Transactions on Environment, Energy and Earth Sciences
ISSN: 2960-1924, eISSN: 2960-2300 | Volume 2
ERET 2024

# Analysis on the Influencing Factors of Environmental Protection Public Report

Yiyun Zhang

Department of Economics & Management, Nanjing University of Science and Technology, Nanjing, China

244849255@qq.com

**Abstract.** Based on the relevant data of the national environmental protection report online unified management platform, the influencing factors of environmental protection public report was explored in this paper through SPSS linear regression analysis. In the paper, it was found that: the level of economic development, population size, investment level and trade opening level were positively related to the number of public environmental protection reports, among which, the level of economic development had the strongest correlation with the number of environmental protection reports. It was revealed that: on the whole, China's current economic growth was still at the expense of the environment the expansion of population size had not yet produced agglomeration effect, the efficiency of environmental protection investment needed to be improved, and the level of introducing foreign advanced technology still had room for progress. Therefore, there is still a contradiction between the public's demand for a good ecological environment and the reality of environmental deterioration. We must further optimize the economic structure and population size, improve the utilization efficiency of governance funds and the level of environmental protection technology, and further encourage public participation in environmental protection.

**Keywords:** Environmental protection report; Influencing factors; Linear regression.

## 1. Introduction

In recent years, the concepts of ecological civilization and green development have been put forward one after another, and in 2020, the Central Economic Work Conference further included "peaking carbon emissions by 2030 and achieving net-zero carbon emissions by 2060" in the list of major tasks for national development, which further demonstrates China's determination to govern the environment. The public, as one of the important subjects of environmental governance, has received more and more attention from the Party and the government, and the Environmental Protection Law, which was revised and passed in 2014, clearly stipulates that citizens, legal persons and other organizations enjoy the right to obtain environmental information, participate in and supervise environmental protection in accordance with the law, and also undertake the obligation to protect and improve the environment. The report of the Nineteenth National Congress also proposes the construction of an environmental governance system led by the Government, with enterprises as the main body and the joint participation of social organizations and the public.

In the context of the era of big data and "Internet +", the former Ministry of Environmental Protection in 2015 built the national environmental protection report online unified management platform. The platform integrates 12369 hotline, microblogging, network and other reporting channels, and establishes a comprehensive database of environmental protection reports at the national, provincial, municipal and county (district) levels. Reporting through the environmental protection report management platform has become one of the important ways for the public to reflect environmental issues to the government.

This paper utilizes the relevant data of the environmental protection reporting management platform to explore the influencing factors of public reporting on environmental protection in China. This paper selected the gross domestic product of each region, the end of the year the number of population, the number of government financial expenditures on energy saving and environmental protection, and

the total import and export of goods accounted for the proportion of the year's gross domestic product to measure the level of economic development of the region, the size of the population, the level of investment in environmental governance and the degree of openness of the trade, the use of linear regression SPSS to analyze the impact of the above factors on the environmental protection of China's citizens to report the behavior of the report. It is hoped that it can provide some useful insights for the improvement of the efficiency of China's environmental governance, thus promoting the optimization of the environmental governance model, so that the public can play a greater role in environmental governance.

## 2. Literature review

In the context of ecological civilization construction, public participation in environmental protection has its own unique theoretical logic and practical needs. Ren Xiang (2020) points out that public participation in environmental protection is based on the theories of citizens' environmental rights and participation in democracy, and is a requirement for realizing environmental justice, enhancing environmental benefits, and manifesting the people's centrality; Chen Huiling (2018) argues that only the public's active participation in environmental protection can optimize the government's environmental decision-making and reduce the cost of environmental governance, so as to make the environment fundamentally improved; and a portion of scholars have confirmed the key role of the public in environmental protection by means of empirical analysis confirmed the key role of the public in environmental protection. For example, Zhang Zhibin (2021) used panel data from 35 key cities in China from 2011 to 2017 to verify that public participation can form a supervision of the government and enterprises, thus reducing the emission intensity of urban pollutants; Yue Qinglei (2020) based on the survey data of CGSS2015, used the method of hierarchical modeling to measure the willingness of the public to participate, the smoothness of the channels, and the effect of the participation showed a positive correlation with environmental governance satisfaction.

And environmental protection reporting as an important way of public participation in environmental protection also plays a key role in the process of environmental governance, but the current academic research on environmental protection reporting is not much. Some scholars have analyzed the status quo and countermeasures of regional environmental protection reporting, for example, Ke Yong et al. (2019) conducted a statistical analysis of environmental pollution letter and petition complaints and pollution types in Weinan City in recent years, and put forward countermeasures to optimize environmental governance. There are also some scholars who have analyzed the influencing factors of environmental reporting, but most of the studies focus on factors such as institutions, culture, government behavior, and personal values, and fewer start from the differences in the degree of public participation in environmental protection between provinces and explore the influence of socio-economic factors on individual environmental reporting. Therefore, quantitative analysis combined with regional GDP, population size and other statistical data will undoubtedly help to enhance the persuasiveness of the conclusions and expand the knowledge of issues related to environmental reporting.

## 3. Research hypothesis

Synthesizing previous studies and based on the research objectives, this paper selects four representative and easily quantifiable socio-economic factors. These factors have an impact on environmental quality, which in turn affects public environmental reporting behavior.

### 3.1. The level of economic development

According to the environmental Kuznets curve, economic growth leads to initial environmental degradation, and when economic development reaches a certain level, or a certain “inflection point”, further economic growth will lead to an improvement in environmental quality. Yu Qiuyue (2020) pointed out through empirical research that the Yangtze River Delta region has shown the trend of

environmental quality improvement with economic growth. However, Ma Jun et al. (2020) showed that the current economic growth in Tianjin still leads to more obvious environmental pollution. Therefore, from a national perspective, there are two possibilities for China as a whole to have crossed or not crossed the "inflection point" of the environmental Kuznets curve, and thus a hypothesis can be formulated:

Hypothesis H1a: The higher the level of economic development, the better the quality of the environment and the less the public reports on environmental protection.

Hypothesis H1b: The higher the level of economic development, the more environmental problems there are, and the more the public reports on environmental protection.

### 3.2. Size of population

Similar to the environmental Kuznets curve, there is an inverted U-shaped relationship between population size and environmental pollution. Before the population size reaches the "inflection point", the larger the population size, the greater the pressure on the ecological environment caused by human activities. Lin Fuxing et al. (2021) pointed out that the expansion of regional population size will bring a series of environmental problems, and the government's environmental governance will be more difficult. Gao Bin (2021), in his study of the impact of socio-economic factors on urban air quality in China, also mentioned that the increase in population will bring about a decline in environmental quality. After the population size reaches the "inflection point", the agglomeration effect will occur, thus reducing the pollution in the production process. Thus, the hypothesis is formulated:

Hypothesis H2a: The larger the population size, the worse the environmental quality and the more public environmental reporting.

Hypothesis H2b: The larger the population size, the better the environmental quality and the less the public environmental reporting.

### 3.3. Level of investment in environmental governance

The more money invested by the government or enterprises in the field of environmental protection means that pollution control, construction of ecological projects, urban greening and other work will receive more material security, thus having a positive impact on controlling environmental pollution. Yubai (2020) confirmed that environmental protection expenditures have a significant negative impact on environmental pollution through the analysis of relevant data in Guizhou Province. Wang Wenqian et al. (2019) also pointed out that increasing green fiscal revenues and green fiscal expenditures will help reduce the level of environmental pollution. Thus, the hypothesis is proposed:

Hypothesis H3: Regions with more investment in environmental protection and governance have better environmental quality and fewer environmental reports from the public.

### 3.4. Level of trade openness

Currently, some local governments have lowered the environmental regulations on foreign enterprises in order to enhance the level of foreign trade and compete for capital and labor resources, leading to environmental degradation. Luo et al. (2017) analyzed the panel data of 270 prefecture-level and above cities in China from 2007 to 2013, and concluded that trade openness exacerbated the degree of environmental pollution. In addition, some scholars hold the view that "trade is beneficial", which believes that international trade activities can promote the increase of income, so that people can better utilize resources and technology to improve the environment, and at the same time, trade openness will bring more advanced finished products and technology, which will have a positive impact on environmental governance. This leads to the hypothesis:

Hypothesis H4a: The more trade-open a region is, the more serious the environmental problems are and the more the public reports on environmental protection.

Hypothesis H4b: The more trade-open a region is, the more advanced its environmental governance resources and technologies are, the better its environmental quality is, and the fewer environmental reports it receives from the public.

## 4. Research Methods

### 4.1. Core variable operationalization

#### 4.1.1. Implicit variable

This paper uses the number of environmental protection reports published by the Chinese government network in each province (autonomous regions and municipalities directly under the central government) to measure public environmental protection reports. Due to the Chinese government network published in the last three years of environmental protection report data does not show the specific situation of each province (autonomous regions and municipalities directly under the central government), this paper selected the data in 2017. 2017, the national environmental protection report management platform received a total of 618,251 cases of telephone reports, micro-channel reports, network reports (excluding Hong Kong, Macao, Taiwan and the Xinjiang Production and Construction Corps), the environmental protection report of the data of the various regions, such as table 1 shows.

**Table 1.** Number of environmental protection reports by province (autonomous regions and municipalities directly under the central government) in China in 2017

| Province | Total (cases) | Province | Total (cases) |
|---|---|---|---|
| Anhui | 15392 | Liaoning | 32511 |
| Beijing | 33370 | Inner Mongolia Autonomous Region | 2869 |
| Fujian | 23600 | Ningxia Hui Autonomous Region | 2500 |
| Gansu | 3016 | Qinghai | 432 |
| Guangdong | 38085 | Shandong | 35708 |
| Guangxi Zhuang Autonomous Region | 12700 | Shanxi | 14604 |
| Guizhou | 2740 | Shanxi | 16688 |
| Hainan | 22531 | Shanghai | 39087 |
| Hebei | 18531 | Sichuan | 21965 |
| Henan | 38955 | Tianjin | 11575 |
| Heilongjiang | 6394 | Tibet Autonomous Region | 28 |
| Hubei | 12046 | Xinjiang Uygur Autonomous Region | 6577 |
| Hunan | 9963 | Yunnan | 4253 |
| Jilin | 4904 | Zhejiang | 21453 |
| Jiangsu | 105601 | Chongqing | 52536 |
| Jiangxi | 7637 | | |

Source: Chinese government website.

#### 4.1.2. Independent variable

First, the gross domestic product (GDP) of each region is used to measure the level of economic development. Larger values indicate higher levels of economic development. Second, the population size is measured by the number of people in each region at the end of the year. The larger the year-end population number, the larger the population size. Third, the number of financial expenditures on energy conservation and environmental protection by each regional government is used to measure

the level of investment in environmental governance. Due to the public nature of the environment, the government will inevitably become the most important body of environmental governance, environmental governance funds come from the vast majority of government financial expenditure, the more government financial expenditure, the greater the investment in environmental protection funds. Fourth, use the total import and export of goods as a proportion of the year's regional GDP to measure the degree of trade openness. The degree of trade openness is a concept that measures the proportion of a country's import and export trade in a given year to the country's total GDP for that year, and the larger the proportion, the higher the degree of trade openness of the region.

Since the impact of the above factors on environmental quality has a lag, this paper chooses the data from the 2016 China Statistical Yearbook to measure the respective variables. Among them, the total import and export of goods uses the statistical caliber of "by domestic destination and source", and the proportion of total import and export of goods to regional GDP is calculated based on the relevant data of China Statistical Yearbook, and the results of the calculation are retained in two decimal places.

### 4.2. Methods of analysis

SPSS linear regression analysis was able to test the relationship between the independent variables and the dependent variable, and the results of the statistical analysis between the respective variables and the dependent variable are shown in Table 2.

**Table 2.** Results of statistical analysis of variables

| | Pearson correlation | Significance (one-tailed) | R | R-squared | Number of cases |
|---|---|---|---|---|---|
| Gross regional product (billion yuan) | .708 | .000 | .708 | .5o1 | 31 |
| Population at the end of the year (million) | .459 | .005 | .459 | .211 | 31 |
| Financial expenditure on energy conservation and environmental protection (billion yuan) | .566 | .000 | .566 | .321 | 31 |
| Total Import and Export of Goods as a Percentage of Regional GDP (%) | .551 | .001 | .551 | .303 | 31 |

Data source: SPSS software.

From the above table, it can be seen that: regional GDP is positively correlated with the number of environmental protection reports, and the correlation is very strong; the number of people at the end of the year is positively correlated with the number of environmental protection reports, but the correlation is weak; energy saving and environmental protection financial expenditure is positively correlated with the number of environmental protection reports and the correlation is strong; the total amount of goods imported and exported accounted for the proportion of regional GDP and the number of environmental protection reports is positively correlated, and the correlation is strong.

## 5. Findings

First, the level of economic development is positively correlated with the number of environmental protection reports, and hypothesis H1b is valid. This indicates that, as a whole, China's economic development is still at the expense of the environment, the more economically developed the region, the more serious the environmental problems, the stronger the contradiction between the environmental needs of citizens and the environmental reality, the greater the number of environmental protection reports.

Secondly, population size is positively correlated with the number of environmental protection reports, and the hypothesis H2a is valid. This shows that the relationship between population size and

environmental quality in China has not yet reached the “inflection point” of the inverted “U” curve, the larger the population in the region, the more human activities such as agriculture, forestry, fisheries, animal husbandry, transportation, sightseeing and all kinds of construction, bringing greater pressure on the local ecological environment. The larger the population, the more human activities such as agriculture, forestry, fishery, animal husbandry, transportation, tourism and various engineering construction, bringing greater pressure on local ecological environment.

Third, the level of investment in environmental protection governance is positively related to the number of environmental protection reports, and hypothesis H3 is not valid. China's environmental protection governance investment has not achieved the expected effect of reducing environmental pollution, which may be due to: (1) the efficiency of environmental protection governance investment needs to be improved, and whether the governance funds have achieved good performance remains to be considered. (2) The lag of environmental protection governance investment is more significant than expected. Regions that have invested more in environmental protection may have more serious environmental problems, and the investment of funds will not improve environmental quality until after a longer period of time.

Fourth, the level of trade openness is positively related to the number of environmental protection reports, and hypothesis H4a holds. This suggests that while the government promotes export trade and economic growth, it has to a certain extent ignored the problems of resource consumption as well as pollutant emissions. At the same time, although the technological progress brought by import trade can improve the environmental situation, at this stage this role is still relatively limited, and there is still room for progress in the introduction of advanced environmental protection technology in China.

## 6. Summary and Implications

This paper finds that China has not yet fully dealt with the relationship between development and the environment, and should continue to promote the improvement of the government's environmental governance capacity from the following aspects, and continuously enhance the role of citizens' environmental participation:

First, we should optimize the economic structure and change the mode of economic development. The government and enterprises should change the idea of exchanging environmental degradation for economic growth, take timely measures to promote the upgrading of industrial structure, focus on the development of industries with high scientific and technological content and low environmental pollution, and promote the recycling of social capital and the effective allocation of resources.

Secondly, we should reasonably plan the gathering of population and moderately control the speed of urbanization. The government should scientifically judge and control the scale of regional population according to the carrying capacity of urban environment. At the same time, it should strengthen the publicity and education on environmental protection as well as the cultivation of professional talents, give full play to the positive role of human capital, and harmonize the relationship between population growth and ecological protection.

Thirdly, it is necessary to increase the investment of environmental governance funds, expand the sources of funds, and improve the efficiency of capital utilization. On the one hand, the government should provide a solid material guarantee for environmental governance. On the other hand, all kinds of social forces should be encouraged to participate in governance and raise funds through multiple channels. It must also pay attention to regular performance evaluation of capital expenditure.

Fourth, the structure of import and export trade should be adjusted to strengthen the learning of advanced governance technology. Highly polluting export sectors should be appropriately compressed, while the threshold for the introduction of foreign capital should be raised and restrictions should be imposed on highly polluting and energy-consuming enterprises. Strengthen the introduction of environmentally friendly production technology and pollution treatment technology, and improve the efficiency of environmental governance with the help of technological means.

Fifth, public participation in environmental protection should be encouraged. Hearings, letters and visits, environmental protection reports and other systems should be further implemented to smooth the channels for the expression of public opinion. For the public to report the problem, the relevant departments should also timely processing, reply, the formation of a good relationship of trust between the government and citizens, to build a government-led, multi-participation model of environmental governance.

## References


[1] Zhang Youguo. The Situation of Peak Carbon and Carbon Neutral Efforts and the Ideas for the Beginning of the Work [J]. Administrative Reform, 2021 (03): 77-85.

[2] Law of the People's Republic of China on Environmental Protection (Revised in 2014) [EB/OL]. BYU Law Information Network, https://www.pkulaw.com/chl/c24f71752129d23dbdfb.html.

[3] Xi Jinping's report at the 19th National Congress of the Communist Party of China [EB/OL]. People's Daily Online, http://cpc.people. com.cn/n1/2017/1028/c64094-29613660.html.

[4] Cao Jing. 12369 Environmental Reporting Management System Project Case [A]. 2016 National Environmental Information Technology and Application Exchange Conference and Annual Meeting of Environmental Informatization Branch of Chinese Society of Environmental Science [C]. Chinese environmental science society environmental informatization branch, "China environmental management" magazine: Chinese environmental science society environmental informatization branch, 2016: 6.

[5] Ren Xiang. Institutional rational analysis of public participation in environmental protection under the perspective of ecological civilization [J]. Ecological Economy, 2020, 36 (12): 218-222.

[6] Chen, Huiling. Analysis of the necessity of public participation in environmental protection [J]. Resource Conservation and Environmental Protection, 2018 (04): 38.

[7] Zhang Zhibin. Public Participation, Regulatory Information Disclosure and Urban Environmental Governance - A Panel Data Analysis Based on 35 Key Cities [J]. Finance and Economics Theory and Practice, 2021, 42 (01): 109-116.

[8] Yue Qinglei. Analysis of factors influencing public participation on satisfaction with environmental governance--a hierarchical model based on CGSS2015 data [J]. Journal of Anhui Administrative College, 2020 (03): 43-51.

[9] Ke Yong, Jiang Qianli, Liu Ji, CHENG Xiaoxia. Discussion on the status quo and countermeasures of environmental pollution letters and complaints in Weinan City [J]. Green Science and Technology, 2019 (08): 117-118+122.

[10] Yu Qiuyue. Research on the relationship between environmental quality and economic development [D]. Jilin University, 2020.

[11] Yilinuer Abudukeremu, Ma Jun. An empirical study on the relationship between economic growth and environmental pollution--Taking Tianjin as an example [J]. China Collective Economy, 2020 (31): 92-94.

[12] Lin Fuxing, Zhang Tingjun. Research on the Influencing Factors of Public Environmental Governance Complaints - Based on the Data Analysis of 12345 Platform in Five Prefectural Cities in Fujian Province [J]. Urban Management and Technology, 2021, 22 (01): 64-68.

[13] Gao Bin. Analysis of the impact of socio-economic factors on urban air quality in China [J]. Bohai Economic Outlook, 2020 (09): 35-36.

[14] Yu Mai. Empirical analysis of the impact of energy conservation and environmental protection expenditure scale on environmental pollution - based on provincial data of Guizhou Province from 2007 to 2017 [J]. Productivity Research, 2020 (03): 98-101.

[15] Wang Wenqian, LI Yanqin, LI Zongyao. Research on the impact of green finance and government intervention on environmental Kuznets curve [J]. Economic Perspectives, 2019 (06): 74-81.

[16] Luo Nengsheng, Jiang Yuqing. Local government competition and opening up to the outside world Impacts on environmental pollution - A case study of 270 cities in China [J]. Urban Issues, 2017 (12): 46-55.