



## Commentary

## Environmental externality and inequality in China: Current Status and future choices

Xiaoli Zhao <sup>a,b,\*</sup>, Sufang Zhang <sup>a,b</sup>, Chunyang Fan <sup>a,b</sup><sup>a</sup> School of Economics and Management, North China Electric Power University, Beijing, China<sup>b</sup> Institute for Low Carbon Economy and Trade, North China Electric Power University, Beijing, China

## ARTICLE INFO

## Article history:

Received 22 February 2014

Accepted 25 February 2014

Available online 18 April 2014

## Keywords:

Environmental externality

Environmental inequality

Health loss

Cancer villages

China

## ABSTRACT

Along with China's rapid economic growth, the environmental externality in the country is getting more and more serious. China's environmental externality is accompanied by environmental inequality, which presents two characteristics: First, the health loss caused by environmental externality is concentrated in the elderly and children. We take Beijing as an empirical analysis to conclude that children (0–4 years old) are the largest group suffered from respiratory disease; while the seniors are the largest group suffered from cardiovascular disease. Second, China's environmental inequality is mainly caused by the transfer of industries from urban to rural areas/suburbs. The villagers in poor rural areas are the biggest victims. China's environmental inequality is reflected particularly by the phenomenon of "cancer villages" which has existed ever since the end of 1970s. Finally, policy recommendations are provided for reducing China's environmental externality and inequality.

© 2014 Published by Elsevier Ltd.

## 1. Introduction

In early 2013, heavy smog blanketed most east and central regions of China, with PM<sub>2.5</sub> readings far in excess of levels considered safe. The smog affected 600 million people and an area of 2.7 million square kilometers across 17 provinces and cities.<sup>1</sup> That is to say, smog heavily affected more than one fourth of the country's land and nearly half the population, placing China's environmental woes at the center of the global attention again. The serious environmental pollution is a byproduct of China's rapid economic development. Over the last three decades China's economy has developed at a marvelous speed with an average annual GDP growth of about 9%. At the same time, China's rural population living in poverty fell from 250 million in 1978 to 26.88 million in 2010 (BBC, 2011). However, on the other hand, China's growth has been uneven—rural-urban inequality and coastal-inland gap are increasing (Goh et al., 2009). With such a growth inequality, China's environmental inequality has been widened. As compared with income inequality and regional development inequality, environmental inequality has more direct impact on people's health. In

addition, it would weaken a country's capacity to reduce poverty. The World Health Organization estimated that, globally, at least a quarter of the burden of disease could be attributed to environmental factors, and it gave a preliminary estimate of 22% for China in 2009.

During the early years, China had dealt relatively effectively with environment-related problems associated with poverty and under-development but this changed during its transition to a market economy (Fang and Bloom, 2010). In the process of transition, some enterprises and local governments have paid more attention to economic performance while ignoring environmental pollution and its impact on people's health. In poor rural areas, pollution and body injury are severer since Town and Village Enterprises (TVEs) have been found to discharge higher levels of heavy metals and other pollutants (Dong et al., 2011). In addition, as regulations are more strictly enforced in wealthier urban areas, industries are transferring to less affluent cities or rural sites, taking their pollution with them (Jennifer, 2010).

Some studies have explored China's environmental pollution during its rapid economic growth. For example, Managi and Kaneko (2009) analyzed the factors affecting pollution level in China. They found that environmental performance index, abatement effort, and increasing returns to pollution abatement were important factors of controlling environmental pollution. Vennemo et al. (2009) provided a broad overview of China's air and water pollution. They found that there had been uneven progress in solving

\* Corresponding author.

E-mail address: [email99zxl@vip.sina.com](mailto:email99zxl@vip.sina.com) (X. Zhao).<sup>1</sup> Data source: Heavy smog in early 2013 blanketed one fourth of the country's land, and 600 million people were affected. 29 October, 2013. <http://news.gog.com.cn/system/2013/10/29/012819470.shtml>.

China’s environmental issues. Bai et al. (2011) made an assessment of heavy metal pollution in the Pearl River Estuary, South China. It is concluded that almost all metals exceeded their lowest effect levels, and a few of them exceeded the severe effect levels. Wang et al. (2012) investigated the chemical-related environmental issues in China. They argued that the development of China’s chemical regulations has not covered the entire life cycle of chemicals. Hence, it is imperative to improve the current chemical management system.

The studies of environmental inequality combined with environmental externality in China are scarce. A few studies (Schoolman and Ma, 2012; Ma, 2010; Wang and Zhou, 2012) demonstrated that the environmental inequality in China was evidenced by the fact that the rural migrants suffered more than city dwellers. Comparing with the existing literatures, the main contribution of this study is that we investigate China’s environmental externality and inequality from the perspective of health loss. We firstly analyzed the impact of environmental externality on health loss of various ages and found that the seniors and children are the biggest victims of air pollution. Secondly, we illustrated that the transfer of China’s industries from urban to rural areas led to more and more occurrences of “cancer villages”, typically reflecting China’s environmental inequality. Finally, we put forward the future choices for Chinese policy makers to address these issues.

**2. China’s environmental externality led to the serious health loss of the seniors and children: an empirical study of Beijing**

**2.1. Method**

In order to study the health loss caused by China’s environmental externality, we use the corrected human capital method in this study. The calculation steps are as follows: first, set up dose–response model, to identify the impact of pollution density change on the residents’ death rate; second, calculate the number of residents’ premature death; third, study the economic loss caused by the residents’ premature death.

The data of premature death number at age stage level is collected from China’s Health Statistic Summary in 2011; the data of death from respiratory diseases and cardiovascular disease in Beijing in 2012 at regional level, the per capita GDP and its growth rate of Beijing are collected from Beijing’s Statistic Yearbook (2012); the average inflation rate of Beijing is collected from World Economic Outlook Databases [DB], IMF, 2012. The data of death number caused by various diseases is collected from the Health Protection Center, Hongkong Department of Health (2011). The data of air pollution density is collected from the Hongkong Environmental Protection Agency (2011); Humidity data is collected from Weather Library [DB], The Hong Kong Observatory (2011); the prices of meat and eggs are collected from Consumer Price Index Report (2011).

**2.2. Results and analysis**

**2.2.1. The number of premature death caused by pollution**

The number of premature death caused by pollution is shown in Table 1. It indicates that the number of premature death from CVD (cardiovascular disease) caused by pollution in Beijing in 2011 was 577, accounting for 5.46% of the total death from CVD under the age of 80. The number of premature death from RPD caused by pollution in Beijing in 2011 was 260, accounting for 6.28% of the total death from RPD (respiratory diseases) under the age of 80.

**Table 1**  
The number of death caused by CVD and RPD in Beijing in 2011.

|   | CVD    | RPD   |
|---|--------|-------|
| The number of premature death caused by air pollution | 577    | 260   |
| The total number of death                             | 10 567 | 4135  |
| The proportion of death from pollution to the total   | 5.46%  | 6.28% |

**2.2.2. The number of premature death at various age stages and the relative economic loss**

The number of premature death caused by CVD and PRD is shown in Fig. 1. It is indicated that the children of 0–4 years old and seniors over 65 years old were the largest group suffering from RPD with the premature death; and seniors over 50 years old were the largest group suffering from CVD.

Accordingly, the economic loss of premature death in Beijing from RPD over the age of 0–4 years old is largest with the loss of 5 6897.80 thousand Yuan in 2011, amounting to 32.1% of the total economic loss of RPD. While the economic loss caused by premature death from CVD over the age of 50–74 is the largest. The results show that children and seniors are the biggest victims suffered from air pollution.

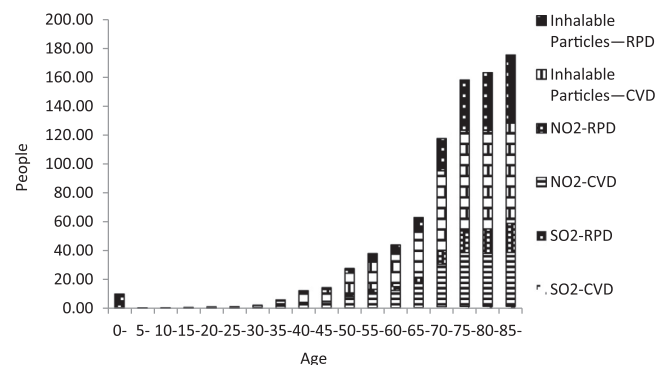
**3. The transfer of industries from urban to rural areas/suburbs led to more and more “cancer villages” in China**

**3.1. The transfer of industries from urban to rural areas/suburbs**

Zhejiang is a province with many severe potential pollution enterprises in China. In 2012, there were 1174 electroplating enterprises, 113 leather tanning enterprises, and 62 lead storage battery enterprises in operation, accounting for 28.42%, 14.14% and 6.11% in the whole nation respectively (Wang and Zhou, 2012). The key pollutant enterprises locate in rural regions in this province outnumbered those in cities. For example, for leather tanning enterprises, there were 109 enterprises in rural regions, 27 times more than those in cities; lectorplating enterprises, and heavy metal mining & processing enterprises located in rural regions were 6 times more than those in cities.

Beijing and Chongqing are two municipalities in China. To ensure the environmental quality in Beijing during the Olympic Games, all pollution enterprises were moved out of the Fifth Ring Road, and located in rural regions prior to the Games. In Chongqing, in order to improve the environment in urban areas, the “Clean Energy Program” and “Sky Cleaning Program” were launched. Over the period from 2006 to 2011, more than 100 pollution enterprises were shut down or moved out of the urban areas (Zeng and Zeng, 2011).

Another example is Hebei province. At the end of 2007, there were 59 876 under-scaled enterprises (non-state-owned enterprises with an annual sales income below 5 million Yuan), most of which were located in rural areas (Li and Wan, 2009). Due to their low economic ability and low technology level, these enterprises were faced with backward production process, lower utilization of energy consumption, as well as inability of dealing with the Three Wastes (Waste gas, water and solid). As a result, they emitted large



**Fig. 1.** The number of premature death caused by air pollution in Beijing in 2011.

Download English Version:

<https://daneshyari.com/en/article/4424327>

Download Persian Version:

<https://daneshyari.com/article/4424327>

[Daneshyari.com](https://daneshyari.com)