Review

Climate Change Issues in BRICS Countries

Rahman and Turay

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Climate Change Issues in BRICS Countries

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Abstract

Climate change has emerged as one of the discussions where more is discussed and very less is implemented. People wait for actions to be taken by the government or multilateral organizations but seldom do they capture the developments going on. Several initiatives have been taken by individual countries as well as countries forming groups or conglomerates to tackle the challenges of climate change. This is true for BRICS as well. BRICS countries share the idea of climate protection but are sceptical of the policies passed by developed countries. BRICS as a forum of developing countries challenging the status quo of climate change policies has emerged to formulate its own climate change policies and initiatives in the light of BRICS discussions. The present study is aimed to capture the BRICS climate change policies and initiatives with a descriptive approach.

Keywords: BRICS; Climate change; Carbon emissions.

1. INTRODUCTION

The history of economic thought can be divided into two streams as we see it from the present. Studying past as past and studying past from present are two different approaches. While the former is general, the latter is specific. When this is applied to economic thought that has culminated in the 21st century, two diametrically opposite approaches appear. One is mainstream economics, and the other is nonconformist economics, popularly known as heterodox economics (though not so popular). The neoclassical notion of “scarcity of resource” has been questioned by heterodox economists, and their understanding of resources is different. On the question of ownership of natural resources of a country, the two approaches have different answers. While mainstream economics makes an attempt to deal in a manner of opportunity cost or efficiency problem, heterodox economics deals more with social problems associated with distribution of resources. The two diametrically opposite stands are similar to the climate change policies formulated by developed countries on one hand and developing countries on the other hand. BRICS was highlighted by O’Neil (2001), and on the basis of his report, a formal meeting of BRIC was held in 2009, and South Africa joined in 2010 to complete the group for the acronym BRICS. The objective of BRICS apart from economic association was to challenge the international economic environment dominated by developed countries, at times ignoring the notions of developing and underdeveloped countries. Climate is both dynamic and static. Dynamic in the sense that changes do occur on the basis of anthropogenic causes and static due to fundamental climate attributes that cannot be altered. However, the usage of the term “climate change” has a specific connotation for the 20th and 21st century. It refers to a negative scenario where climate patterns are altering over a long period of time with the causal evidence of carbon emissions. The study is focused on discussing BRICS climate change issues and the trends in carbon emissions.
2. CONCEPTUAL FRAMEWORK

In the study several key words are used—namely, climate change, policies, initiatives, and BRICS. We take up each key term one by one in order to expound its meaning and definition. Climate change according to Cambridge dictionary is “changes in the world’s weather, in particular the fact that it is believed to be getting warmer as a result of human activity increasing the level of carbon dioxide in the atmosphere” [Def. 1]. In the present era of globalization, multilateral talks on climate change, “carbon emissions” has become the near synonym of climate change. Though this may not define all forms of causes of climate change, it is the most important one in affecting the climate change. Thus, in our study the term “climate change” specifically focuses on carbon emissions as an anthropogenic activity. Other multilateral organizations define climate change more specifically and differently. For example the Intergovernmental Panel on Climate Change defines it as follows: “Climate change refers to a change in the state of the climate that can be identified (for example, by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use.” The Framework Convention on Climate Change (UNFCCC), in its Article 1, defines climate change in a more subtle manner as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods.” The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition and climate variability attributable to natural causes. In the present literature of climate change, seven theories are prominently coded for our further discussion in the study.

2.1. Theory 1 (CCT1): Anthropogenic Global Warming
This theory states that human causes are the primary ones in altering climate over decades through carbon emissions. These carbon emissions are due to humanity’s efforts under industrialization or lifestyle choices as well as due to deforestation to expand urbanisation.

2.2. Theory 2 (CCT2): Bio-Thermostat
This theory states that rising temperatures and levels of carbon dioxide (CO₂) in the atmosphere create a spillover of biological and chemical effects, which then have a cooling effect, like a natural thermostat.

2.3. Theory 3 (CCT3): Cloud Formation and Albedo
This theory states that changes in the formation of albedo and clouds create negative feedback that cancel out all or nearly all the warming effects of higher levels of CO₂ causing serious climate change.

2.4. Theory 4 (CCT4): Human Forcings
This theory states that mankind’s greatest influence on climate is not its greenhouse gas emissions, but its transformation of Earth’s surface by clearing forests, irrigating deserts, and building cities.

2.5. Theory 5 (CCT5): Ocean Currents
This theory states that global temperature variations over the past century and a half and particularly in the past 30 years were due to the slowdown of the ocean’s thermohaline circulation (THC).

2.6. Theory 6 (CCT6): Planetary Motion
This theory states that natural gravitational and magnetic oscillations of the solar system induced by the planet’s movement through space drive climate change.

2.7. Theory 7 (CCT7): Solar Variability
This theory states that changes in the coronal ejections and magnetic fields of the sun cause changes in cloud formation, ocean currents, and wind cause the climate to change.
According to Oxford dictionary, policy means “a course or principle of action adopted or proposed by an organization or individual” [Def. 1]. For fulfilling the objective of this study, we will look toward climate change issues by BRICS countries in this respect. Initiatives pertaining to climate change will also be considered from the point of view of BRICS countries. The difference between initiatives and policy is formal and informal. In the light of such a distinction, it would be fitting to study BRICS climate change issues.

3. REVIEW OF LITERATURE

Climate change has remained an area of natural scientists since time immemorial, but recently social scientists have jumped in to discuss carbon emission in government policy and in initiatives taken by myriad platforms. We are going to cite a few of those relevant studies from the point of view of social sciences and not natural sciences. We will move from a general to specific review of studies in this section. Recent study on the climate policy design in terms of emissions and solar radiation has suggested evaluating in terms of social cost and environmental changes. The impact of asymmetry on mitigation and solar radiation management has been found significant, and asymmetries play an important role in influencing incentives for cooperation and unilateral actions (Manoussi and Xepapadeas, 2017). Climate change in a political system of governance depends on national level public bureaucracies in order to formulate and implement effective and efficient measures. The aggregation of numerous climate change policies plays a decisive role in the implementation of climate policy. Studying these paradigms in the light of power theories has shown that climate initiatives and policies by national bureaucracies give them power. The study was conducted in Bangladesh (Rahman and Giessen, 2017). On the issue of disproportionate policy reactions in the case of climate change policies, it was identified that governments react to climate change by formulating policies in order to manage blames. The government may involve itself in a blame game between policy makers and policy implementers (Howlett and Kemmerling, 2017). The world has collectively brought the discourse of global warming and recent study foci on the ratification plan. In Singapore, substantial measures have been taken for reducing global warming, and in the case study, the online policy documents by 11 organizations were used to identify policy levers as theoretical constructs of climate change policies (Ng, Lwin, and Pang, 2017). Research on BRICS with respect to climate change mitigation in the Forestry Sector has revealed new results. BRICS has demonstrated specific endeavors in this sector indicating its leading role in climate mitigation. Extended cooperation and knowledge sharing may bring additional gains in reducing carbon emissions from forests and developing tools for Safeguards Information Systems (SIS) (Bhan et al., 2017). It has been identified that BRICS climate change policies are contextual and constitute the basis for future climate change negotiations. The geopolitical positioning of BRICS in the global economic order is also a key factor when it comes to climate change initiatives. The empirical study of media coverage of the IPCC reports shows a promising position of BRICS in climate change (Yagodin et al., 2017). One of the studies examined time series behavior of CO₂ emissions in BRICS in a long approach with structural breaks and nonlinear trends. The results show that the CO₂ emissions are integrated of order one for BRICS countries indicating that there are permanent effects of shock for CO₂ emissions (Gil-Alana, Cunado, and Gupta, 2017). A study conducted on CO₂ emissions for BRICS for the sample period 1980-2011 suggested differences within BRICS countries. Due to the heterogeneity of emissions in BRICS, it is divided into groups, one consisting of Brazil and Russia and another consisting of China, India, and South Africa. It was concluded that environmental consequences of growing emissions should be studied on a case-by-case basis (Azevedo, Sartori, and Campos, 2018).

4. BRICS CLIMATE CHANGE POLICIES

Climate change policies for BRICS can be divided into two parts on the basis of chronology. Those that were followed by BRICS countries individually before the inception of BRICS and those that are the outcome of BRICS summits with respect to climate change. The theory of BRICS climate change policies demands to ignore the former and to consider latter as a collaborative effort. Much of the talk on climate change by BRICS has been on theoretical grounds ignoring the official statements and ratifications. The point is to include only those issues in BRICS climate change policies that are reflected in the BRICS summits official documents or oral releases. The reason being individual countries in BRICS take separate climate actions, but when they
come together, it is only then that they form policies that can be said to be of BRICS countries. We take the approach of discussing climate change policies as discussed and expounded in different summits.

4.1. Before First Summit
Before the first summit of BRICS, there were few informal meetings between the countries on several issues, but no declarative statements were issued. Therefore, no official stand of the countries was clear or specific. In July 9, 2008, a meeting of BRICS representatives was held at Hokkaido, Japan, without any formal agreement.

4.2. First BRICS Summit
The first BRICS summit was held on July 16, 2009, at Yekaterinburg, Russia. A very popular joint statement was issued pertaining to Global Food Safety, an issue of concern to the world but particularly important to developing countries. In the first summit, an indication was given by BRICS countries that they are ready for constructive dialogue on climate change. BRICS countries identified principle of common but differentiated responsibility. The phrase “common but differentiated responsibility” gave a balanced approach to the climate change policies of BRICS, which would not conform to developed countries’ dictates on climate policies but would reflect the issues of developing and underdeveloped countries. BRICS were also clear to take measures that were in symmetry with the socioeconomic development tasks of BRICS countries. Apart from this statement, no other specific information was released.

4.3. Second BRICS Summit
The second BRICS summit was held on April 15 at Brasilia, Brazil. The global players of G7 and G10 were already having an eye on BRICS due to its mention of climate change in the first summit. Climate change was discussed in the Declaration Statement of the Second Summit in points 17 and 22 of the statement. While point 17 dealt with agriculture, point 22 emphatically dealt with climate change. BRICS countries decided to curtail the food security issues due to climate change. Point 17 specifically talked about the climate change initiatives jointly to be taken by BRICS countries. BRICS countries identified climate change to be a serious threat and acknowledged the need for global action. BRICS countries committed themselves to promote the Sixteenth Conference of the Parties to the United Nations Framework Convention on Climate Change and the Sixth Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol, in Mexico. The phrase “common but differentiated responsibility” was reiterated. BRICS countries indicated their displeasure toward the Mexico meeting by demanding it to be more inclusive, transparent, and fair.

4.4. Third BRICS Summit
The third BRICS summit was held on April 14, 2011, at Sanya, Hainan, China. In this summit declaration, the wordings on climate change became more specific and clearly directed at reforming the existing system dominated by developed countries. Development and use of renewable sources of energy was appreciated, and BRICS initiatives on information exchange regarding renewable energy sources were presented to the global audience. Climate change as a global threat was repeated in the statement and South Africa’s hosting of UNFCCC COP17/CMP7 was appreciated. A support for Cancun Agreement was extended toward the international community. It was specified that BRICS would intensify cooperation on the Durban conference.

4.5. Fourth BRICS Summit
The Fourth BRICS summit was held on March 29, 2012, at New Delhi. A Delhi action plan was made adjacent to the BRICS declaration. From referring to the last three summit declarations, it is now clear that the discussion on climate change in BRICS is getting bolstered, and BRICS are starting to say more about climate change. BRICS identified the increasing relevance of climate change discussion just before the UN Conference on Sustainable Development (Rio+20) and the Conference of Parties to the Convention on Biological Diversity being hosted in Brazil and India. The mention of the Eighth WTO Ministerial Conference was also found in the declarative statement. The phrase “common but differentiated responsibility” was reiterated. A promise for the use of clean and renewable energy sources was made with the clear contention that fossil fuels dominate the energy mix. BRICS demanded extended international cooperation in the development of safe nuclear energy.
4.6. Fifth BRICS Summit
The fifth BRICS summit was held on March 27, 2013, at Durban, South Africa. Again in line with what was said in the previous summit, BRICS acknowledged climate change as one of the greatest threat and challenge toward achieving sustainable development. BRICS called for reaching a successful conclusion by 2015 on COP17/CMP8.

4.7. Sixth BRICS Summit
The Sixth BRICS summit was held on July 15, 2014, at Fortaleza, Brazil. This summit was important due to the discussions that included post-2015 Development Agenda. Point 52 of the Declaration Statement focused on climate change policies taken up by BRICS countries. BRICS reiterated its stand to comply with the UNFCC adoptions and also invited the rest of the world for the same. The support for Kyoto Protocol was highlighted and its importance discussed.

4.8. Seventh BRICS Summit
The seventh BRICS summit was held at Ufa, Russia, on July 9, 2015. Point 53 of the Ufa declaration focused on the promotion of agricultural technologies so that provision for food is available to vulnerable communities. Support for 2015 as the International Year of Soils was extended to UN General Assembly. Protection of soil resources as the need of the hour was integrated with climate change policies. BRICS clarified that climate change policies can only be effective when formulated in a global context under UNFCCC. Transfer of knowledge and technologies are also important to address climate change.

4.9. Eighth BRICS Summit
The Eighth BRICS summit was held at Goa, India, on October 16, 2016. In this summit one of the key features was that importance of nuclear energy was highlighted by the BRICS. It was clearly stated in the Official Declaration that some BRICS countries will require the usage of nuclear energy in order to meet 2015 Paris Climate Change agreement. BRICS extended their support for natural gas usage as a clean fuel to promote sustainable development and to reduce greenhouse emissions.

4.10. Ninth BRICS Summit
The ninth BRICS summit was held on September 4, 2017, at Xiamen, China. Further promotion of green development and low-carbon economy was bolstered in the BRICS talk. The call to invite all countries to adopt UNFCCC principles was reiterated. BRICS urged developed countries to provide financial, technological, and capacity-building support to developing countries to enhance their capability in the adoption of climate change policies.

5. BRICS ENERGY CONSUMPTION AND CARBON EMISSIONS
BRICS policies on climate change and claims made in the official declaration need to be identified in the backdrop of energy consumption and carbon emissions data. It is indeed strange that few of the statements in the declarations appear to be contradictory in the light of the data set. We move to identify five core indicators of climate change in order to draw an inference for BRICS performance and adherence to climate change policies. Table 1 shows the list of indicators along with the targeted inference.

On the basis of Table 1, we would be building the discussion for BRICS countries. The first indicator is primary energy consumption expressed in million tonnes of oil equivalent (Figure 1). Trend study of PECO is important, as it has been reiterated by BRICS countries to achieve sustainable development and climate change benefits by reducing the overall fuel consumption. Second indicator is the fuel classification of primary energy consumption, which highlights the comparison of usage between fossils and clean energy sources. The third indicator, natural gas production, is selected as it has been said by BRICS countries to promote natural gas and its usage. Whether these are just words or deeds, has to be evaluated. The fourth and fifth indicator is CO2 emissions in a different perspective and is selected to identify whether carbon emissions have reduced in BRICS countries or not. All the data of BRICS is compared with OECD, non-OECD, and EU countries, wherever available.

From Figure 2, we can compare the consumption of BRICS and other entities for 11 years' sample data (2007-2017). The mean value of the consumption of Brazil is 274.12 mtoe (million tonnes oil equivalent), and there is an overall increasing trend. Last three years growth rates are −0.89% (2015), −2.04% (2016), and
It shows that Brazil has in the last three years reduced the overall consumption of energy except for 2017. The mean value for the consumption of Russia is 680.64 mtoe, and the mean value for India is 600 mtoe. For India, the overall trend is increasing, while for Russia there is a mixed trend. For both countries, the growth rate for 2016 and 2017 is positive. China has an overall trend of increasing consumption with a mean value of 2705 mtoe that is highest among all BRICS countries. It is even more than the rest of the BRICS countries. The growth rate in 2016 was 1.3%, and in 2017, it was 2.7%.

Table 2 highlights the primary consumption by fuel type and shows fossils and clean energy sources. An analysis of the table shows that since 2016, usage of clean energy sources has increased in BRICS countries.
countries and the same trend has continued for OECD countries, non-OECD countries, and European Union member countries.

The inference drawn from Table 2 is that BRICS countries are performing well in terms of using clean energy sources such as renewables, nuclear, and so on, but they need to catch up with the growth rate of OECD and EU member countries. As has been reiterated, natural gas has been in the limelight due to the BRICS declaration.

As per Figure 2, Brazil has shown a mean value of 19.46 bcm (billion cubic meters), and the mean value of Russia is 598.3 bcm. For India and China, the mean values are 33.76 and 124.2 bcm, respectively. The data for South Africa is not available, but as per general information, it is negligible. Thus, out of BRICS except South Africa, all countries are using natural gas and are producing it. From Figure 2, it is clear that there is an increasing trend in the natural gas production of BRICS nations with a slight variation. This is a good indication in favor of climate change policies.

As the other two indicators of climate change policies are based on carbon emissions with different expressions. The first is measured and expressed as per capita and the other as a ratio of GDP. CO₂ emissions (from now on carbon emissions) as per capita indicates per person carbon emission. Carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring. Figure 3 shows carbon emissions per capita. Carbon emissions for all the countries and groups are increasing from 1990 to 2014 according to World Bank statistics.
The mean value of carbon emission for Brazil is 1.86 mtpc (metric tons per capita), and for Russia it is 1.14 mtpc. For India the mean value is 1.08, and for China it is 4.1 mtpc. South Africa has a mean value of 8.1 mtpc. In totality, the mean value for BRICS countries in terms of per capita carbon emissions is 20.61 mtpc. If we compare it with the mean value of OECD (10.57 mtpc), the mean value of BRICS is more than OECD, indicating that carbon emissions are more in BRICS. The mean value for EU members is 7.87 mtpc, which is also less than BRICS countries. This has remained a challenge for the BRICS countries, and there is great need for BRICS nations to introspect.
Carbon emissions when expressed as PPP of GDP can show the emissions from the economic perspective. Countries all over the world and signatories of Paris agreement have started taking measures to reduce carbon emissions. They understand that reducing in terms of GDP ratio is a better indicator than per capita carbon emission. From Figure 4, the mean value for Brazil is 0.18 ppgd (kg per PPP $ of GDP), and for Russia it is 1.22 ppgd. For India the mean value is 0.45 ppgd, and for China it is 1.08 ppgd. The value for South Africa stands at 1.03 ppgd. On the other hand, the mean value for OECD is 0.41 ppgd, and for EU members it is 0.35 ppgd. The mean value for BRICS is 3.04 ppgd. When BRICS is compared with OECD and EU, both OECD and EU have lesser carbon emission as a ratio of GDP. This indicates the BRICS policies may be in the right direction, but still there is a need for better results.

Trends in Figure 4 show that all countries and groups gives a promising figure for reducing carbon emissions.

6. CONCLUSION

The study has made an attempt to capture the descriptive issues regarding BRICS climate change. The study argues that BRICS has formulated policies for reducing carbon emissions and has adopted several key agreements on climate change. Among BRICS, China is leading the trend in carbon emissions, but it has also reduced emissions when expressed in terms of GDP ratio. BRICS has failed to outperform OECD, non-OECD, and EU member countries in terms of climate change and sustainable development climate goals though BRICS summits have focused on and reiterated the same objective. The nine BRICS summits have bolstered the commitment of BRICS countries toward climate change policies.

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