Academic Journal of Management and Social Sciences
ISSN: 2958-4396 | Vol. 2, No. 2, 2023

Chengde City in the Perspective of Sustainable Economic Development Eco-city construction study

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Abstract: Eco-city construction is an overview of the coordinated development of human social development and ecological environment, and sustainable development under the carrying capacity of the natural environment. Both natural, historical and socio-economic conditions are very limited for Chengde, and its economy has always been closed and semi-closed. Economic development is largely dependent on natural conditions and resources, which, together with a weaker socio-economic development base, has led to economic development lagging behind other surrounding areas. And the contradiction between economic development and resources and environment is becoming more and more prominent, which seriously limits the good economic and social development in Chengde. This paper studies the ecological city construction in Chengde from the aspect of sustainable economic development, and elaborates and analyzes the problems in the construction of ecological civilization in Chengde from the aspects of the regional overview of Chengde, the preliminary achievements of ecological civilization construction in Chengde, the index system of ecological civilization construction, and the influence of human production activities on ecological construction, and proposes specific measures to respect the laws of nature, enhance environmental protection awareness, develop green It also proposes specific measures to promote the construction of ecological civilization, such as respecting the laws of nature, enhancing environmental protection awareness, developing green economy and strengthening environmental law enforcement.

Keywords: Economic sustainability; Eco-city construction; Chengde City.

1. Introduction

1.1. Research Background

Since the United Nations Conference on the Human Environment was held in 1927, mankind has been aware of the hazards that traditional development methods have brought to social development and the natural environment, and ecological civilization, environmental protection, circular economy and low-carbon life have become global words. Ecological civilization, environmental protection, circular economy and low-carbon life have become global words.

Ecological civilization is no longer just a word, it is now not only a point of close attention of the times, but also a reality, a goal that we all strive for and want to achieve. Since we entered the new era, our international influence has increased and our international status has been confirmed. On the issue of building ecological civilization, China's understanding and practices have also received close attention from the international community. The 20th Party Congress continued to focus on "building a beautiful China" and "high-quality development", and since the 19th Congress, President Xi Jinping has put forward a large number of words and theories related to ecological civilization based on a broad vision of the evolution of human civilization. The report of the 19th National Congress points out that socialism with Chinese characteristics has entered a new era, which represents a richer connotation of people's needs for a better life, higher material, spiritual and cultural needs, and a stronger desire for a better home.

1.2. Significance of the Study

The natural, historical, social and economic conditions of Chengde are very limited. The natural resources and geographical environment determine the economic development of Chengde, resulting in a weak foundation for socio-economic development in Chengde. The key to the high quality and scientific development of Chengde's economy lies in the ability to strengthen ecological city construction. Eco-city construction can change the way of economic development in Chengde from relying on the consumption of material resources to relying on management progress, technological innovation, and effective recycling. The way of using resources will be changed to resource conservation and efficient use, and ecological environmental protection will be replaced by "pollution first and treatment later" with conservation first and natural restoration. When green and low-carbon development is achieved, better development will be possible.

This paper takes the city of Chengde as the entry point to study and analyze the ecological city construction in Chengde, summarizes the effectiveness and experience of the construction of Chengde as an important ecological city in Beijing, Tianjin and Hebei Province under the perspective of sustainable economic development, and understands the relationship between ecological city construction and sustainable economic development and then how to promote the coordinated development of economy and ecology, and provides a reference and theoretical basis for the continuous promotion of ecological city construction in Hebei Province. It provides valuable reference and theoretical basis for the continuous promotion of eco-city construction in Hebei Province.

1.3. Literature review

In 1995, American geographer Roy Morrison proposed in his book "Ecological Democracy" that the path from "industrial civilization" to "ecological civilization" must be

"ecological civilization. "and also mentioned the concept of "ecological civilization". The concept of "ecological civilization" is also mentioned. From the article "Silent Spring" published in the 1960s, people's awareness of environmental protection and ecology began to awaken. In 1989, the Organization for Economic Cooperation and Development (OECD) implemented the "OECD Work Program on Environmental Indicators" and issued the Core Environmental Indicators System (CEIS) in 1994, which together with the OECD sectoral indicators and environmental accounting indicators form the OECD Sustainable Development Indicators System (SDIS). This system, together with the OECD sectoral indicators and environmental accounting indicators, form the OECD Sustainable Development Indicators System.

Oleg Yanitsky was the first to propose the basic concept of "ecocity" in 1970, based on the results of national research on ecology-related issues. According to Jabaroon (2006), the role of eco-city is to create a good ecological environment suitable for human habitation, which is an umbrella concept covering a range of approaches. Bhatnagar (2010) suggests that building an eco-city should take into account the characteristics of the local environment, improve resource utilization, and reduce waste. Reduce waste. According to Liao (2015), the essence of eco-city is to achieve harmony between human and nature, and only when both human social relations and consciousness reach a certain level, the value of eco-city can be maximized. Coordinating the relationship between economy, society and ecological environment is the key in the development of eco-city (Zhu,2016). Kuang (2017) argues that eco-city is becoming a leading economic and social sustainable development and building eco-city plays an important role in regional development.

The study of ecological civilization in China is relatively late. Domestic research on ecological civilization is at a relatively late stage. Domestic scholar Ye Qianji was the first to propose the concept of ecological civilization, and he thought about ecological issues when studying agricultural development, and proposed to vigorously and actively strengthen the construction of ecological civilization. Since the ecological civilization construction began to be discussed a lot in human society in the 1990s, domestic scholars have also kept pace with the times and constructed the theoretical system of ecological civilization construction from the perspective of their respective disciplines. From the concept of ecological civilization, Qiaoling Huang emphasizes values education, propaganda education, and the need to build ecological civilization demonstration areas in the context of local realities, and to find the characteristics and advantages of development。 Yang Peng, who is a member of the National Committee of the Chinese People's Political Consultative Conference (CPPCC), said that the construction of demonstration zones is a major challenge. Yang Peng proposes that the construction of demonstration zones should be vigorously promoted from the viewpoint of the impact of the construction of demonstration zones on the overall ecological environment of the country and the relative impact on economic development. The model zones should be promoted. Research on the construction of ecological civilization cities from the perspective of sustainable economic development. Yin Xiaoming believes that we should focus on changing the development mode of economy and vigorously developing circular economy. Only by taking the new development path of ecological agriculture and ecological industry can we promote the construction of ecological civilization.

Domestic scholars have different opinions on the connotation of the definition of ecological city. Wang Jagui (2012) proposed that the definition of ecological civilization city includes social, economic and natural aspects, and is a sustainable civilized city where human society, natural ecological environment and economic development co-exist in a coordinated manner under human-led. Li Tie (2013) argues that an ecological city is an efficient allocation of resources based on human needs as the starting point, achieving a high degree of coincidence of population language infrastructure rather than simple material accumulation and the appearance of ecology. Zhao Qiguo (2016) gives the connotation of ecological civilization from the perspective of ecology and analyzes the necessity of ecological construction . Lu Feng (2017) proposed that the important way of ecological civilization construction is technological innovation and system construction, and that the ideology should be fundamentally changed. In recent years, in the process of research on ecological cities in China, it is generally believed that the construction of ecological cities should follow the principles of sustainable development and the coordinated development of human and nature, attaching importance to the coordination of urban development and ecological environment, and putting forward various perspectives on the construction of ecological cities. Qiu Baoxing (2013) proposes that the construction of an ecological city is a process of integrating each unit of the city and using the idea of "symbiosis" to create a city that conserves resources, recycles materials, and follows ecological principles. Cao Jin (2016) suggests that in order to improve the capacity of ecological city construction in China, it is necessary to integrate the policies of creating new cities and establishing the Silk Road Economic Belt into the modern ecological city construction, so that the policies can play a key role. Li Xun et al. (2018) argued that because of the complex topography and vast territory in China, the diversity of urban characteristics should be followed in the development of low-carbon city construction planning, and the distinctive ecological cities should be targeted according to the geographical and geological conditions, climatic conditions and resources of different regions.

We can see that the foreign ecological civilization city research is relatively early and mature, but because most of their research backgrounds are developed countries, it is known that the development situation of developed countries is different from that of developing countries, so we cannot completely copy the research methods of developed countries for ecological civilization construction, and their analysis data and some practices and experiences are not good enough to solve our practical problems. We can only use them as examples and references for study. At present, domestic research on the construction of ecological civilization demonstration areas, especially for specific areas, especially the less developed areas around the capital, there is a lack of in-depth analysis of ecological protection measures.

2. Overview of Chengde City

2.1. Ecological profile

Chengde (115°54′E-119°15′E, 40°11′N-42°40′N)is located in the northeastern part of Hebei Province, which is the transition zone between North China and Northeast China,

and between the North China Plain and Inner Mongolia Plateau.Chengde is located in the east of Tangshan, Qinhuangdao and Liaoning, in the south of Beijing and Tianjin, in the west of Zhangjiakou, and in the north of Inner Mongolia, Xilin Gol League and Chifeng, with the unique geographical position of "one city even five provinces". The area of 39,500 square kilometers, accounting for one-fifth of the province's area, is the largest prefecture-level city in Hebei Province, rich in ecological resources.

(1) Geological features

Chengde is located at the connection between the northern edge of the China-DPRK land platform and the southern edge of the Mongolian Trough, with diverse geological formations, among which the prominent regional geological feature is the Chinese standard Alpine fold tectonics, but also due to the intrusion of contemporaneous or late granite, causing the phenomenon of small basins and geological faults in local areas.

Chengde City is located in the transition zone from the North China Plain to the Inner Mongolia Plateau, with complex topography and large mountainous area, the terrain slopes from northwest to southeast. The northwestern part of the city is the southern edge of the Inner Mongolia Plateau - the Damshang Plateau, with an average altitude of 350 m. The highest mountain in the city is Mount Wuling, with an altitude of 2118 m. The urban area is dotted with Danxia landforms, which are rare in the north, and the more famous ones are Mount Shuangta and Chime Peak.

(2) Climate

The climate of Chengde is characterized by high temperatures in summer and low temperatures in winter compared to other regions of China, with a large temperature difference between day and night, and a temperate monsoonal mountainous climate. Because of its northwest to southeast sloping terrain, the difference between the north and south of the climate is more obvious. Specifically, the distribution of temperature gradually decreases from south to north, with the temperature rising in February and decreasing until August. January is the coldest month and July is the hottest month, with an annual average temperature of 9°C. The seasonality of precipitation is obvious, and it is a typical summer rainfall type climate zone, with an average precipitation of 512 mm in the past 50 years.

Temperature. The city's annual temperature difference between 32 to 35 ℃, the north-south difference is not large, and the same latitude areas, the annual difference is relatively large.

Precipitation. The city's annual precipitation of 450 mm to 850 mm, the difference in precipitation distribution is obvious, the overall trend of decreasing from southeast to northwest. There are three relatively rainy areas, namely the western Jinchang and Hongqi line, the eastern ten rivers, and the southeastern eight families.

frost and frost-free period in different areas of the distribution of the number of days.

2.2. Socio-economic and development status

(1) National Economy Overview

The GDP of Chengde City in 2019 was 147.1 billion yuan. Among them, the added value of the primary industry was 29.8 billion yuan, up 4.5 percentage points from the previous year; the added value of the secondary industry was 48.85 billion yuan, up 1.3 percentage points from the previous year; and the added value of the tertiary industry was 68.4 billion yuan, up 11.7 percentage points from the previous year. The value added of the three industries accounted for 20.3:33.2:46.5 of the gross regional product. but Chengde city has been in a disadvantaged position in the economic development of the urban areas in Hebei province, selected Chengde city 2011-2019 GDP ranking in 11 urban areas in Hebei province, as shown in Figure 1, we can see that the economic situation of Chengde city has been ranked at the bottom, of which in 2018 Chengde's GDP value even fell to the bottom position.

Figure 1. GDP ranking of Chengde City in Hebei Province from 2011 to 2019

(2) The basis for sustaninable economic development in Chengde

The economic growth of Chengde city is generally steady to good compared with itself, which provides a constant impetus for the scientific and efficient economic development of Chengde city. As can be seen from Figure 2-4, since the economy of Chengde has entered the new normal, the regional GNP has risen from 107 billion yuan in 2011 to 171.73 billion yuan in 2018, an increase of 6.4% over the previous year, in fact, overall economic growth has become an important driving force for sustainable economic development.

Along with the improvement of economic level in Chengde, the structure of three major industries has been improved. As shown in Figure 2, the development momentum of the tertiary industry is the strongest, and the growth rate is always above 8%, but the economic structure has not changed the situation that is jointly driven by the primary and secondary industries.

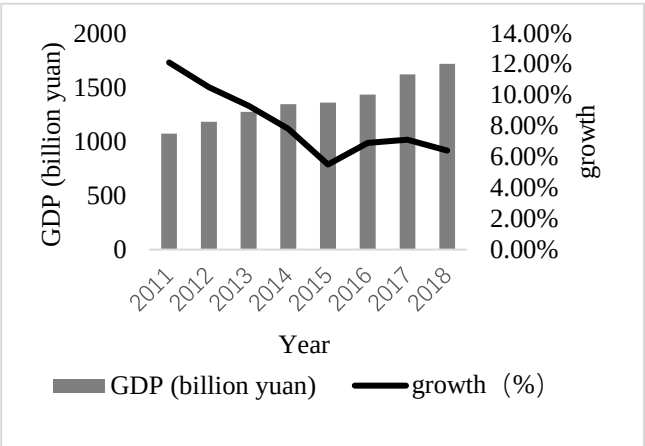

Figure 2. GDP value and growth rate of Chengde from 2011 to 2018

In 2019, there were 365 industrial enterprises above the scale, and the added value of industry increased by 579 million yuan compared with the same period last year. Among them, the value added of mining industry increased by 1.575

billion yuan year-on-year compared with the same period last year; the value added of manufacturing industry decreased by 380 million yuan year-on-year compared with the same period last year; the value added of electricity, heat and other supply industries increased by 248 million yuan year-on-year compared with the same period last year; in light and heavy industries, the value added of light industries decreased by 251 million yuan year-on-year compared with the same period last year, and the value added of heavy industries increased by 984 million yuan year-on-year.

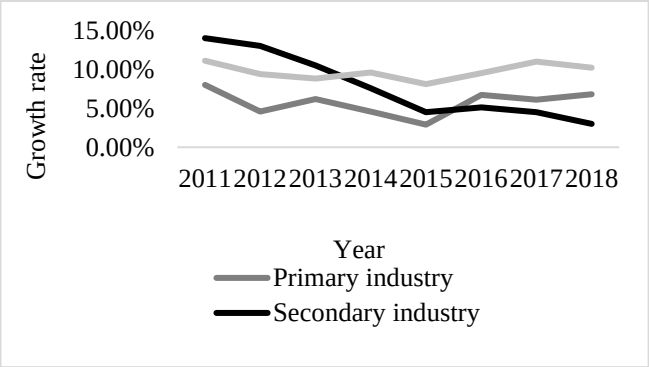

Figure 3. Growth rate of primary, secondary and tertiary industries in Chengde from 2011 to 2018

The overall per capita disposable income of rural households and urban households in Chengde also shows a trend of annual increase, and the situation is largely preferred. As shown in Figure 3.

3. An empirical study of Chengde

3.1. Data Source

By consulting the China Statistical Yearbook, the Chengde Statistical Yearbook and the Chengde National Economic and Social Development Bulletin, and by consulting the official website of the Chengde municipal government and the official website of the Chengde Bureau of Ecological and Environmental Quality, we collected data on the construction of the index system of ecological civilization in Chengde, including the total value of GDP, per capita disposable income in rural towns, industrial sulfur dioxide emissions, industrial wastewater emissions and other 13 secondary indicators data, so as to construct the ecological civilization construction index system of Chengde city, as shown in Table 1, due to the outbreak of the new crown epidemic in 2019, in order not to affect the research results so the data from 2011-2018 were selected for calculation.

Table 1. Index system of eco-city construction in Chengde city.

	Tier 1 Indicators	Serial number	Secondary indicators
Ecological city construction index system	Economy Transformation	1	GDP (billion yuan)
		2	Per capita disposable income of rural households (yuan)
		3	Urban household disposable income per capita (yuan)
	Social Harmony	4	Number of beds in medical and health institutions (10,000)
		5	Number of days to meet urban air quality standards
		6	Industrial sulfur dioxide emissions (tons)
	Environment Friendliness	7	Forest cover (%)
		8	Greening coverage of built-up areas (%)
		9	Annual average PM2.5 concentration (μg/m3)
		10	Industrial smoke (dust) emissions (tons)
		11	Total industrial wastewater discharge
	Space Optimization	12	Urbanization rate (%)
		13	Fiscal revenue (billion yuan)

Serial Number/Year	2011	2012	2013	2014	2015	2016	2017	2018
1	1070	1180.9	1272.09	1342.6	1358.6	1432.9	1618.6	1717.3
2	4935	5546.2	6225.6	7163	7923	8736	9682	10804
3	15037.6	16832.2	20636.8	20983	22885	24856	27042	29557
4	1.3455	1.3455	1.6057	1.75	1.82	1.97	2.13	2.21
5	349	350	249	249	260	200	291	278
6	87360	87360	72424	71938	72938	55393	47879	35048
7	41.3	54	54.8	55.8	56	56.7	56.67	57.67
8	39.06	39.95	39.75	41.02	41.91	42.89	43.57	43.65
9	55	55	54	52	43	40	35	32
10	47499	47499	28127	32032	76895	50907	40963	35066
11	1715	1715	1421	1638	1560	1373	1384	1363
12	40.71	41.92	43.27	44.5	46.8	49	50.7	52.07

3.2. Method

3.2.1. Data Standardizatio

Evaluation indicators are usually composed of different scales. In order to eliminate the scale to achieve comparison between indicators, it is necessary to standardize the indicator data, so as to avoid the disadvantage of not being able to compare due to the different scales of each indicator, and to evaluate each indicator more reasonably, as shown in Table 2.

Positive indicator treatment formula.

$$x_{ij} = \frac{X_{ij} - min\, X_j}{max\, X_j - min\, X_j}, (i = 1, 2, \dots, n; j = 1, 2, \dots, m)$$

Negative indicator treatment formula.

$$x_{ij} = \frac{max\, X_j - X_{ij}}{max\, X - min\, X_j}, (i = 1, 2, \dots, n; j = 1, 2, \dots, m)$$

Table 2. Standardized value of ecological city construction system index in Chengde city.

Ecological city construction index system/Year	Standardized values			
	2011	2012	2013	2014
GDP (billion yuan)	0.012232955	0.013502434	0.017542699	0.01863942
Fiscal revenue (billion yuan)	0.001740577	0.001993557	0.002634466	0.002706841
Proportion of education expenditure to fiscal expenditure (%)	0.000164088	0.000205183	0.000262409	0.000247997
Urbanization rate (%)	0.000450608	0.000464459	0.000575296	0.000594276
Resident consumption level(yuan)	0.092213583	0.109315494	0.148398771	0.161368573
Industrial sulfur dioxide emissions (tons)	1	1	1	1
Forest cover (%)	0.000457362	0.000602739	0.000734501	0.00075136
Greening coverage of built-up areas (%)	0.00043172	0.000441908	0.000526692	0.0005459
Annual average PM2.5 concentration (μg/m3)	0.000614186	0.000614186	0.000723454	0.000698535
Industrial smoke (dust)emissions (tons)	0.543708632	0.543708632	0.388352174	0.445258823
Total industrial wastewater discharge	0.019616311	0.019616311	0.019598831	0.022745834

2015	2016	2017	2018
0.017644998	0.025833244	0.033763068	0.048913423
0.002102657	0.002618294	0.003654583	0.006097173
0.000236042	0.000323157	0.000366565	0.000487397
0.000584967	0.000849054	0.001014477	0.00142198
0.15826085	0.231572332	0.299223195	0.449717215
0.948538999	1	1	0.99948665
0.000704614	0.000988066	0.001139172	0.001581689
0.000521373	0.000738748	0.000865554	0.001181846
0.000535548	0.000686573	0.000686553	0.000849594
1	0.919012158	0.855546112	1
0.020264216	0.024751842	0.028862998	0.038808982

3.2.2. Data normalization process

Treatment formula.

$$P_{ij} = \frac{X_{ij}}{\sum_1^n X_{ij}}, (i = 1, 2, \dots, n; j = 1, 2, \dots, m)$$

Table 3. Normalized value of eco-city construction system index of Chengde City

Serial number	2011	2012	2013	2014	2015	2016	2017	2018
1	0.0073089	0.0080665	0.0086894	0.009171	0.0092804	0.009788	0.0110564	0.01173058
2	0.0010478	0.0011988	0.0013143	0.001342	0.0011168	0.001004	0.0012097	0.00147545
3	0.0001071	0.0001316	0.0001408	0.000134	0.0001364	0.000136	0.0001344	0.00013183
4	0.0002780	0.0002863	0.0002956	0.000304	0.0003197	0.000335	0.0003463	0.00035568
5	0.0550359	0.0652412	0.0734246	0.079306	0.083138	0.087633	0.0978721	0.10772897
6	0.5967410	0.5967410	0.4947158	0.491396	0.4982269	0.37838	0.3270532	0.23940683
7	0.0002821	0.0003688	0.0003743	0.000381	0.0003825	0.000387	0.0003871	0.00039393
8	0.0002668	0.0002728	0.0002715	0.00028	0.0002863	0.000293	0.0002976	0.00029816
9	0.0023839	0.0023907	0.0017009	0.001701	0.001776	0.001366	0.0019878	0.00189897
10	0.0003756	0.0003756	0.0003689	0.000355	0.0002937	0.000273	0.0002391	0.00021858
11	0.3244574	0.3244574	0.1921307	0.218805	0.5252565	0.347737	0.2798112	0.23952979
12	0.0117148	0.0117148	0.0097066	0.011189	0.0106561	0.009379	0.0094539	0.00931041

3.2.3. Information entropy

The entropy value method is applied to calculate the information entropy of indicators, and then the weights of each indicator are derived, as shown in Table 4.

Information entropy formula.

$$E_j = -\frac{1}{\ln n}\sum_{i=1}^{n} P_{ij} \ln P_{ij}, (i = 1,2, \dots, n; j = 1,2, \dots, m)$$

3.2.4. Weights

The weights of each indicator in the index system were calculated as shown in Table 3-5.

Weighting formula.

$$W_i = 1 - E_i/9 - \sum E_i$$

As can be seen from Table 5, the weights of total industrial sulfur dioxide emission and total industrial smoke (dust) emission in Chengde are 0.523607953 and 0.354431067

respectively, which indicates that industrial sulfur dioxide emission and industrial smoke (dust) emission will have a greater impact on the construction of ecological civilization in Chengde: while the weight of GDP is only The weight of GDP is only 0.010853447, which accounts for a very small proportion of the indicators affecting the construction of ecological civilization in Chengde, indicating that the influence of this indicator of GDP on the construction of ecological civilization in Chengde is relatively small.

It should be noted that in 2014, Chengde was the only city in the Beijing-Tianjin-Hebei region where the air quality index decreased rather than increased, and the sulfur dioxide emissions in Chengde also increased from 2013, and was interviewed by the Ministry of Environmental Protection and listed on 17 environmental issues, but then decreased after improvements. As shown in Table 6.

Table 4. Information entropy of eco-city construction index system in Chengde City

Indicators	Information entropy	Indicators	Information entropy	Indicators	Information entropy
GDP (billion yuan)	0.03131547	Resident Consumption level (yuan)	0.270812259	Greening coverage of built-up areas(%)	0.000945191
Fiscal revenue (billion yuan)	0.004049023	Number of beds in medical and health institutions (10,000)	0.006546863	Annual average PM2.5concentration (μg/m3)	0.006341153
Proportion of education expenditure to fiscal expenditure (%)	0.000438611	Industrial sulfur dioxide emissions (tons)	1.510766979	Industrial smoke (dust) emissions (tons)	1.022640601
Urbanization rate (%)	0.001051076	Forest cover (%)	0.001233306	Total industrial wastewater discharge (tons)	0.034665542

Table 5. Index system weights of eco-city construction in Chengde City.

Indicators	Weights	Indicators	Weights	Indicators	Weights
GDP (billion yuan)	0.010853447	Resident consumption level (yuan)	0.093859248	Greening coverage of built-up areas(%)	0.000327588
Fiscal revenue (billion yuan)	0.001403327	Number of beds in medical and health institutions (10,000)	0.000370387	Annual average PM2.5 concentration (μg/m3)	0.000361354
Proportion of education expenditure to fiscal expenditure (%)	0.000152016	Industrial sulfur dioxide emissions (tons)	0.523607953	Industrial smoke (dust) emissions(tons)	0.354431067
Urbanization rate(%)	0.000364286	Forest cover (%)	0.000427444	Total industrial wastewater discharge (tons)	0.012014529

Table 6. Average emissions of major pollutants in Chengde City, 2011-2018.

Year / Contaminants	2011	2012	2013	2014	2015	2016	2017	2018
Sulfur dioxide (mg/m3)	0.045	0.037	0.037	-	-	-	0.017	0.013
Nitrogen dioxide (mg/m3)	0.035	0.032	0.036	-	-	-	0.035	0.034
Respirable particulate matter (mg/m3)	0.055	0.061	-	-	-	-	0.083	0.078

4. Conclusion and discussion

4.1. Conclusion

Based on the ecological city construction in Chengde, this study analyzes the relationship between the ecological city construction and economic development in Chengde from 2011 to 2018 in conjunction with the established index system of the ecological city construction in Chengde, and analyzes the factors affecting the index system the main findings are as follows.

1). Among the 13 evaluation indexes selected, the 3 indexes of industrial sulfur dioxide emissions, industrial wastewater emissions and industrial smoke (dust) emissions have a relatively obvious impact on the construction of ecological civilization in Chengde.

2). From the changes of GDP growth and sulfur dioxide emission values in Chengde, the ecological civilization construction and air quality aspects of Chengde in recent years should be well coordinated and not lose sight of the other.

3). The forest coverage rate of Chengde City shows a trend of increasing year by year in the whole system, and its proportion keeps increasing, which indicates that the ecological civilization construction in this area shows a positive trend.

4.2. Problems

Fragile ecological environment. The natural geography of Chengde City, the natural ecosystem forms a more homogeneous structure, and the self-regulation ability is not good enough, and the ecosystem as a whole is fragile, so it cannot withstand natural disasters and over-exploitation. If forests, grasslands and other vegetation are destroyed, it will be difficult to restore the original appearance in a short period of time.

The contradiction between resource environment and economic development is outstanding. The economic development of Chengde City relies heavily on natural conditions and natural resources, resulting in a weak foundation for economic and social development and a relative lack of total economic development. In 2019, it achieved a GDP of 147.1 billion yuan, ranking last in Hebei Province. Long-term unequal development within the region has resulted in obvious economic and social differences within the region and prominent regional poverty. Chengde is in the upwind position of Beijing, Tianjin and Tang area, which is the ecological barrier of the North China Plain, the source of water supply, water connotation area and wind and sand for the city. If the relationship between economic development and natural environment is not well coordinated and causes conflicts, it will not only bring disadvantages to Chengde itself but also put the whole Beijing-Tianjin-Tang in an awkward development situation.

Mining environment protection is heavy task. As one of the major cities of mineral resources in our province, Chengde City is rich in mineral resources. A total of 101 kinds of minerals have been found in the city, including 59 kinds that have been explored and have reserves, and 52 kinds that have been developed and utilized. There are mainly iron, gold, silver, lead, zinc, molybdenum, etc. Mine development will cause a large amount of mine waste, waste rock, wastewater, dust, etc., and these things will make the vegetation, soil and water bodies and ecological landscape on the mines are damaged and polluted to varying degrees, which will cause the task of restoration and management of the mine ecological environment becomes very difficult.

Ecosystem degradation and reduction of service funtions.

1.Low proportion of natural forest secondary forest.The natural forest ecosystem in Chengde is immature, the utilization rate of the land suitable for afforestation is low, the artificialization of forest land is serious, there are few types of plantation forests, most of the broad-leaved forests are poplar, willow, elm, some birch trees in the mountainous areas, and few other tree species. Therefore, the overall ecological function of the forest ecosystem of the main natural system in Chengde is relatively weak, and many ecological functions are not fully utilized, so it will take a long time for the ecosystem to develop into a virtuous cycle.

2. Degradation of grassland ecosystems exists.Affected by excessive human production activities and the drier and windy natural environment, the grassland in Chengde area is now sparsely vegetated, the soil is degraded, sandy and alkaline, the process of wind and water erosion is increasing, and the ecological environment is gradually deteriorating. Currently, 42.7% of the available grassland area belongs to degraded grassland, among which Fengning and Weichang have the largest area of degraded grassland, leading to the continuous expansion of desertification, and the large area of sandy substrate is exposed in some areas of the agricultural-pastoral intersection. The gradual degradation of grassland will not only hinder the development of natural ecosystem, but also relate to the whole grassland ecosystem service function.

3, the natural wetland area is small, wetland ecological regulation function is weak. Human actions in recent years such as drought, excessive reclamation, modification of natural wetlands, and blind exploitation of groundwater have led to a gradual decrease in the area of natural wetlands. The construction of water conservancy and road projects has resulted in the wetland area becoming smaller or even disappearing. Coupled with the small size of the wetland ecosystem in Chengde City itself, the regulatory capacity is also insufficient, especially in these areas of the dam plateau and the transition zone between agriculture and animal husbandry, the wetland system is severely reduced and destroyed, which puts biodiversity at risk and obviously makes ecological functions and benefits much less effective than before.

4. Simple structure of farm ecosystem, low crop yield and poor resistance to stress. The climate of Chengde is characterized by short daylight hours, large temperature differences between day and night, and seasonal precipitation. Because of the differences in the conditions of the mountainous and hilly areas, production technology and economic conditions, most of the farmland ecosystems do not have a diverse component structure, and fewer crops are grown to support the land. The lack of a diverse component structure results in low yields and less resilience than natural ecosystems, making them ecologically unstable.

Increased human impact on the ecological environment

1.The impact of mineral resources development on the ecological environment. Chengde City is rich in mineral resources, and the key industry of Chengde City is the development of mineral resources, but the development of mining industry will cause many problems, such as the production of "three wastes", which will lead to soil erosion in mining areas, induce geological collapse, landslides, and other geological disasters, and damage the ecological environment. In addition, due to the low level of technology of individual enterprises, the low utilization of mineral resources in the mining process, it is easy to cause secondary pollution of water and soil.

2.Ecological and environmental impact of road traffic construction. The construction of road infrastructure has had a positive impact on the socio-economic development of Chengde City and has also caused side effects of varying degrees, mainly:

(1) It takes up land and agricultural land, and most of it is high-quality arable land.

(2) Destruction of vegetation and soil erosion.

(3) The water system is divided, causing changes in hydrological processes.

(4) The wildlife habitat was, causing inconvenience to wildlife.

4.3. Suggestions

Strengthen ecological environment protection.

Ecological environmental protection must adhere to the viewpoint of coordinated development of ecological protection and construction with the economy, and firmly establish the environmental protection consciousness of protection first and prevention second. From the root cause of ecological damage, we should change the ecological damage and predatory exploitation of resources caused by the original

sloppy economic development model. Focus on solving the problem of repeated reclamation of grasslands, excessive reclamation for grazing, unreasonable logging, waste of water resources and other man-made ecological damage, and do a good job of environmental protection publicity, improve the quality of humanities.

Respect the law of nature and focus on natural recovery.

Continue to adhere to the environmental protection policy of prioritizing protection and natural restoration, so that the ecological environment can be significantly improved.

1.grasp the historical opportunity of Beijing-Tianjin-Hebei integration, vigorously promote the construction of Beijing-Tianjin-Hebei water-conserving functional areas, and continue to manage the problem of soil erosion.

2.Strictly implement the no-grazing policy, make use of the second phase of the Beijing-Tianjin Wind and Sand Source Control Project and the existing national policy on restoring grassland ecology, and manage the problem of grassland degradation on the ground.

3.Make afforestation a key project, and expand afforestation in ecologically fragile areas such as sandy land and severe soil erosion. Increase supervision and management of indiscriminate logging and forest land occupation, and crack down on all kinds of forest-related illegal and illegal grazing and other acts.

Development of green low-carbon industries.

1.adhere to the upgrade and transformation of traditional industries and the cultivation and expansion of new industries, accelerate the implementation of environmental protection "faucet" system, and promote the development of industrial structure in the direction of green low-carbon cycle.

2.continue to promote supply-side structural reform, the strict implementation of the main functional areas and environmental access system, to resolve excess capacity, the development of energy-saving and environmentally friendly industries. Strengthen school-enterprise cooperation and the introduction of advanced technology and major projects at the same time development, and actively enhance the level of products and services, and strive to establish an environmental protection industry cluster that combines consulting services, environmental protection equipment manufacturing, environmental protection engineering construction, and operation and maintenance of environmental protection facilities.

3.vigorously promote energy conservation and emission reduction projects, industrial boiler energy-saving transformation and coal to gas project. And promote the development of industrial solid waste to scale and high value-added direction.

Promote comprehensive improvement of the water environment.

1.vigorously promote measures to protect water quality. A comprehensive survey, in-depth analysis of the main factors of river pollution, study a number of guiding programs, and strongly promote the construction of infrastructure, river restoration, industrial standards, rural surface treatment, drinking water source protection and other specific measures. At the same time, the start of the monthly national and provincial examination section for 2 early warning monitoring and 1 tracking monitoring work, and continue to strengthen the "ten all" extraordinary remediation measures to ensure that the river water quality steadily improved.

2.Actively promote the construction of environmental infrastructure. For sewage, garbage treatment capacity is not enough basic shortcomings, reported to the municipal government to set up pollution control work to promote the Office.

3.strengthen the protection and governance of drinking water source protection zones. Through the establishment of signage, warning signs and other methods in the water source protection zone for standardized management, while the existence of environmental problems of centralized drinking water sources to investigate and rectify.

Strengthen environment enforcement. From time to time to take a variety of forms, such as random checks, unannounced visits, cross law enforcement, etc., to focus on key areas for special rectification. At the same time, set up a special working group, the implementation of a special team to deal with, list management, double-checking, signing at each level and other work mechanisms, do their best to rectify the problems assigned to ensure that the problems assigned to be solved in a timely and effective manner.

Strengthen public awareness of environment protection.

1.Strengthen ecological civilization education. Continue to promote ecological civilization education for primary and secondary school students, organize publicity activities on protecting the environment and promoting ecological civilization, and call on the public to pay attention to environmental protection and participate in environmental protection.

2.Strengthen the disclosure of environmental information. Use websites, WeChat and other channels to publicize environmental information such as environmental quality, administrative licenses and penalties, and joint radio, television, newspapers and other media to publicly expose typical illegal cases and improve the public's rational understanding of environmental protection.

3.Increase the inspection and supervision of environmental petition cases.

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