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An Application of Ecological Compensation Mechanism Framework: A Case for Yulin County

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Key Words: Ecological compensation; System; Mechanism

Abstract. In this paper, framework of eco-compensation mechanism has been mapped by using principle of system engineering and "layer-by-layer decomposition", combining with the resource of documents and data. Combining with eco-environmental compensation of Yulin coal mining exploration areas, this system framework can be decomposed and its process and mechanism of action can be imitated. Then a general conclusion will be drawn. All that will provide a theoretical basis for our government departments to develop policies of ecological compensation for coal resource exploration areas.

Introduction

At present, coal-mining is still using the traditional modes of production in our country. Most of the coal resource exploration areas always began their environmental governance and restoration after the coal mines were abandoned, whose consequence had huge impact on the environment with increasing cumulative negative effect. Which caused more and more sharp conflicts in economic, environmental and social field? Our government had directly or indirectly participated in environmental governance of mining areas through establishment of guiding principles, promulgation of relevant policies and financing, but the actual results are unsatisfactory.

Both the documentary analysis and structured system analysis methods have been used in this paper. Firstly, eco-environmental compensation of Yulin coal mining exploration areas is deeply analyzed. On the basis of which, framework of eco-compensation mechanism has been mapped by using principle of system engineering and "layer-by-layer decomposition", combining with the resource of documents and data. Also this complex system can be decomposed and its process and mechanism of action can be imitated. Then a general conclusion will be drawn. All that will provide a theoretical basis for our government departments to develop policies of ecological compensation for coal resource exploration areas.

Theoretical Model:"System" and "Mechanism" of Ecological Compensation

Ecosystem is a whole with self-regulatory function and organized as nature or the biosphere[1].Ecosystem Services is regarded that ecosystem puts useful matter and energy to social systems, provides air, water, food and other services for human beings directly or indirectly and accepts or transforms the waste from social systems[2] [3] Function of ecosystem services can be divided into 17 types by Costanza R in 1995[4].We give the definition of "ecological compensation" as follows: it is a kind of means that is used to restore and recover the damaged ecosystem and its services or establish new habitats, which have quite original functions of ecosystem service[5], in order to maintain the overall balance and stability to ecosystem, through administrative imposition on those who are main responsible parties for damaged ecosystem and its services and stakeholders with legal, executive and economic methods.

In accordance with the principle "polluter pays, destroyer controls, beneficiary compensates", suppliers, there are the relatively stable contact ways, order and controlling relationship between users of compensating resource and regulators of compensation process. Suppliers of compensating resource pay tax in accordance with the law; users of compensating resource are in accordance with the law, regulators of compensation process are responsible for the organization, management, supervision of the entire process of ecological compensation. (see Figure 1). Conventional and unconventional work, such as stopping vandalism of the environment, restoring and recovering the damaged ecosystem and its services or establishing new habitats, will be in the charge of agencies.

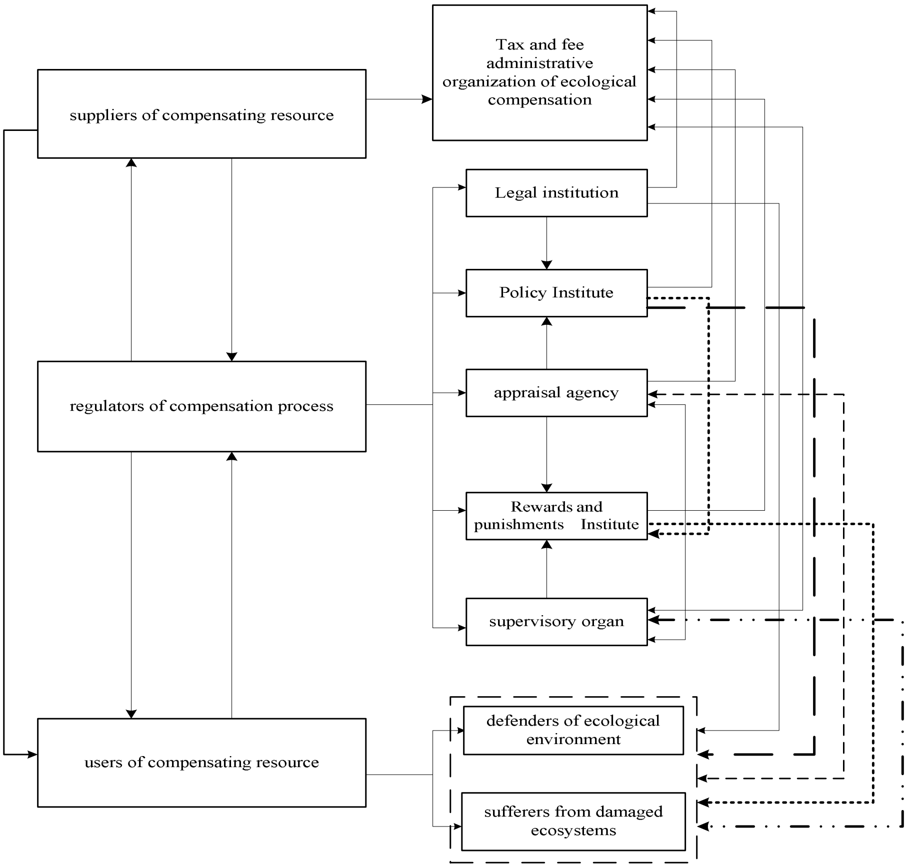

Figure 1 Relative position and correlation for elements of ecological compensation systems

"Mechanism" of ecological compensation is the function or "doing wok" of "system" for ecological compensation. Specifically, "mechanism" of ecological compensation is the result of interaction, feedback and linkage between "suppliers of compensating resource ", "users of compensating resource " and "regulators of compensation process ".

Suppliers of compensating resource pay tax in accordance with establishment of institution and functional division of labor defined by "system" of ecological compensation, according to instructions from regulators of compensation process, following by operating rules for ecological compensation. Users of compensating resource use compensating resource in accordance with the law and policy. "Regulators of compensation process" are responsible for the organization, management, supervision of the entire process of ecological compensation through process monitoring, impact assessment, law, policy incentives and other means. Successful stopping vandalism of the environment, restoring and recovering the damaged ecosystem and its services or establishing new habitats will make smooth "system" and "mechanism" of ecological compensation. (see Figure 2)

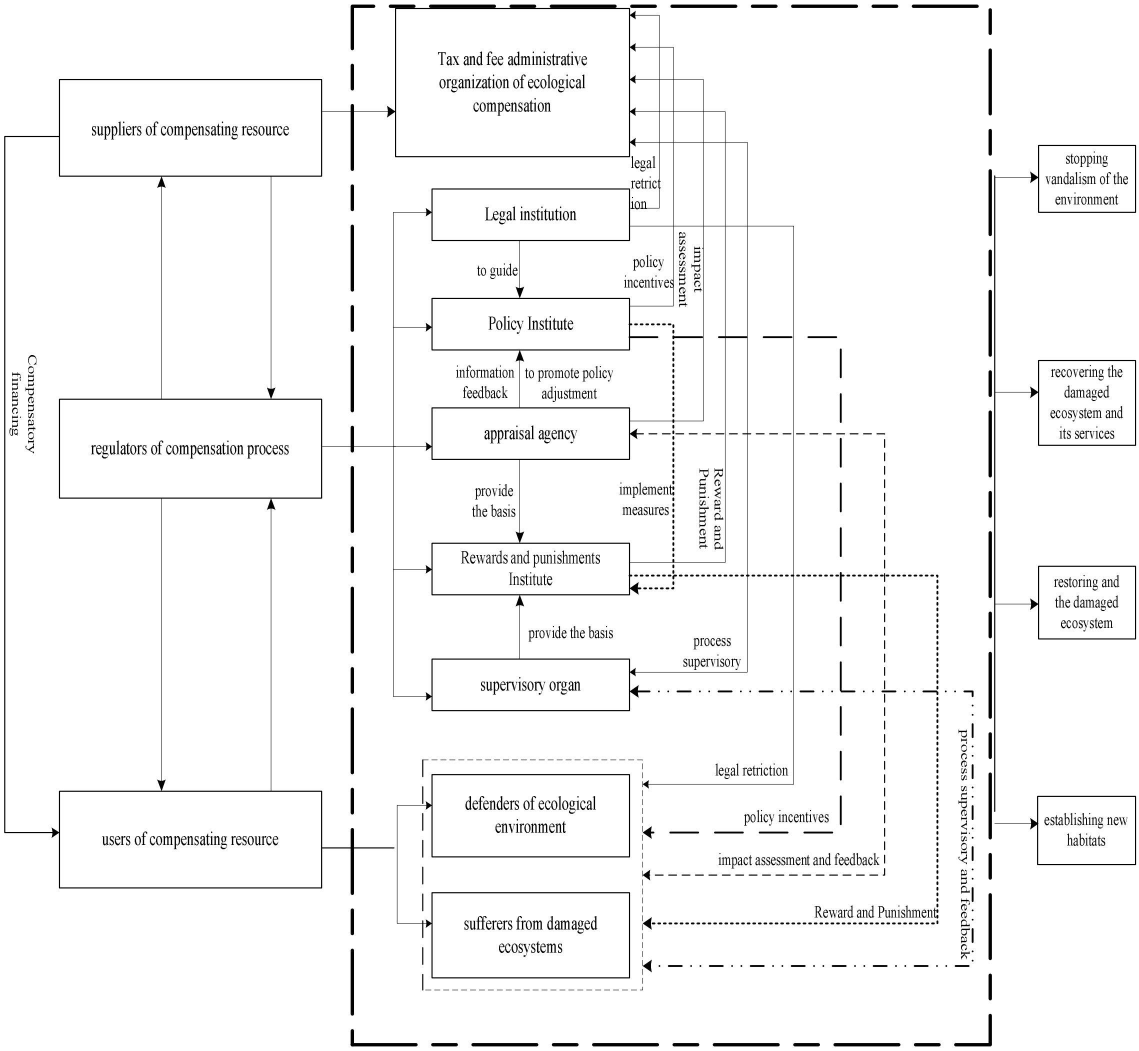

Figure 2 The result of interaction, feedback and linkage for elements of ecological compensation systems

Current Situation and Problems:Ecological Compensation for Yulin County

The area of Yulin City in Shaanxi Province is 43,578 square kilometers, 56% of the entire area is coal mining area. The prognostic reserves of coal is 271.4 billion tons and accounts for 20% in country's total prognostic reserves.[6] It is a n energy chemical industry base in our country. From 1985 to 2008, Yulin coal mining areas had its huge output with 960 million tons[7], in which the output reached 355 million tons in 2012[8].

(A) Present Features to "Mechanism" and "System" of Ecological Compensation for Coal Mining Areas

(1) Three-Level Sub-ordinations of Coal Mining Enterprises

Coal Mining Enterprises in Yulin can be divided into three types: state-owned enterprises, provincial enterprises and municipal enterprises. Among which, the biggest one is Mine of ShenHua Coal Group Limited Liability Company, a part of State-owned Assets Supervision and Administration Commission; Mine of Zhong Neng Coal Group Limited Liability Company is a part of Shaanxi Assets Supervision and Administration Commission; other municipal enterprises are under the jurisdiction of local mining companies. Yulin government has no supervision on state-owned enterprises and provincial enterprises.

(2) Multi-sectoral Participation in the Supervision of the Local Coal Mining Enterprises

Although each section separately has its custodial right, there is no strict division of responsibility, power and interests, which made supervision on eco-compensation in Yulin coal mining areas "offside" and "omission". If there are some profitable things, multi-sectoral supervision is very obvious; on the other hand, supervision is "omission".

(3) Shortage of Laws, Regulations and Policies of Ecological Compensation

China hasn't a unified eco-compensation standard including charging items, volume and way for coal mining areas. It is different in measurement basis, standard, use of funds and charging items to tax and fee for mineral resources in different areas. If there are not laws, regulations and policies for the collection and use of tax and fee, those who refused and prevaricated to pay the fees of ecological compensation and who abused and embezzled resources can't get punishment. Those who have contributed to ecological compensation obligations and responsibilities can't get an effective institutions and individual incentives.

(B) Design of System of Ecological Compensation for Yulin Coal Mining Areas

Setting up eco-environmental governance committee of Yulin coal mining areas, begin to carry out unified supervision to ecological compensation of state-owned enterprises, provincial enterprises and municipal enterprises, deign strategic objectives, strategic mission, strategic stage and strategic measures and give the decomposition and implement of goals and tasks at all levels of government departments, enterprises, social organizations and other related persons. Eco-environmental governance committee of Yulin coal mining areas set up three permanent bodies: appraisal office, monitoring office and the compensation fund administrative center. Appraisal office is responsible for designing ecological compensation standard system for Yulin coal mining area including index system, weight indicators, measurement methods and measurement procedures. Based on ecological compensation criteria, the number of eco-compensation costs the coal mining enterprises and their stakeholders should be paid will be proposed; doing comprehensive evaluation to collection of fees and taxes and use of the effect. Monitoring office is responsible for setting up restraint systems and incentive policies to providers and users of ecological compensation resources; doing supervision on the implementation of ecological compensation process; giving out order of reward or punishment according to supervision records and appraisal results. Compensation fund administrative center is in charge of the collection, management and use of eco-compensation funds. National, provincial and municipal people's congresses and governments give the authority to systems and a system of incentives and disincentives of ecological compensation for coal mining areas through legislation, administrative regulations and other legal forms. Local departments such as Local Tax Bureaus, Environmental Protection Agency, Forestry Bureau, Bureau of agriculture, Bureau of Water Resources, Land and Resources Bureau, Finance Bureau, should impose and use fees and taxes of ecological compensation; giving reward or punishment according to order from monitoring office.

(C) Design of Mechanism of Ecological Compensation for Yulin Coal Mining Areas

Smooth workflow of ecological compensation for Yulin coal mining areas should be constructed. Eco-environmental governance committee of Yulin coal mining areas, begin to carry out unified supervision to ecological compensation of state-owned enterprises, provincial enterprises and municipal enterprises, deign strategic objectives, strategic mission, strategic stage and strategic measures and give the decomposition and implement of goals and tasks at all levels of government departments, enterprises, social organizations and other related persons. Appraisal office is responsible for designing ecological compensation standard system for Yulin coal mining area including index system, weight indicators, measurement methods and measurement procedures. Based on ecological compensation criteria, the number of eco-compensation costs the coal mining enterprises and their stakeholders should be paid will be proposed; doing comprehensive evaluation to collection of fees and taxes and use of the effect. Monitoring office is responsible for setting up restraint systems and incentive policies to providers and users of ecological compensation resources; doing supervision on the implementation of ecological compensation process; giving out order of reward or punishment according to supervision records and appraisal results. Compensation fund administrative center is in charge of the collection, management and use of eco-compensation funds. National, provincial and municipal people's congresses and governments give the authority to systems and a system of incentives and disincentives of ecological compensation for coal mining areas through legislation, administrative regulations and other legal forms. Local departments such as Local Tax Bureau, Environmental Protection Agency, Forestry Bureau, Bureau of agriculture, Bureau of Water Resources, Land and Resources Bureau, Finance Bureau, should impose and use fees and taxes of ecological compensation; giving reward or punishment according to order from monitoring office. (see Figure 3)

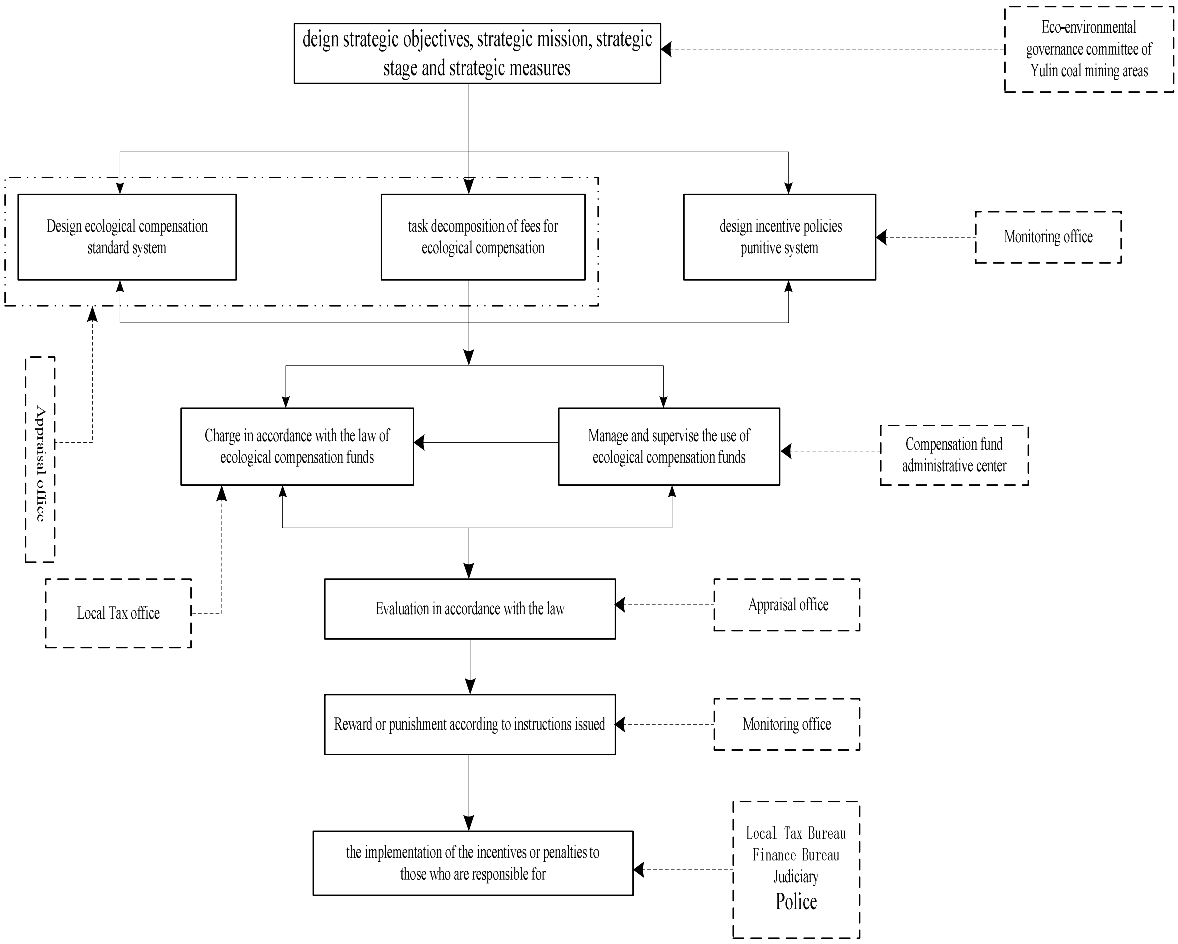

Figure 3 Workflow of Ecological Compensation for Yulin Coal Mining Areas

Summary

If there is a smooth mechanism of ecological compensation for Yulin coal mining formed by system of ecological compensation, we regard it as a good system of ecological compensation. A smooth mechanism of ecological compensation for Yulin coal mining should be able to stimulate enthusiasm of suppliers, users of compensating resource and regulators of compensation process to achieve goals of ecological compensation for coal mining areas, increase automaticity, consciousness, initiative and consistency in behavior of different social groups to environmental protection and the implementation of ecological compensation. A few years later, Yulin will achieve the object of win-win with environmental protection and coal mining and it has become a "Frontier Oasis" with ever trickling mountains, rivers, crystal clear; desert wasteland stretches of vegetation, green and luxuriant; urban villages nestled trees, fresh air; people can live and work in peace and contentment.

Acknowledgements

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