Causes analysis on the failure of government environmental responsibility
——Based on the perspective of law and economics

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Abstract. As the important Environmental Interests of Subjects, government behooves to undertake the corresponding responsibility of Pollution Control and Environmental Protection. The current situations in our country, however, appear as government environmental responsibility failure. Based on the analysis of law and economics, this article reaches the conclusion through game analysis, principle-agency relationship and utility theory that the prisoners dilemma of environmental interest game between government and enterprise, and the inherent defect of the principal-agency relationship between central government and local government are the inherent causes of government environmental responsibility failure. Many officials tends to graft and corrupt to maximum their own benefit, thus leading to the government failure among environmental pollution treatment and the environmental responsibility to undertake.

1. Introduction
The development and changes of modern society make the environmental interest subject diversified, and the environmental interest also shows the features of diversity and multi-level nature at the same time. According to the differences between the parties of the right configuration, the environmental interest subject can be divided into government, enterprises and the public. The parties have different demands for environmental interest. The government and enterprises try to obtain more creative environmental interest from natural resources and pay more attention to the economic benefits brought by the environment. However, the public always pursue better natural environment from their own welfare perspective. As the important Environmental Interests of Subjects, government, enterprise and public behoove to undertake the corresponding responsibility of Pollution Control and Environmental Protection. The current situations in our country, however, appear as government environmental responsibility failure, the serious lack of enterprise environmental responsibility and the weak awareness of the public environmental rights. The opening of the 8th part in the 18th CPC National Congress have pointed out the importance of building ecological civilization, that building ecological civilization is a long-term task of vital importance to the people's well-being and China's future. Faced with increasing resource constraints, severe environmental pollution and a deteriorating ecosystem, we must raise our ecological awareness of the need to respect, accommodate to and protect nature. We must give high priority to the ecological civilization. By this token, it is obvious that the achievement of ecological civilization construction is closely related with the environmental responsibility government
to undertake. However, there is serious vacancy of government during the process of ecological civilization construction in our country. Hereby, in this article, we research the inherent causes mainly for the failure of government environmental responsibility based on the legal and economic methods.

2. Environmental benefit game easily falls into prisoners dilemma between government and enterprise

Suppose economic interest subjects of each party involved in the game – both government and enterprise are rational completely and the basis they make decision on is always maximum benefit. Also, there is no imbalanced information between each subject. They know their strategic space and income condition well when they make decision on the affairs related to their environmental interest, but they don’t concern the detail about others’ decisions. Based on the assumption above, we research the inherent causes of the failure of government environmental responsibility at present by the game analysis, starting from the environmental interest game between government and enterprise [1].

As an example concerning the environmental interest game between local government and enterprise, respectively, the decisions they possibly make are issuing a tacit permission of discharging pollution directly to enterprises. In order to pursue the rapid economic development, sometimes it is difficult to take care of environmental protection at the same time, in which case some governments may take the environmental pollution of enterprises as "acquiescence" to a certain extent. The matrix below can reflects their game benefit conditions in more detail:

| Local government | Enterprise          |
|------------------|---------------------|
| Tacit permission | Direct discharge    |
|                  | Processed emission  |

As shown in the table above, imagine local officials performance assessment is directly related to regional economic index. In table 1, productive profit is $I$ without waste treatment, the cost of waste treatment is $C$, the benefits are always $t$ times higher than profits of enterprises whether government issues tacit permission to enterprises’ behavior or not. In this condition, when enterprises choose to discharge pollution directly and governments choose tacit permission, both of them get benefits as $tI$ and $I$; but if governments oppose discharging pollution directly and enterprises conduct waste treatment, then both local governments and enterprises will lose a combination benefits, and that is $(t \times (I - C), I - C)$.

Hereby, just refer to the matrix shown in table 1, when enterprises choose direct emission and governments choose tacit permission, both of them get maximum benefits, and they achieve Nash Equilibrium under this combination strategy. The officers focus more on personal interests when they make decision as the representative of local governments, and possibly, they don’t perform governmental responsibilities in order to achieve personal achievements and promotion. In the process of environmental pollution treatment, if government was treated as a similar organization like enterprise, for members of organization – officers, especially local officers, in a large extent, the goal they pursue is conflicted with the goal set by government – provide excellent public service and push the construction of ecological civilization by policy making and legal methods, this results in the act that officers tend to short-term for their own goals, and this behavior substantively become a big barrier to achieve government macroscopic target.
3. The inherent defect for the principal-agency relationship of environmental responsibility among governments

Social products can be divided into private, public and quasi-public products in accordance with the difference of various products, service exclusiveness and competitiveness provided in market. In theory, as stronger public character and bigger external effect, environmental benefit is more similar with public and quasi-public products in nature. For the affairs related supply of environmental benefit, governmental supply or increasing governmental funding input are imperative. But in current governmental structure of country, the below follow the behavior of the above on environmental protection and management policies are very general, which is quite weak for local government to take environmental responsibilities. In the principal-agency theory, for the affairs related environmental benefit, just refer to figure 1, the principal-agency relationship exists between the public and government at all levels [2,4].

![Figure 1](image.png)

**Figure 1.** The principal-agent relationship of environmental responsibility between central government and local government.

As shown above, the principal-agency relationship of environmental responsibility exists essentially among citizen, government and officers. Public authorize the government and supervise its work, thus to benefit from it. The central government entrusts local governments at all levels to assist its work. With the division of labor above, can a complete principal-agent relationship of environmental responsibility between central and local government exists. Government is authorized by citizen to manage environmental pollution and protect natural environment instead of the public, and award the capital to government in tax. Meanwhile, government will have the rights to use the capital. In principle, the
public should enjoy the environmental protection service provided by government as the beneficial owners.

In the meantime, government is a set of multiple identities containing many individuals, it forms a dual principal-agency relationship, that is the central government entrusts the local government and the local government entrust their representative - local officers. There is a complex principal-agency relationship between the central and local government, each interest subject in the chain has double identity. Theoretically, the central government plays the roles of agency and principal at the same time, on the one hand, according to the authorization of managing the public property, it should take the environmental responsibility in the process of building ecological civilization on behalf of people, and push the construction of ecological civilization from the perspective of policy and legal construction; on the other hand, as the principal, central government entrusts its subordinate body to perform its environmental responsibilities, transfer its environmental responsibilities to local governments at all levels. Therefore, local government should take relevant responsibility as an agent in the process of environmental protection, pollution control and building ecological civilization because they accept the environmental responsibility awarded by the central government. But at the same time, it is a same conception with government that local government is also a theoretic entity which consists of many individuals [3].

Because of the different status the principal and agent have, central government, local government and every government officers separately pursue different political goals, thus, facing different utility function. If regarding environmental interests and economic benefits as commodities, central government will undertake the responsibility of ecology civilization construction, and pursue the improvement of environmental interests in total, thus, preferring more to environmental interests. The improvement of environmental interests makes the better satisfaction, that is to say, as far as central government is concerned, the substitution effect of environmental interest utility is stronger than the economic one. For central government, concretely, the marginal substitution rate environmental interests to economic benefits are:

\[ MRS_{en} = \frac{\Delta en}{\Delta ec} \]  

(1)

At the same time, as its superior government agent of environmental responsibility and rights, local government officers are the final assignee for all people and behave to perform its own environmental responsibility. But in consideration of the officials’ performance assessment mechanism with the main economic index our country currently in effect, enterprises will be limited as soon as the local government enhance the management of environment. Spontaneously, local government get fewer income, the development of Gross Domestic Product (GDP) and employment increase slowly, the improvement of environmental interests are obvious smaller than the central government. In other words, local government takes more utilities subjectively when consuming less. Thus, local government prefers more to economic benefits. As for local government, accordingly, the marginal substitution rate environmental interest to economic benefits is:

\[ MRS_{en} = \frac{\Delta en'}{\Delta ec'} \]  

(2)

According to the analysis above, as for the preference of environmental interests, the central government is higher than the local government, that is to say, the relationship of marginal substitution rate between the two is:

\[ MRS_{ec, en} (C) > MRS_{ec, en} (G) \]  

(3)

Reflecting in the figure, the difference curve of central government utility is gentler than the local government one, as shown in figure 2.
Local officers often combined with enterprises to become an interest group, conniving or even supporting the emissions of enterprises without limitation because their performance appraisal is associated with local economic index, local GDP gets increasing and employment is promoted while government obtains revenue. This result in serious atmospheric pollution and haze, and citizen become the uppermost victims caused by this interest group, they suffer from the diseases without any economic benefits. Officers will try every means to do the rent-seeking activity, which means government intervenes and controls the economic activities by their administration power, hindering the role of competition in the market, and thus, creating an opportunity for few privileges to get excess income by their privilege in order to earn personal benefits, finally resulting in the government failure among environmental pollution treatment and the environmental responsibility to undertake due to corruption [5].

As mentioned above, because of the inherent defect of the principal-agency relationship, in the principal-agency chain of the public and government, the central government and local government, local government and various officers, there is efficiency loss of information delivery and policy implementation. If the central and local government pursue the maximum utility respectively then the agent will pursue his maximum utility function in order to his own interests inevitably, the agent doesn’t insure the interests of the principal, and sometimes will injure the interests of the principal possibly, it results in the failure of governmental environment responsibility in the end.

Therefore, in order to compensate for this shortcoming, we should improve the efficiency of information transmission and governance in the main chain of public and government, central and local governments, local governments and officials at all levels, which can be improved by the development of strict laws and regulations. Define the level of information delivery. At the same time, do reward and punishment. The appropriate reward for officials can improve the efficiency of the ruling; corresponding, combat the wrong ruling vigorously can also play a warning role.

4. Conclusion
As the important Environmental Interests of Subjects, government behooves to undertake the corresponding responsibility of Pollution Control and Environmental Protection. The current situations in our country, however, appear as government environmental responsibility failure. The issues of ecological damage and environmental pollution get worse and worse and the total environmental
interests get injured seriously because of the government environmental responsibility failure. According to this, this article make the conclusions based on the perspective of law and economy that, as for government, because the information is incomplete and asymmetry, central government, as a principal, would never know what action its agent – the final agent of local governments and its environmental responsibility – would take, or even if the central government knows how its agent will assume his awarded environmental responsibility, there will also be abuses in supervising its agent’s effort. Meanwhile, there are interest connections between central government and local governments as well as local governments and government officers, they share the environment corresponding interests and economic benefits, which will make the agent deviate from the principal’s will with impulse, and finally lead to the issue of principal-agency. But the prisoner dilemma of environmental interests game between government and enterprises has further aggravate the failure of government’s environmental responsibility, it is the internal cause for government not performing environmental responsibility well. And concluded a solution according to the analysis above, that is to develop strict laws and regulations, define the level of information delivery and do reward and punishment.

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