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A Strategy Study on the Environmental Protection of the Energy and Chemical Industry Base in Northern Shaanxi

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Abstract

In recent years, with the implementation of national development of the West Regions, the energy and chemical industry base in Northern Shaanxi had significant progress. Meanwhile, environmental problems triggered by the excessive usage of resources, including the groundwater level descending, ground sinking, river drying up, severe pollution of waste residue, water and gas, have brought serious potential danger to the development of the base. This paper, based on thorough analysis to the investigation data about the environmental status and the existing problems of the base, elaborates on the root cause of the environmental issues in terms of policy, capital and society etc., and proposes strategies for environmental protection in Northern Shaanxi.

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1. Introduction

Since established by the national government, the base of energy and chemical industry in Northern Shaanxi has formed a industrial system with coal, oil, natural gas and rock salt mining as foundation, electrical power, chemical and building material industry as leading industry, became the major engine to the economy and development of society. However, due to the geographical condition, the base has been suffering from drought, sand storm, desertification, and soil erosion, leading an extremely fragile environment. Despite a series of ecological construction by government which achieved a certain success, the deteriorating situation overall fails to be effectively handled due to the long term negative impacts from human and nature factors, inadequate funding, as well as the speed of treatment outweighed by that

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of destroy. Therefore, it is a scientific topic with crucially realistic significance to exert the resource advantage, protect the environment, and achieve the harmonic developments between the construction of the energy and chemical industry base and the environment protection.

2. The Status of the Environmental Problems of the Energy and Chemical Industry Base in Northern Shaanxi

The environmental status of the energy and chemical industry base in Northern Shaanxi can be represented by the following aspects:

2.1. Water resource deterioration

Located in the arid region of China, the problems of regional and seasonal water-deficiency commonly exists in Northern Shaanxi. Along with the progress of the resource exploitation and base construction, water shortage has become the bottleneck confining the development of the base. According to measurement, the water shortage amount in Yulin area is 800 million m³ in 2010, and further more, in 2020 the water demand amount will reach 2,600 million m³, when 1,800 million m³ water may be lacked. Meanwhile, resource exploitation has brought a set of problems, including the groundwater level descending, ground sinking, river drying up and the like. For instance, in the water rich area where Shenfu and Yushen mining zones locate, the groundwater level dropped by 10 to 12 meters resulting from the resource exploitation; affected by various coal mines along Yaoye River, the drying out period lasts two thirds of one year's time, which makes the river seasonal; in the two major coal producing counties, Shenmu and Fugu, the polluted farmland suffering from severe crop yield reduction or even cultivation incapability reaches 2,800 hectares in a 32 km² tract, more than ten rivers dry up ever, and the water crisis emerges in many villages in the mining zones.

2.2. The vegetation destruction and severe ground sinking

Along with the development of the base, the situation of the soil desertification becomes more and more serious. According to statistics, the desertificated area is enlarging at a rate of 200 km² per year, resulting in great loam area loss, wetland area withering, and severe damage to the vegetation. In the region of Yulin, 16,000 hectares of vegetation have been destroyed, and 18,000 hectares of soil desertificated due to the development of coal mining ; in the whole region, the hollow zone caused by the coal mining reaches 499.41 km², and increasing by 70 to 80 km² yearly; the sunk part of 118.14 km², and increasing by 30 to 40 km² every year.

2.3. Serious "Three Wastes" Pollution

The discharge of "Three Wastes" increases largely and the pollution becomes more and more serious with the fast development of the base. In the recent years, the discharge amount of the industrial waste gas, waste dust and fog are obviously increasing. It is measured that regarding the coking plant industry alone, the yearly discharge amount of waste gas reaches to 0.6 billion m³, which heavily polluted the air. For example, in Shenfu mining zone, the total discharged amount of waste water each year reaches to 40 million tons; the oil pollution rate in Yan River exceeds the standard by 7 times; the water qualities of Wuding River and Yuxi River have been evaluated as type IV. Moreover, the water for living and agricultural use has been affected directly by the untreated discharge of industrial waste water and leakage of the waste residue.

3. Analysis to the causes of the environmental problems of the base

Concluding from above, the environment of the base has reached an extreme level. Thus, to effectively protect its environment and achieve harmonic development, the causes of environmental issues should be deeply identified. Based on considerable amount of investigations and studies, the reasons can be summarized as the following:

3.1. The low threshold for resource exploitation, and great difficulty to treat

Most of the industrial development in the base is established by the countryside firms where the situations of low threshold, low technological content, low resource use efficiency, and high discharge of wastes commonly exists. Particularly, it once emerged the case that homemade alkali and coking appeared in every village and home, causing firing and smog every where, which polluted heavily, wasted the resources, and threatened the civilians' living conditions. So, in such a heavy polluted zone, the difficulty of cure is great.

3.2. The low resource-processing ability level, and high pressure to treat

In the base, most of the firms possess low scientific and technical content in the local resource processing. Although the processing upgrades the additional value, that greatly contributes to the economic increment, those industries basically are highly water and energy consuming, largely lands wasting, and highly waste discharging. All of that bring about that the environmental treatment goes far beyond the environmental content and the heavily environmental burden to the base.

3.3. The imperfect mechanism of the environment compensating, and inadequate funding for the environmental treatment

In terms of environmental treatment, a number of the central and provincial enterprises fail to contribute the environmental compensation fees, which partially lead the environmental compensation to capital shortage. At the same time, the government's investment is only sufficient for maintaining the daily operation for the energy-saving, reducing discharge, and pollution treatment and so on. The imperfect mechanism of compensation and the shortage of environmental treatment capital, cause the energy advantage of the base fails to transform into the economic and finance advantage for Northern Shaanxi region, which goes against the further development of energy and the construction of the base.

4. The environmental protection measurements of the base

Aims at the above environmental issue and the causes, the following measurements should be carried out:

4.1. Strengthening the mechanism construction and consummate the management policy

In the aspect of resource development management, further mechanism construction should be strengthened. Under the government's unitive management, the threshold to the energy market should be enhanced, and a strict policy for entering the market should be established. The environmental protection concept should be built up. What should be actively pushed and rigorously executed includes that environmental influence evaluation, total amount control to the waste discharge, the auditing policy on

the environmental target and responsibilities. Meanwhile, active measurements should be adopted to cure the environment, the guideline of “combination of exploitation and protection” must be persisted in, the policy of treatment to the environment damage in limited period needed to be established, and the verification or inspection to the environmental refurbishment and treatment should be set up.

4.2. Utilizing the technology improvement, and generalizing the clean production

Relying on the advanced environmental protection technology, the firms should be guided to start clean production. Sized corporations to implement the audit of clean production, large and key ones to strengthen environmental management. The energy developing firms should transform from treating afterwards to protecting in advance. In the process of synthesis development, the firms should be facilitated to inspect and manage every single detail, in order to achieve the minimum discharge amount of the waste. And, the waste must be detoxified consciously to alleviate the damage to the environment.

4.3. Establish the mechanism of scientific environment compensation

To consummate the mechanism of scientific environment compensation, and strengthen the compensating force for firms supporting environmental protection. which ensures sufficient funding for environmental protection of local government to resolve the geological disasters, environment destruction and the life issues of local civilians solicited by the energy exploitation. Resource using and compensating fee should be relatively raised, in order to increase the procuring cost of the resource exploitation and upgrade the recycling rate of resource and energy. On the other hand, a nationwide mechanism of “the compensation from the resource input regions to the output regions” built by the national government may be pushed by the cooperation among the resource-rich cities.

4.4. The implementation of tax deduction, and strengthen the force to the environmental protection investment

A variety of policies of tax deduction and allowance may be adopted to encourage the firms on resources saving, pollution treatment technology development and utilization. And, the policy of discharge approval, waste treatment fee and total amount control of waste should be established; the discharge fee and waste treatment fee charged according to the appraised amount of discharged waste, and the funding collected must be used for environment treatment, development and innovation of the environmental technology; audit the discharging firms’ waste amount, and implement the mechanism of trading discharging index; establish the environment protection fund. The money raised should be used for the environment protection and treatment of the base, invest in the firms using clean energy, launch the treating pollution activities, disseminate the idea of saving, reward the significant contributor of saving projects etc..

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Reference

- [1] HOU Duzhou, WANG Jianse, LI Huimin. The cyclic economy system analysis Of the Energy and Chemical Industry Base in Northern Shaanxi. *Journal of Xi'an University of Architecture & Technology(Social science edition)*;2005
- [2] YAN Wenzhou, HOU Duzhou. The information networking technology study of Yu Sheng Coal Liquefaction Project. *Journal of Xi'an University of Architecture & Technology(Social science edition)*;2003
- [3] ZHU Binmei, HOU Duzhou, Ideas about operating and decision-making mechanism of Yu Shen Coal liquefaction Base. *Journal of Xi'an University of Architecture & Technology(Social science edition)*;2003
- [4] FAN Limin. The Water resources issue in Construction of the Energy and Heavy Chemical Industry Base in Northern Shaanxi. Resources Investigation and Evaluation. *Resource survey and evaluation*; 2005, p.17-21
- [5] HOU Duzhou, WANG Jianshe, LI Huimin, ZHANG Bo. The analysis of essential cyclic economy factors of the Energy and Chemical Industry Base in Northern Shaanxi. *Journal of Xi'an University of Architecture & Technology(Social science edition)*;2005
- [6] PAN Xinhua, The sustainable development methods of the Energy and Chemical Industry Base Construction in Northern Shaanxi. Innovation and Strategy. *Reform and strategic*;2007, p.122-124
- [7] ZHAO Jing, ZHANG Jinsuo, The Discussion about Environmental sustainable development issues of the Energy and Chemical Industry Base Construction in Northern Shaanxi. *Energy technology and management*;2007, p.80-85