac{\alpha(M_i + \sum_{m=1}^{n} E_m)}{[1 + \ln(E_0/B)]}$$

When $V = \ln(E_0/B)$ increases, the coefficient of elasticity of $\sum_{m=1}^{n} E_m)$ for E_i is reduced, and the role of " free rider" is abated.

The role of rural elite's " good reputation" in the collective cooperation is the manifestation of trust in social capital abating the ordinary farmers' " free rider" motivation. At the same time, it is also the elite's role of exemplary mechanism. The rural elite are the central figure in the rural areas, and the ordinary farmers admire the elite, with the characteristics of following and imitating the elite. When the rural elite establish a fair, trustworthy, and selfless image in the supply of public goods, other farmers will also act in accordance with this standard, thereby reducing the free-rider motivation of the farmers in the supply of public goods.

Inference 3 The elite play an organizational role in the supply of public goods, which can save the transaction costs in the process of collective action.

Transaction cost is the cost produced in interpersonal trading, including the cost for achieving the contract and the cost for monitoring. In one community, the communication between the atomized members is difficult or there is no communication at all, and high organizational costs will be paid for organizing the members, thereby making the collective action is difficult to reach. In life, when the members transact business with each other, the members with " good reputation", great capacity or social capital, be given some authoritative value. As is shown by the theoretical model, all members are willing to trade with the elite with " good reputation", and willing to obey the elite's mobilization, therefore, the elite, working as the organizers, can reduce the transaction costs of communication and reaching an agreement in the process of collective action.

4   Case study-taking the case of Shunhe Village, Panyu District, Guangzhou City

4.1   The current situation of public goods in Shunhe Village   Shunhe Village is located in the east of Ganlan Town, Panyu District, Guangdong Province. The village has a land area of 324 hm², and a population of residence booklet at about 3 000. The village is a typical agricultural village, with crop farming as the main body. Shunhe Village focuses on the construction of agricultural infrastructure and agricultural production

demonstration base, and vigorously promotes greenhouse cultivation and drip sprinkler irrigation techniques. In order to broaden the sales channels of farm and sideline products for villagers, the villagers build the wide paths for tractors in the village collectively. In addition, it has established sound maintenance mechanism.

The agricultural production in Shunhe Village is mainly based on scattered farmers' individual operation, with small production scale and single production mode. This mode of operation is not sensitive to the market, with weak ability to resist natural disasters and bargain, making it difficult for the farmers to increase income. The agricultural production in Shunhe Village is facing need to translate to cooperative operation.

4.2   The lack of elite   The traditional definition of elite includes the village branch secretary, the village head and other political elite. The village branch secretary and the village head in Shunhe Village, held by the same person, who has worked for 22 years in Panyu's grass-roots unit, having a good mass base and good rallying point, is the elite in the village. By visit and learning in the agricultural production bases elsewhere, the village head has realized the advantage of cooperative agricultural production and operation, and believed that the establishment of cooperatives is an important way to enhance the ability to withstand risks.

Although the village head has realized the necessity of establishing agricultural cooperatives, he does not help to establish cooperatives. For this, the village head gives the following reasons. First of all, stability work in rural areas at present has occupied most of the time and energy of the village cadres. Secondly, farmers' awareness of cooperation is weak, and the mutual trust between farmers and government is not enough, thus it is difficult to achieve cooperation. Farmers are short-sighted, satisfied with a small wealth, with small farmer consciousness. In addition, in recent years, there are few natural disasters, agricultural products are marketable and farmers' income is stable in Shunhe Village. The reality abates the farmers' need for the cooperative operation. Finally, the village head believes that he is old and his work energy is limited, unable to organize the cooperatives.

The village head also mentioned the ideal people for completing the establishment of cooperatives. He believes that there is a shortage of talents in rural areas, and rural cadres also present the characteristics of aging, thus the knowledgeable, enthusiastic and creative young talents are urgently needed for the rural development.

4.3   Case explanation   The construction of rural cooperatives in Shunhe Village lags behind, one the one hand, arising from low mutual trust between villagers; on the other hand, from the lack of the elite. Guangdong is in the period of rapid economic development and social transition, and market economy has a great impact on people's original concept. Income growth and increase in materials make farmers become independent, which undermines the traditional clan kinship and blood relationship. At the same time, the individual acts of corruption in the government also lower the credibility of the government departments. As is put by the village head of Shunhe

Village, only when the government offers subsidies to villagers can the villagers' misgiving be dissipated to participate in various kinds of skills training organized by government. Declined credibility of the government departments also abates the " reputation" of the village head as the representative of public authority, making the villagers remain vigilant over the supply of public goods organized by the government, which hampers the villagers' collective cooperation. As is shown by the model, when V is decreased, the total supply of public goods will be reduced, which may even lead to the failure in the supply of public goods.

In general, the establishment of rural cooperatives is often driven by the experience of one certain big economic household. Due to limitation of the vision of the villagers, the villagers are difficult to realize the benefits and necessity of the agricultural cooperation. However, when there are successful examples around the villagers, they can truly feel the benefits, and their recognition of cooperatives will be increased. Due to the reputation mechanism and model demonstration, the typical successful people organizing rural cooperatives, can make the villagers realize the necessity and importance of establishing cooperatives for cooperation, and increase villagers' participation, conducive to facilitating collective cooperation, and reducing difficulty in the supply of public goods.

5 Policy recommendations

These studies have shown that the social capital of the elite within the village is the key for the village to reach collective action; the social capital can abate the free-rider motivation and reduce transaction costs, thereby increasing the output of public goods. The policy implications of this conclusion are as follows:

5.1 Rebuilding the community credit In order to solve the current shortage of public goods in rural areas, it is necessary to increase social capital in rural areas. Especially after the reform and opening-up, the original clan kinship in rural areas is weakened, and the new authority has not yet been established, the rebuilding of community credit becomes very important.

First, it is necessary to build transparent village committee and build honest role model. The village committee is a legitimately elected authority body, responsible for the management of various aspects in rural areas. As the largest authority body, the village committee's behavior has a profound impact; fair and transparent village committee is conducive to the generation of social capital in the village.

Second, it is necessary to establish institutionalized public participation platform, unblock channels of communication, and

improve the democratic decision-making mode; deepen and advance the existing villagers' congress in rural areas, to enhance the villagers' sense of ownership, and promote awareness of the villagers to participate in social affairs.

Third, it is necessary to use the culture in the village to construct a new socialist countryside fashion.

5.2 Giving full play to the role of the rural elite in the supply of public goods in rural areas In order to play the role the rural elite in the supply of public goods in rural areas, the incentive mechanism of public goods must be improved. Public goods can play an important role in rural social and economic development, thus we should put the responsibility of increasing the supply of public goods in a more important position. Currently, too much emphasis on the stability work affects the work of village cadres. The community should pay attention to the supply of public goods, and give material or spiritual reward to the rural elite who play an important role in the supply of public goods, which can encourage the rural elite to play a greater role in the supply of public goods.

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