



# Research on Policy Implementation of Government Purchasing Environmental Public Services

## Based on the Analysis of Tripartite Cooperation and Confrontation Strategy

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**Abstract.** The current supply mode of environmental public services is dominated by government purchases. However, in the process of the government purchasing environmental public services, there are still many competing interests. Therefore, this paper focuses on policy implementation, comprehensively uses game theory and marginal theory, and discusses the interest game and coordination relationship among the three parties involved in the supply process of environmental public services, including the government, enterprises and the public. The study found that in the process of policy implementation, governments are more likely to reach a cooperative equilibrium with enterprises, forming a stable “rent-seeking” state, resulting in the loss of public welfare.

**Keywords:** Environmental Public Service · Government Procurement · Policy Implementation · Game Theory · Multiple Subjects

## 1 Introduction

In the 1970s, countries such as Europe and the United States set off a new public management movement, with the core connotation of reducing the pressure on government management and undertaking public services through social forces. In 1994, China carried out relevant practices in Luohu District, Shenzhen, and established a non-governmental organization form engaged in the provision of environmental public services. It took the lead in carrying out simple market-oriented reforms in urban environmental sanitation, such as urban garbage disposal and urban greening, and achieved good governance results. Under the general trend of the separation of the responsible subject and the supplying subject of environmental public services, in-depth research on the policy implementation of government procurement of environmental public services, It is not only conducive to further enriching and improving the theoretical basis for the implementation of the government’s purchase of environmental public service policies, but also to expand the theoretical research perspective of the implementation of the government’s purchase

of environmental public service policies. It is also conducive to optimizing the environmental public service process, building an ecological service-oriented government, deepening the reform of government procurement of public services, and promoting the modernization of the national environmental public service governance system and governance capabilities.

## 2 Literature Review

Influenced by the new public management theory, providing public goods to the society through government purchases has become a relatively mainstream way of supplying public goods. Theoretical writings in the 1970s and 1990s strongly supported the privatization of public services, including environmental public services, for example, Morgan [1] pointed out that when public services are monopolized by politicians or bureaucrats, the supply of public services will produce excess or low efficiency. However, comprehensive privatization has not been proved to be the most efficient way of supply in subsequent practice, but has aggravated the unfairness of social public service distribution. Subsequently, scholars such as Warner & Hefetz [2], Silvestre [3] began to reflect on the role of the government in the supply of public services. They pointed out that the simple dichotomy of purely relying on market delivery or public planning should be abandoned, and the cooperation between the government and social forces is a more efficient way of supply. Such viewpoints have profoundly influenced the main practices of current public service supply, especially in the field of environmental public services. Lindfors [4] believes that the government still lacks easy-to-use tools for purchasing environmental public services, so it combines life cycle assessment data with national environmental goals and develops a set of public procurement tools. At the same time, relevant research also places special emphasis on the research on the subject relationship in the government purchase process. For example, Lazaroiu et al. [5] advocated the establishment of a cooperative and integrated coalition government, especially emphasizing the conclusion of contracts between the government and private service providers.

Back in the Chinese context, under the combined influence of the historical label of “all-powerful government” and the contemporary requirement of “modernizing governance capacity and system”, Chinese research on the implementation of government purchase of environmental public services has gradually focused on the “cooperation of multiple subjects” in the purchase process. For example, Dong Yurong [6] discussed the rights and obligations of stakeholders in the legislative process of government purchase of environmental public services from the perspective of rule of law construction, based on the preliminary organizational preparation; Sun Yuxia [7] analyzed the various risks arising from the information asymmetry situation of each participant from the perspective of information disclosure, and pointed out the need to strengthen information transparency and information sharing in the purchasing process; Wang Yuanyuan [8] discussed the public’s evaluation of three different ways of undertaking the project through an experimental study of internal agencies of the EPA, enterprises and non-profit organizations.

In the context of multi-subject collaborative governance, there is a lack of discussion on the relationship between multi-subjects, collaborative governance is only at

the countermeasure level, and a series of problems still exist, such as the characteristics of multi-subject participation that have not been systematically applied within the framework of the overall execution process. Using scientific perspectives and analytical methods to connect multiple subjects and explore the motives of multiple subjects' strategic behaviors, there is still room for expansion. Therefore, this paper chooses the implementation process of government procurement of environmental public services as the research object, digs into the implementation deviation in the process of policy implementation, and promotes the government's procurement of environmental public service policies to play its due role at the execution end.

### 3 Analysis of the Implementation Behavior of Government Policy on Purchasing Environmental Public Services

The policy implementation of the Chinese government's procurement of environmental public services involves multiple participants. According to the nature of the government's procurement of environmental public services, it is basically divided into three categories: the government, contractor, and the public. Among them, the government is the main system and policy implementation body, the supply organizations of various environmental public services are the policy implementation objects, and the residents, as the beneficiaries of the actual purchase implementation activities, also participate in specific implementation activities. As shown in Fig. 1.

It can be seen that the government's purchase of environmental public services is a complex management activity involving multiple subjects. According to the interest relationship of the government purchasing environmental public services, the purchaser (Government) assumes the responsibility of providing public services to the society, the contractor (Enterprise) is the direct service provider, and the main beneficiaries of environmental public services are residents. Affected by the public nature of environmental public services, governments are the main purchasers, but the benefits of environmental services are carried out by the public [9, 10]. Therefore, in the field of environmental public services, service buyers and beneficiaries are objectively separated. Various subjects interact with each other in different stages, have different interests, and play

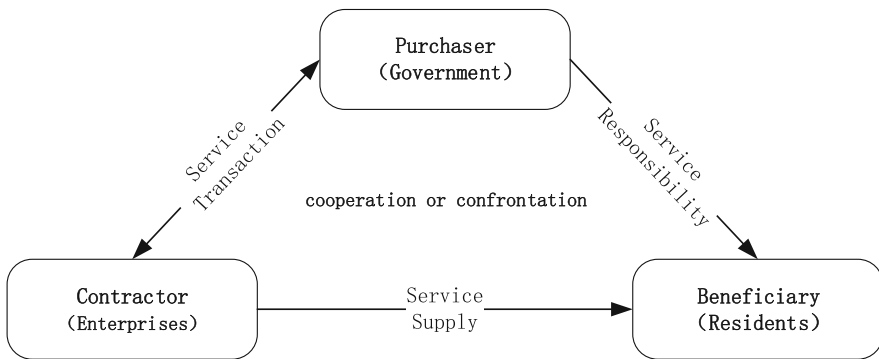


Fig. 1. Policy implementation analysis model

different roles, which affect the implementation effect of government procurement of environmental public services.

### 3.1 Tripartite Utility in Purchasing Activities—Benefit Analysis

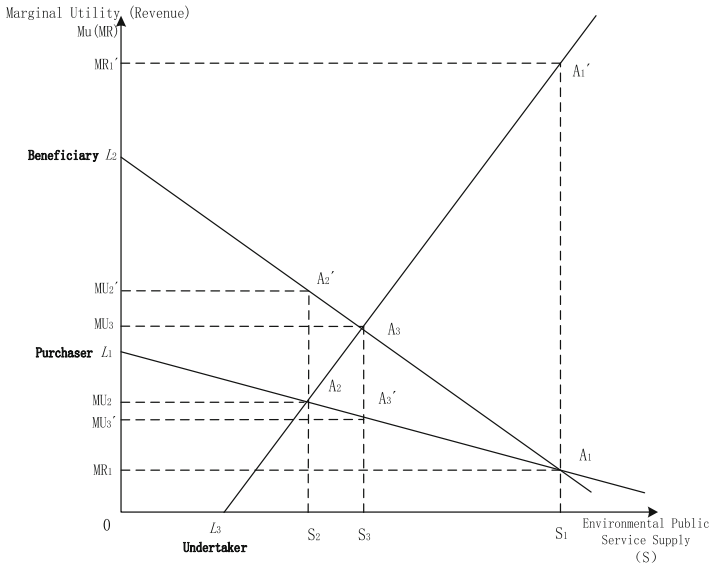
When discussing the utility-income of a certain type of product, the marginal utility or marginal revenue in the marginal theory is usually used, that is, the satisfaction (profit gain) that the supply of a unit product can be the object. From the perspective of management by objectives, the focus of the three main stakeholders is different, resulting in the behaviors of the three parties in specific activities also have their own preferences. According to the principle of diminishing marginal benefits and the characteristics of the environmental service industry, by analyzing the changes in the utility of different subjects for increasing environmental public services, the marginal utility (beneficiary) function of the purchaser (local government), the undertaker and the beneficiary is obtained as:

$$\begin{cases} MU_p = a_1S + b_1 + \mu \\ MU_b = a_2S + b_2 + \mu \\ MR_c = a_3S + b_3 + \mu \dots a_3 > 0 > a_1 > a_2 \end{cases}$$

where  $MU_p$  is the purchaser marginal utility function,  $MU_b$  is the beneficiary marginal utility function,  $MR_c$  is the contractor marginal revenue function, and  $a_1$ ,  $a_2$ , and  $a_3$  represent the tripartite subject marginal utility (revenue) and the sensitivity between the supply of environmental services  $S$ . Since,  $\mu$  is the linear regression bias,  $b_1$ ,  $b_2$ , and  $b_3$  are external variables that trigger the change in marginal utility and are not closely related to this study, they are not discussed too much here. The marginal utility (revenue) curves of the three stakeholders, as shown in Fig. 2.

L1 is the purchaser marginal utility curve, L2 is the beneficiary marginal utility curve, and L3 is the contractor marginal utility curve. Firstly, under the purchaser's perspective, government purchase is only a form of government supply of environmental public services, and government are still responsible for substantive public service supply and have the responsibility to ensure the effective supply of public services, and the long-term social benefits brought by environmental public services are their main consideration. At the same time, the elasticity of the marginal utility brought by the purchase of environmental public services for purchaser is weaker compared to the higher revenue perception of beneficiary. The decrease in utility per unit increase in the supply of environmental public services by purchaser is less, and the marginal revenue and supply curves of environmental public services are flatter. Therefore, combined with the law of decreasing marginal utility, it is known that  $a_1 < 0$  and  $a_1 > a_2$ , which shows the trend of L1 curve in Fig. 2.

Secondly, under the beneficiary perspective, the public, as the direct beneficiary of environmental public services, participates less in specific purchasing activities, and usually participates in the process of government purchasing environmental public services by participating in activities such as hearing, evaluation, and supervision. However, because the public has more intuitive feelings about the environmental conditions around them and favors the expression of subjective feelings, beneficiaries pay more attention



**Fig. 2.** Marginal Utility (Revenue) Curve of Environmental Public Service Purchaser, Contractor and Beneficiary

to the immediate environmental conditions and the current benefits of their own lives during the whole activity process, and their sensitivity to changes in marginal utility is significantly higher than that of purchaser, which has a steeper decreasing trend of marginal utility. Therefore, combined with the law of diminishing marginal utility, it is known that  $a_2 < 0$ , and from the beneficiary’s point of view, it is once again proved that  $a_1 > a_2$ , which is shown in Fig. 3 as the trend of  $L_2$  curve.

Finally, from the perspective of a contractor, whether the contractor is a business or a social organization, the focus of its attention is on the profitability of the project. At the same time, from the perspective of the industrial characteristics of the environmental service industry, it does not follow the strict law of decreasing marginal revenue, because the environmental public service industry favors knowledge and technology factor inputs, and the increase in cost brought by the increase in supply is lower than the increase in revenue, so that the revenue increased by increasing one unit of product supply is increasing, so the marginal revenue of the contractor is increasing, i.e.,  $a_3 > 0$ , which is shown in Fig. 2 as the development trend of  $L_3$  curve.

**3.2 Tripartite Strategy Selection in Buying Activities**

According to the trend of marginal utility (benefit) changes of the three interested parties in the purchasing activities, it can be seen that there are different behavioral strategies of each interested party in the actual purchasing activities of government purchase of environmental public services, and the different behavioral strategies are influenced by the cooperative relationship, which further form five different cooperative postures, as shown in Table 1.

**Table 1.** Tripartite cooperation-adversarial strategy behavior of environmental public services

Strategic Behavior	Tripartite Cooperation	Tripartite confrontation	Purchaser and Beneficiary partner	Contractor and Purchaser partner	Contractor and Beneficiary partner
Point	$A_1 = A_2 = A_3$	$A_1, A_2, A_3$ are not available	$A_1$	$A_2$	$A_3$
Strategy Results	Cooperation	Confrontation	Supervision	Rent seeking	Profit seeking
Status Nature	Direction of reform	Temporary presence	Permanent presence		

Situation 1. When the purchaser, the beneficial and the contractor form a cooperation, the marginal utility of the purchaser is equal to the marginal utility of the beneficial and the marginal revenue of the contractor:

$$MU_p = MU_b = MR_c$$

That is, the three points of  $A_1$ ,  $A_2$ , and  $A_3$  are integrated into one, and the three parties reach an agreement. There is no marginal utility (revenue) loss for any party, and the interests of all parties are coordinated. In theory, Pareto optimality is achieved. The entire purchase activity can not only plan the long-term goals that the government cares about, but also make the public feel the obvious improvement of the environmental conditions in a short period of time. At the same time, the government is subject to systematic supervision during the implementation process, and the collusion caused by policy flexibility is effectively avoided. Instead, through open and transparent multi-party consultation, the government and the public can reach an understanding of the enterprise, and the enterprise's income can also be effectively guaranteed. Therefore, realizing the consensus among purchaser, contractor and beneficiary and maximizing the overall social benefits is the main development direction for the Chinese government to purchase environmental public services.

Situation 2. When the purchaser, benefit and contractor cannot form cooperation, the marginal utility of the purchaser is not equal to the marginal utility of the benefit and the marginal revenue of the contractor:

$$MU_p \neq MU_b \neq MR_c$$

That is, the three points  $A_1$ ,  $A_2$ , and  $A_3$  do not exist, and the three parties cannot reach an agreement, and the loss of marginal utility (income) tends to be infinite. It shows that the purchaser, contractor, and beneficiary cannot reach an agreement, and all parties are against each other, sticking to their own goals, and cannot achieve cooperation.

Situation 3. When the purchaser only cooperates with the beneficiary, that is, the marginal utility of the purchaser is equal to the marginal utility of the beneficiary:

$$MU_p = MU_b \neq MR_c$$

At the level of contractor marginal revenue  $MR_1$ , the cooperation point  $A_1$  between the purchaser and the beneficiary is formed, and the resulting supply of environmental public services is  $S_1$ , and at the level of  $S_1$  supply, the marginal revenue that the contractor should obtain is  $MR_1'$  corresponding to  $A_1'$ , so, the contractor actually generated a marginal revenue loss of  $MR_1' - MR_1$ . At this time, the entire purchase activity will focus on the intersection of the purchaser and the beneficiary goals, forming a high degree of attention to the quality of public services in the specific environment, and then forming a high-intensity supervision of the contractor's behavior. Under this kind of strong supervision, the contractor will cause a loss of efficiency and indirectly compress its profit space. This also explains that most of the projects that the contractor participates in are non-basic public services that meet the needs of enterprises, such as hazardous waste disposal, third-party online monitoring, and wastewater treatment in industrial parks. There is relatively little participation in basic public service areas such as public land restoration.

Situation 4. When the purchaser only cooperates with the contractor, that is, when the marginal utility of the purchaser is equal to the marginal revenue of the contractor:

$$MU_p = MR_c \neq MU_b$$

At point  $A_2$ , the cooperation between the purchaser and the contractor is formed, the supply of environmental public services is  $S_2$ , and the corresponding benefit marginal utility is  $MU_2'$ , and the benefit actually produces marginal utility waste of  $MU_2' - MU_2$ . At this time, due to the flexibility of the implementation of specific policy parties, the purchaser has "operational space" for specific projects. At the same time, the contractor aims to make profits, and there is a natural rent-seeking motive, thus forming a collusion situation between the purchaser and the contractor, making the purchase activity very easy to form a "grey area". In this state of rent-seeking, the beneficiary is "blindfolded", lacking opportunities and channels for expression, making it difficult to satisfy demands, resulting in loss of utility, and it is difficult to effectively realize supervision, evaluation, and information disclosure. Even in some regions, there is a phenomenon that the supervision and evaluation mechanism is closed to hide the loopholes in the process and system, and some illegal rent-seeking behaviors are turned into legal behaviors.

Situation 5. When the contractor only cooperates with the beneficial, the marginal utility of the beneficial is equal to the marginal revenue of the contractor:

$$MR_c = MU_b \neq MU_p$$

At that time, the cooperation between the beneficial and the contractor was formed at point  $A_3$ , the supply of environmental public services was  $S_3$ , and the corresponding purchaser marginal utility was  $MU_3'$ , and the purchaser actually incurred a marginal utility loss of  $MU_3 - MU_3'$ . At this time, the entire purchase activity is more focused on maximizing short-term benefits at the economic and social levels, ignoring the long-term effect of environmental governance, thus forming a government procurement of environmental public services with a strong profit-seeking attribute, which empties the purchaser. This phenomenon is common in early Western societies. Affected by the privatization of environmental public services, enterprises and social organizations undertake the work of providing environmental public services and communicate directly with

community committees. The government not only has a limited role but also gradually loses its status as a purchaser, making overall planning and long-term planning difficult. This situation was later proved by many scholars to be inefficient.

## 4 Conclusion

As a typical policy practice of multiple collaborative governance, the government's purchase of environmental public services still faces the problem of coordination of interests among multiple subjects. Therefore, this paper discusses the interest relationship among multiple subjects in the process of government procurement of environmental public services, and draws the following conclusions:

In the implementation process of purchasing environmental public services, three core interests are formed due to the separation of the purchaser, contractor and beneficiary. Purchaser, contractor, and beneficiary are independent rational participants. Without external intervention, the state of three-party cooperation is not easy to achieve, but the form of two-two cooperation is easier to achieve, which further forms cooperative advantages and leads to the loss of interests of the third party. In China, this phenomenon is more manifested in the "rent-seeking" state formed by the purchaser and the contractor, which makes the government's procurement of environmental public service policies overflow with unspoken rules under the clear rules. It is necessary to improve the content and platform of information disclosure, establish effective public participation channels, enhance the participation of beneficiary in purchasing activities, and strengthen supervision, so as to improve the effect of policy implementation.

Future research will focus on two aspects: First, around the tripartite interaction model, try to introduce empirical data for empirical testing and simulation analysis to further enhance the realistic explanatory power of the model. Secondly, discuss the buyer's policy tendency by category, expand the coverage of cooperative relations, and improve the theoretical value of the model.

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