The Current Situation and Challenges of Global Carbon Emission Governance

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Abstract. Global climate change is now the most important environmental problem facing the current human need and challenge, and carbon emissions is a very important part of climate change in the, in the world today is indeed a large part of climate change caused by carbon emissions, so this article will research the current climate change under the perspective of international carbon governance issues of current situation and difficulties in major countries in the world. So as to provide countermeasures and suggestions for the next international action and better promote the sustainable development of mankind. This paper mainly uses the SPSS statistical software data correlation analysis, significance analysis and overall descriptive analysis of the research methods. Through study, carbon emissions will indeed have a huge impact on global climate change, carbon emissions from all over the world in different period by the time of the international politics, national and regional economic development, global health and safety, national historical development process and the influence of many factors, such as national policy. At the same time in the foreseeable future, the total carbon emissions of all countries and the world will show a downward trend, and all countries will make concerted efforts to tackle global climate change.

Keywords: Climate change, Carbon emissions, Correlation, Major countries, Cooperative governance.

1. Introduction

1.1. Research Background

The study of global climate change and the governance of carbon emissions should begin with the basic concepts of climate governance and carbon emissions. As a form and dimension of governance, global climate governance is a special form and direction of global governance, which has the basic characteristics of global governance, and has its own characteristics and development history compared with other forms of national governance and other dimensions of global governance.

Global climate governance, as a common concern of geographers, economists, political scientists and anthropologists, is an important part of global governance, and is a joint effort of subjects at multiple levels and in various regions to address climate change on a global scale. The subjects respond to the global climate change crisis by adopting mitigation, adaptation, financial support and technical support around the climate governance guidelines established in the signed climate treaties and guided by the multilateral action framework of the United Nations [1].

Carbon emissions is the abbreviation for greenhouse gas emissions, and since the most important component of greenhouse gases is carbon dioxide, the term "carbon emissions" is generally used to refer to the emission of greenhouse gases.With the early industrial revolution, the economy of human society began to step in a stage of rapid development, which was accompanied by a enormous consumption of traditional fossil energy sources such as coal, oil, natural gas. These traditional fossil energy sources release large amounts of greenhouse gases, including carbon dioxide, ozone, and methane during the combustion process. Such an increase in "carbon emissions" is the main cause of climate warming and global climate change. Although the importance of energy use and environmental protection has been gradually recognized since 2000, the increase in greenhouse gas concentrations caused by past actions has become almost irreversible.

On October 5, 2021 local time, the Royal Swedish Academy of Sciences announced the three winners of the 2021 Nobel Prize in Physics: Japanese American scientist Syukuro Manabe, German scientist Klaus Hasselmann, and Italian scientist Giorgio Parisi, for their work in seemingly disorderly situations to discover order and help explain and predict complex natural forces that expand our understanding of climate change. Hassman told the Associated Press that he "would rather not have the Nobel Prize than global warming. Sookuro Manabe, on the other hand, said it would be "1,000 times easier" to figure out the physics behind climate change than to get the world to act [2].

1.2. Research Questions and Significance

Therefore, in today's increasingly serious global climate change problem, this paper will study the current situation of global carbon emissions, an important factor contributing to climate change, its correlation between the state of economic development and the output value of various industries, and its governance dilemma and future development trend, in order to provide some suggestions and countermeasures for future cooperation and global governance of climate change, and better promote the sustainable development of human beings and the whole earth.

1.3. Literature Review

Among the previous studies by Chinese authors, the latest frontier is to study how to give full play to the role of NGOs while China's position in the evolution of the global carbon emission pattern is increasingly prominent, and how to enhance the capacity and level of NGOs' participation in international climate governance and their influence in issue setting, discourse control, and project operation while governments are formulating policies and playing a role [3]. In the context of President Xi Jinping's goal of achieving carbon neutrality by 2060, China should also study how to adhere to its strategic determination to address climate change in the face of the new situation and new requirements, and how to coordinate the two major situations domestically and internationally, and synergistically promote climate change and ecological and environmental governance, and climate change and high-quality economic development, so as to provide strong support for achieving this goal [4]. At the same time, there is also an analysis of the "common but differentiated" responsibility construction and difficulties elimination of international carbon emission governance in the context of carbon neutrality, as well as the design of carbon emission management mechanisms and policies in the cross-regional carbon emission trading market for a certain city or region from a domestic perspective, such as effective incentive and penalty policies and industrial transformation policies [5-6].

In addition, in earlier studies, Chinese scholars have also studied the correlation between economic growth and carbon emission management in China as a whole or in a particular region or city, as well as the correlation between industrial output and energy consumption in China, the correlation between factors influencing carbon emission intensity in China, and more specifically the correlation between regional FDI and carbon emissions, daily consumption and carbon emissions, and carbon emissions from agriculture and carbon emissions from various energy sources [7-9].

In general, there is a lack of research on the correlation between economic development, industrial output value and carbon emissions in the world's major countries as a whole and in a time series, and on this basis, combined with the interpretation of these data phenomena in conjunction with national policies, and the current situation and dilemma of carbon emission governance in major countries and in the world behind these phenomena, but this is just the significance of the implementation of this study.

2. Method

2.1. Research Subjects

Next, this paper will investigate the current trends of carbon emission intensity of major countries in the world through the comparison of data and correlation studies, then conduct a comparative

analysis, involving the world's three largest countries, the United States, China and Russia, representative developed countries Japan, the United Kingdom, Germany and France, and important emerging developing countries Brazil, India and South Africa.

2.2. Research Tools and Methodology

While the level of wealth per capita or GDP per capita is an important indicator of good economic development, the direct correlation between total GDP and carbon emissions of each country provides a better and more intuitive picture of each country's attitude toward economic development and environmental protection and the changing pressure of the size of the economy on the environment in the process of development. Therefore, this paper will study the correlation between the two sets of variables, mainly starting from two aspects: the total GDP and carbon emission of each country and the output value of each industry and the carbon emission of energy consumption of that industry, and analyzing them in the context of the relevant policies of each country in the development process. Among them, the total GDP of each country and the output value of each industry are the independent variables, the total carbon emissions and the carbon emissions of energy consumption of each industry are the dependent variables, and the statistical software used for the correlation study is SPSS 26.0.

2.3. Research Data Sources

The data used in this article come from the Macro View Club global economic database, CEIC global data network, China National Bureau of Statistics, Oak Ridge National Laboratory, the World Bank database and Global Carbon Atlas, all of which are officially verified authoritative databases.

Considering the different stages of industrialization development and urbanization development of the selected countries, and analyzing the availability of data for each variable, this paper studies the correlation between GDP and carbon emissions for each country for the period 1960 to 2020, while the correlation between the output of different industries and their carbon emissions from energy consumption for each country for the period 1990 to 2019.

Figure 1 shows the trend graph of the total GDP of the 10 countries studied from 1960 to 2021.

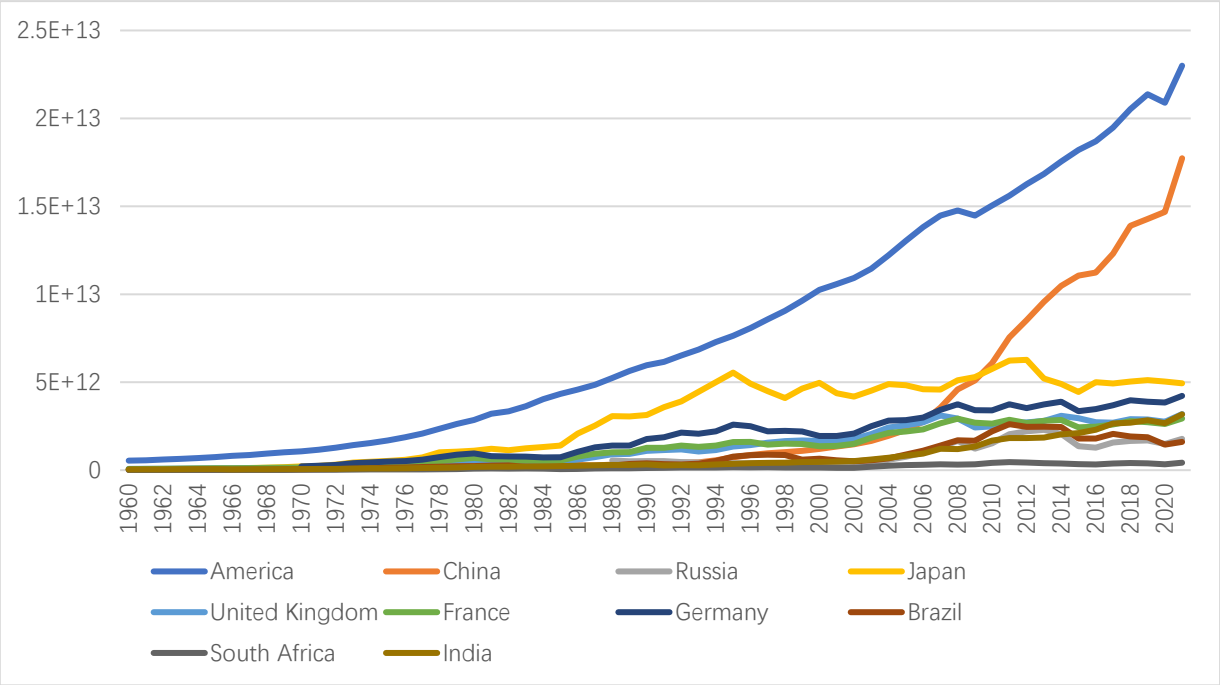


Fig. 1 Total GDP of Each Country (1960-2021) [10] Unit: Dollar

Figure 2 shows the specific value and change trend of total carbon emissions of 10 countries from 1960 to 2021 as the main research object of this paper.

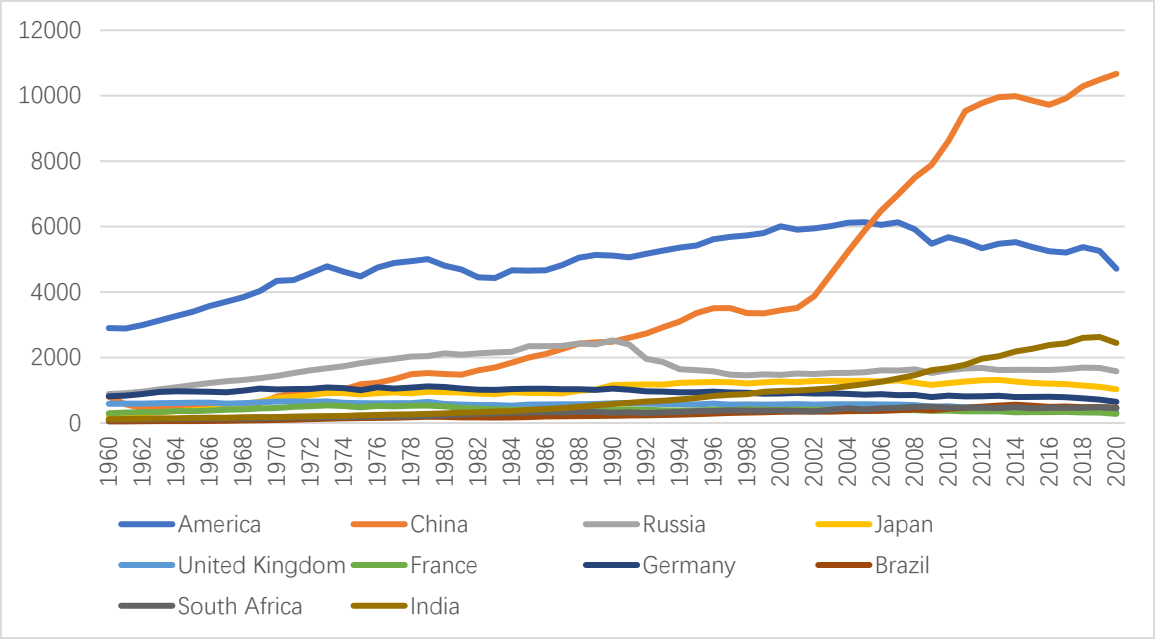


Fig. 2 Total Terrestrial Carbon Dioxide Emissions (1960-2021) [11] Unit: Metric Ton

The next step will perform a formal correlation analysis.

3. Results

The specific values of each variable are entered sequentially into the corresponding positions according to the time series, and the corresponding correlation characterization data are finally calculated by SPSS.

3.1. The Correlation Between GDP and Carbon Emissions in Each Country

Next the author is going to show the result of correlation analysis on annual time series data of GDP and total carbon emissions of each country and analyze. However, due to space limitation, it's only shown the experimental data and results of the United States, the most representative country with the highest overall strength in the world (see Table 1), in screenshots, and for other countries, the author will directly analyze.

Table 1. The Correlation Between U.S. GDP, CE and Time

		U.S. GDP (Unit: billion ＄)	U.S. Carbon Emissions (Unit:metric ton)	Time
U.S. GDP (Unit: billion ＄)	Pearson Correlation	1	.685**	.968**
	Sig.(Double Tail)		.000	.000
	The case number	61	61	61
U.S. Carbon Emissions (Unit:metric ton)	Pearson Correlation	.685**	1	.820**
	Sig.(Double Tail)	.000		.000
	The case number	61	61	61
Time	Pearson Correlation	.968**	.820**	1
	Sig.(Double Tail)	.000	.000	
	The case number	61	61	61

According to the data, among the world's three major powers, the year time and GDP, year time and total carbon emissions, and GDP and total carbon emissions of the United States and China all show a strong correlation trend, and their significance (two-tailed test data) is less than 0.001, indicating a strong correlation. Among them, the total GDP of the United States can explain 68.5% of the total change of carbon emissions, accounting for a relatively large proportion. In China, the

total GDP of China can explain 77.6 percent of the total change in carbon emissions, which also accounts for a large proportion. In Russia, only the total GDP has a strong correlation with time, and the significance is less than 0.001. The total carbon emission has no correlation with time and the total GDP has no correlation with the total carbon emission. Similarly, by observing the data obtained from four representative developed countries, Japan, Britain, Germany and France, it can be found that GDP and total carbon emissions have a strong correlation, the significance is less than 0.001, which is quite significant. The proportion of changes in GDP that can explain the change in total carbon emissions is respectively 86.3%, 75.6%, 92.6% and 49.9%, although there are differences, the proportion is relatively large.

3.2. The Correlation Between the Output Value of Each Industry and Carbon Emissions from Energy Consumption of that Industry in Each Country

Due to the influence of data availability, the global database lacks statistics on the proportion of the three industries in GDP or the output value of the three industries over the years, so the author instead make descriptive statistics on the carbon emissions of the three industries over the years.

The first is the world's three biggest powers. From 1990 to 2020, carbon dioxide emissions from fossil fuel combustion in the US industry fell by 10.3% from 810.33 million metric tons to 727.23 million metric tons. Carbon emissions from natural gas and petroleum systems fell by 4.7%, with metals seeing the largest drop of any industrial sector, at 62.4%. The carbon emissions of all industrial sectors generally showed a fluctuating downward trend, reaching the minimum in 2020. Meanwhile, industrial carbon emissions in the United States fell sharply between 2008 and 2009 over the three decades. The carbon emissions of agriculture showed an overall upward trend, among which the carbon emissions of fuel combustion increased the most, accounting for 19.9%. The carbon emissions of the whole agricultural sector increased by 6.4% in the past 30 years. In addition, for the U.S. tertiary sector, carbon emissions from the transportation sector peaked in 2007 and have fluctuated since, reaching less than 60 million metric tons in 2020. Other commercial, residential and other sectors in the past 30 years, carbon emissions are relatively stable, no obvious fluctuation or rise and fall.

Second is China, which has been the world's largest carbon emitter since 2013. In 2019, China produced 26 percent of the world's carbon emissions, twice as much as the United States, which came in second. Among them, the manufacturing, agriculture and construction in the 1990s to the first decade of the 21st century's carbon emissions has been accounted for the biggest, manufacturing of carbon emissions in 1990 or even seven to eight times of agriculture and industry, and industrial and transportation industry in the 2010s to the rapid growth of the carbon emissions surpassed the agriculture and construction, and manufacturing of still is bigger, This makes industry, transportation industry and manufacturing industry become the three largest carbon emission industries in China at present.

Next comes Russia, where overall industrial carbon emissions have remained virtually unchanged for 30 years, hovering around 5 million metric tons per year, while agricultural carbon emissions have fallen sharply in 30 years, from 237.99 million metric tons in 1990 to 96.02 million metric tons in 2020. Compared with 1990, the carbon emissions of the tertiary industry did not change much. Compared with 1990, the carbon emissions of the tertiary industry increased slightly in 2020, and experienced a trend of first declining and then rising. In 2013, the carbon emissions of the tertiary industry reached a 30-year low of 476.12 million metric tons, and then rapidly rose to the peak of 853.75 million metric tons in 2020.

The second group is representative of developed countries - Japan, UK, France and Germany.

Japan, where carbon emissions from agriculture fell from 28.89 million metric tons in 1990 to 22 million metric tons in 2020, and industrial emissions fell from 73.3 million metric tons in 1990 to 65.3 million metric tons. Carbon emissions from the tertiary sector fell from 600.44 million metric tons in 1990 to 506.69 million metric tons in 2020. At the same time, it should be noted that the peak of the carbon emission of the three industries in Japan occurred between 1993 and 1996, and then began to decline in 1997 and after, and decreased year by year until the lowest point.

Similar to the UK, Germany's carbon emissions from agriculture, industry and the tertiary sector have all declined over the past 30 years, with the peak in 1990. For Germany, the carbon emission of the three industries all declined moderately, with a similar rate of decline, while the UK's industrial carbon emission declined very fast, from 49.39 million metric tons in 1990 to 18.07 million metric tons in 2020, which was the fastest decline among the three industries in the two countries. For France, the carbon emission of agriculture and industry both decreased during the three decades, while the tertiary industry showed a trend of increasing first and then decreasing, with the peak of carbon emission in 1998-1999 and 2003-2004 respectively. Overall, the carbon emission of the tertiary industry in 2020 is less than that of 1990.

The third group of countries are important emerging developing countries, including South Africa, India and Brazil.

These countries are clearly "emerging" and "developing". The carbon emissions of the three industries in each of the three countries have increased significantly over the past 30 years, except for South Africa, where the carbon emissions from agriculture have fluctuated around 30 million metric tons per year. Its industrial carbon emissions rose from 7.44 million metric tons per year in 1990 to 24.21 million metric tons per year in 2020, and its tertiary carbon emissions rose from 98.95 million metric tons per year in 1990 to 140.15 million metric tons per year in 2020. This trend is even more evident in India, where carbon emissions from agriculture rose from 566.53 to 719.82 million metric tons, carbon emissions from industry rose from 26.45 to 168.55 million metric tons, and carbon emissions from tertiary industries rose from 181.81 to 644.65 million metric tons, representing significant increases of five to six times. Although the carbon emissions of Brazil's three industries are not growing as fast as India's, the overall trend is still on the rise, and the carbon emissions of Brazil have almost doubled.

4. Discussion

4.1. United States

Through the analysis of the above results, it can be concluded that the total carbon emission of the United States changes according to the change of time, and it also changes with the total GDP of the United States, that is, it has a strong correlation with the development of the economy. As is known to all, the dense population, industry, large industrial system consumes huge energy side by side, large amounts of greenhouse gases, and that it was not until 2007 that the United States to implement the carbon amount to peak, in 2007-2009, its total emissions and per capita emissions have fallen, one important reason is that during this period the production decline of the us economy. After 2010, the United States launched a large-scale policy of "replacing coal with gas", and the electric power production sector has contributed more than 90% of the carbon emission reduction since the carbon emission peak of the United States, which has led to a large-scale and continuous decline in the carbon emission of the United States. In the 21st century, the shale energy revolution in the United States has realized the reform of the energy consumption structure in the United States. Natural gas power generation has replaced gas power generation on a large scale, and the continuous increase in the proportion of renewable energy has further optimized the energy structure. In short, in the past ten years, thanks to the rapid development and progress of science and technology, the United States has gradually realized energy conservation and emission reduction, with remarkable effect. In the process, the United States made two other climate-related stunts -- George W. Bush's withdrawal from the Kyoto Protocol in March 2001; In June 2017, Trump withdrew the United States from the Paris Agreement [12]. The climate of the United States believes that agreement provides for developing countries and developed countries in global climate governance in different duties and responsibilities, the serious harm the interests of the United States as a developed country, and refused to join the fight against climate change in the future camp in the United States, this undoubtedly for international climate and climate change cooperation among countries increased a lot of difficulty.

4.2. China

In 2020, China first proposed and stressed on many occasions the goal of achieving carbon peak by 2030 and achieving carbon neutrality by 2060. As can be seen in Figure 2, China's carbon emission has been growing rapidly since 2000 and almost doubled in 2006. This is mainly because of the rapid development of national economy, the development of industry is too fast, leading to the growth of industry, the heavy industry in the national economy is relatively large. Besides, China's energy consumption growth is faster, the energy structure is not very reasonable. China is a large coal country, and the energy use and consumption rely heavily on coal. But from the perspective of the efficiency of thermal energy production, in the situation of producing the same heat, the amount of carbon dioxide released by burning coal is far higher than the amount released by burning oil and natural gas. At the same time, China has exported a large number of products with high energy consumption and high emissions in the last decade [13]. At the Copenhagen climate conference, some developed countries pointed out that China has a large amount of foreign exchange reserves and refused to provide China with financial assistance to deal with climate change under the United Nations Framework Convention on Climate Change. In fact, China's massive foreign exchange reserves come from a trade surplus generated by its massive exports of manufactured goods, resulting in massive emissions of pollutants and energy consumption that are borne by the Chinese themselves. At the same time, the large base of our country population, and the need for large-scale infrastructure and housing construction, will lead to a huge increase in carbon emissions.

But in order to tackle the global climate change problem and realize energy saving and emission reduction, China began to put forward corresponding requirements from the "eleventh five-year" stage. After 2005, our country increased energy saving and emission reduction, especially in the industrial field of control, the carbon emission of unit GDP has been declining since 2005. In the past five to six years, China has continuously issued a series of specific policies and industrial regulations, increasingly strict management of the green development of traditional energy industry, and intensified efforts to promote China to achieve carbon peak and carbon neutrality as soon as possible, and vigorously develop the new energy industry [14].

4.3. Russia

For Russia, it could be found that its total carbon emissions showed a gradual decrease trend from 1992, and then a slow increase but not significant. Combining with the historical development stage of Russia, it’s clear that the period of rapid reduction of carbon emission from 1992 to 1998 coincided with Yeltsin's ruling period. Russia experienced serious political turmoil and economic crisis, and the GDP decreased rapidly, and the corresponding energy consumption and carbon emission decreased rapidly [15]. However, in 1998, especially after 2000, that is, after Putin came to power, the Russian economy achieved rapid growth for six consecutive years, so the carbon emission showed a trend of slow rise. After the disintegration of the Soviet union in 1991 officially, Russia greatly reduce carbon dioxide emissions, make its have great advantage in global climate talks, but Russia (including the former Soviet union) industry has been a pillar of economic development, industrialization and mechanization of the top of the world, so the whole Russian historical cumulative emissions data is still in the global top three, As a global energy, industrial and political power, it still plays an important role in global climate change governance and carbon emissions. Of course, Russia has also recognized the importance of carbon emission and climate change in the process of development, and is actively exploring the road of low-carbon transition. In recent years, the Ministry of Economic Development of the Russian Federation has formulated and issued many relevant development strategies and economic bills (such as the National Low-carbon Development Strategy until 2050), and carried out related economic activities such as "Russian Energy Week".

4.4. Japan, UK, France and Germany

According to the report released by the World Institute, by 2017, 19 countries, including Germany, had reached their carbon emissions peak before 1990, 14 countries, including the UK and France, had

reached their carbon emissions peak between 1990 and 2000, and 4 countries, including Japan, were expected to reach their carbon emissions peak before 2020. The fact that Japan, the United Kingdom, France and Germany, which are representative developed countries, reached carbon peak before 2020 is related to the time when they started their industrial revolution [16]. As known, in the 1760s, the first industrial revolution led by Britain began, followed by France, Germany and Japan, which basically completed the first industrial revolution in the late 19th century and early 20th century. The stages of the industrial revolution for the first time in the world, it can be said that all countries is in a state of exploration, science and technology condition at that time is not yet complete, before the leaders can only rely on economic plunder and capital accumulation of material wealth an extensive industrial revolution and economic development, then referred to as "steam era", steam generation, of course, depends on a lot of the burning of fossil energy material. The machine ran day and night, emitting a lot of pollutants, of course, in the process of a large amount of carbon dioxide emissions, so in that period, especially the UK, France and Germany should be the largest carbon emissions. Although Germany and France participated in the second industrial revolution, their innovation and improvement were not too great due to the basis of the first industrial revolution. Carbon emissions only rose in a small range, and then fell back with the end of the second industrial revolution. China and Japan, which were at the tail end of the second Industrial revolution, had large increases in carbon emissions at this time and peaked a little later.

Now, Britain, France and Germany, which have become developed countries, have already carried out national transformation, greatly reducing the intensity and proportion of industrial development, as well as the construction of industrial infrastructure and residential buildings and factories, so that the carbon emission of industrial and tertiary industries have been significantly reduced. The carbon emission of agriculture is due to the need to meet the cost of daily life and diet of Chinese people slightly decreased, little change. On the other hand, Japan has rapidly become a developed country after the completion of the industrial revolution. Its GDP ranks the third in the world all year round, and its carbon emission has not decreased significantly, although it is lower than that of China and the United States. Meanwhile, Japan has often violated climate agreements and polluted the earth's environment in recent years, such as on April 13, 2021. The Japanese government has officially decided to release the nuclear sewage from the Fukushima Daiichi nuclear power plant into the sea, a decision that will severely damage the water environment in the Pacific Ocean and seriously affect the world's ecology.

4.5. South Africa, India and Brazil

The third group of countries is in South Africa, India and Brazil, as a representative of the emerging developing countries, they change has a significant characteristics of carbon emissions, and the characteristics of its development history are similar - three countries served as the colonized countries, slavery and plundered from other countries, so once behind the trend of development, Now they are on the road to growth again. Through the data analysis of the above results, it is not difficult to find that India has the most significant increase in carbon emission. Due to its large population base and large population, and India has always been a major agricultural country in the world, India's agricultural carbon emission reached 566.53 million metric tons per year in 1990, the starting point of our research period. On this basis, it continued to grow to 719.82 tonnes per year over the next 30 years. At the same time, India carried out two periods of industrialization from 1947 to 1991 and from 1991 to now. That is, India is still in the stage of industrial development, so the carbon emission of industry is still increasing significantly. The tertiary industry also began to develop significantly in the last decade or two, so it is still in the stage of rapid growth of carbon emission. At the same time, India's economy and science and technology are still developing, so it does not have enough time and advanced technology to provide more powerful support for the current industrial production, manufacturing development, agricultural reform, and overall economic transformation and development. It will take time for the transformation and realization of high-quality and low-energy economic development.

It is also important to note that India's per capita carbon emissions are far lower than those of many major countries in the world today, and the large amount of carbon emissions due to overpopulation is also an important reason. And as India has been emphasizing, European and American countries have completed their industrial upgrading before, but they have transferred a lot of industrial manufacturing out, especially to developing countries like India with a large number of labor force, their carbon emissions will naturally be less, and the carbon emissions will be transferred to India and other countries. At the same time, a large part of the current climate is rich in developed countries such as Europe and the United States in the process of the industrialization of the last century, billions of tons of greenhouse gas emissions, and is now forcing developing countries to reduce emissions, but at the current energy structure and technology level, began cutting speed will influence the development of developing countries, it is not fair to developing countries. China is also facing the same problem, nowadays many European and American countries unanimously condemned China's carbon emissions, but completely ignored is today's "world factory" in China, almost all over the world provider of consumer goods, also not to mention China's per capita carbon emissions are significantly lower than in developed countries, China is really going on "zero emissions" problem above made great sacrifices.

On September 22, 2020, at the 75th session of the United Nations General Assembly, China formally proposed to the world the goal of carbon peaking and carbon neutrality. The so-called "carbon neutrality" means that within a certain period of time, the emission of carbon dioxide is equal to the amount of carbon dioxide eliminated, that is, to achieve "net zero emissions" and further achieve "climate neutrality". Suriname and Bhutan are the only two countries in the world that have achieved carbon neutrality. China advocates that all countries set their own carbon neutrality targets and actively achieve them. At the same time, China, Russia, Brazil, South Africa and India as a member of the "brics countries" was held in 2022 in the bric countries to address climate change summit issued a joint statement, the current, especially in developing countries around the world are from a new champions league including pneumonia outbreak, the economic crisis, and strive to achieve the sustainable development of the multiple challenges such as difficult recovery, The member states should join hands to address climate change and jointly explore ways to accelerate the transition to low carbon and climate resilience and achieve sustainable, balanced and inclusive recovery and development. "Together, we commemorate the 30th anniversary of the United Nations Framework Convention on Climate Change (UNFCCC) and reaffirm the commitment of all parties to the objectives, principles and institutional framework of the UNFCCC and its Paris Agreement. We reaffirm that multilateralism is an important way to address global challenges such as climate change. We attach great importance to combating climate change and underline the active leadership role played by BRICS countries in the multilateral process on climate change" [17]. All countries have taken corresponding measures -- China has been implementing an active national strategy to address climate change and submitted an updated national self-help contribution and long-term low greenhouse gas emission development strategy; Brazil is committed to addressing the adverse impacts of climate change by joining the Global Methane Agreement and decisively concluding the negotiations on the details of the Paris Agreement. Russia firmly adheres to the principles of the Convention and the Paris Agreement and remains committed to the objectives set out in them, such as improving the utilization of associated gas and building infrastructure to produce hydrogen as a raw material and energy carrier; India is committed to promoting a sustainable lifestyle based on rational consumption and waste reduction, building non-fossil energy power generation, launching a "national hydrogen revolution" and a series of strong climate actions. South Africa has made positive progress towards its climate goals, with the establishment of a presidential Climate Council, the adoption of a national adaptation strategy, the implementation of an enhanced mitigation system with strict regulation and evaluation, the development of a long-term low-emission development strategy, and the introduction of a decade earlier than the peak year for carbon emissions.

5. Conclusion

Through the above analysis and discussion, it's can be concluded that a national and global carbon emissions in different time period due to the influence of various factors will produce different changing trends and characteristics, it has to do with the country (region) during the development of the economy of the intimate relationship, by the world's overall political situation, health and safety at the same time, the influence of the historical development process and its policy, At a particular point in time, an upward or downward change will occur, forming an inflection point. The world's major countries, in general, carbon emissions, carbon emissions per unit of GDP and per capita carbon emissions (carbon intensity) has been or will soon produce downward trend, this is because as to the issue of climate change caused by mainly carbon emissions is more and more serious, has affected the world people's life safety and life, caused the attention of the countries all over the world, Most countries are willing to join global climate organizations and agreements to work with other countries to combat climate change. However, some superpowers such as the United States show their willingness to refuse or oppose.

So the difficulties existing in the current global climate governance have political and economic demands in the short term and the long existence of the problem of global climate and the contradiction between the progressive, climate control multi-point, dispersion and climate problems of conductivity, the contradiction between the system consistency, and the imbalance of climate impact and "north-south" division of responsibility between heterogeneity, response capacity of the spear Shield. In the future, the world must break the barrier of the original ideology and escape the mentality and individuals or national rights, with absolute justness of criticism, to join hands together to face the current climate, headed by carbon emissions enhance the ability of flexible management and organization joint governance, improve the climate problem ability to cope with coordination consistency, integrity management, strengthen the institutional guarantee of domestic and international climate legislation and the construction of a clear reward and punishment system for each responsibility.

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