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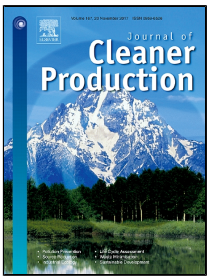

The Relationship Between Regional, Industrial Organizing Levels and Ecological Economic Efficiency

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The Relationship Between Regional Industrial Organizing Levels and Ecological Economic Efficiency

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Abstract: This paper investigated the roles of industrial organizing levels, economic resource endowments, and natural resource endowments in the development of ecological economic efficiency using data from China during the past decade. Besides an original assessing method for industrial organizing levels was developed, this paper investigated resource usage efficiency and pollution emission efficiency to determine the ecological economic efficiency. And this relationship was defined by the artificial neural network based regression method. In general, China's industrial organizational levels and ecological economic efficiency increased in the past decade, and had a positive relationship between them. However, resource endowments had a negative correlation with the ecological economic efficiency. Moreover, no obvious quantitative relationship was found between the organizational levels and the efficiency of water usage. After a deep discussion, policy suggestions were offered such as enhancing the marketization of waste dealing businesses, more publicity regarding preserving resource-rich regions, and increasing industrial organizing levels.

Keywords: Industrial organizing; ecological economic efficiency; ANN-R; industrial diversity; industrial advance

1. Introduction

Clean production is achieved not only by a single factory and an efficient production line, but also by establishing an organized relationship among similar factories. (Spekkink 2015, Cao and Wang 2017). For a single factory, it has the advantage on a specific environmental problem solution, such as decreasing pollution by technology upgrade. However, for a well-organized industrial factory system, it can bring a much larger scale advantage on pollution control and resource utilization(Liu, Adams et al. 2016). Take the thermal power generation factory- cement factory system as an example, when the power factory sells slags to cement factory, the waste changes to a by-product. In this view, a progress on regional industrial organizating would reach a more profound influence on regional ecological environment.

Researchers in the fields of economics, geography, and industrial science found that economic and productive efficiency, along with innovation in industrial cluster zones, improves with the exchange of knowledge, especially when communicated in person. (Ben Letaifa and Rabeau 2013, Steinmo and Rasmussen 2016). According to these studies, the number of patents had a positive correlation with innovation, but less researcher digged on how much these patents contribute to a better environment. (Broekel, Fornahl et al. 2015, Yıldız and Aykanat 2015, Lazzeretti and Capone 2016). As such, the degree to which an industrial cluster, as an advanced organizational form, contributes to more efficient natural resource usage and decreases pollution is unknown. A better understanding of the impact of industrial clusters would benefit the government's environmental protection policy for regional industrial development, and may lead to policies that benefit both the industries and the environment.

In the past decade, industrial ecology and circular economy studies focused on industrial parks