

Research Article

## **Green Finance: Global outlook and comparative analysis among BRICS Nations**

**Dr. Viral M. Pandya**

Associate Professor of Management, Gujarat National Law University, Gandhinagar  
B/6, Sonali Apartments, Umiya Vijaya, Satellite Road, Ahmedabad – 380015, Gujarat India.  
**Email address:** viralmpandya4@gmail.com

### **Abstract**

The world is moving towards achieving the goal of sustainable development at its best. Two big summits took place in the last decade with a prime focus on ensuring sustainable development. Green finance is one of the tools which can contribute to the said goal in a big way. The present article is an attempt to provide an understanding of green finance and its global outlook. It also highlights on the importance of BRICS nations' economies, while providing a comparative analysis of green finance on environmental issues, initiatives amongst among BRICS nations for green finance. The last section provides concluding observations for policymakers and managers towards attaining the goals of sustainable development.

**Keywords:** sustainable development, green finance, BRICS nations, Brazil, Russia, India, China, South Africa, green management, climate finance

### **Introduction**

In the last half of the twentieth century, four key themes emerged from the collective concerns and aspirations of the world's peoples: peace, freedom, development, and environment. Over a period of almost 100 years, more or less the first three concerns have been taken care of but it is only in the last 40 years that the environment (local to global) became a key focus of national and international institutions, policymaking bodies and governments. During the last decade two major events, namely Rio+20 and Paris Agreement, took place to ensure systematic and strategic environmental protection at the global level.

The Rio+20 outcome document, *The Future We Want*, called for a wide range of actions for environmental protection for mother earth (UNEP yearbook). This call for a wide range of actions has been the outcome of the growth in increasing demand due to the rise in population and resultant high growth of industrial activities. Unthoughtful and excessive industrial activities, amongst others, have created a huge threat to mankind, ecology, and the environment at large. In pursuant to business-led industrial activities, companies consume natural resources in a way that prevent ecosystems from re-generating our air, water, and food supplies and this has periled earth's ability to sustain life (Lovins, Lovins & Hawken, 2007). These activities primarily range from excess use of resources, waste generation and harmful systems, processes and products/byproducts which ultimately affect the environment in the long run. The range of actions calls for sustainable industrial processes and activities by reducing excessive use of resources, appropriate waste management systems, environmentally

friendly processes and products/byproducts which directly reduces environmental degradation.

Since the last two decades, there has been growing pressure on businesses to pay more attention to environmental and resource conservation. One initiative towards the movement is to focus on triple bottom line reporting (3BL) concerning the relationship of profit, people, and the planet. This has posed challenges for corporates to integrate environmental, health, and safety concerns by incorporating green management in their business activities.

Green management broadly includes aspects of climate change, ecosystem management, waste management, resource efficiency and environmental governance. UNEP inspires the world with its mission statement, '*To provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations*'. The mission statement reflects the commitment for promoting an integrated approach to protect the earth. Needless to say, such commitment is required at all level of human activities including business operations.

### **Definition and scope**

Höhne, Khosla, Fekete & Gilbert (2012) has defined green finance as a broad term that can be referred to as financial investments flowing into sustainable development projects and initiatives, environmental products, and policies that encourage the development of a more sustainable economy.

Green finance includes climate finance but is not limited to it. It also refers to a wider range of other environmental objectives, for example, industrial pollution control, water sanitation, biodiversity protection, etc. Within green finance, mitigation finance and adaptation finance are specifically related to climate change-related activities. Mitigation financial flows refer to investments in projects and programs that contribute to reducing or avoiding greenhouse gas emissions (GHGs). Whereas adaptation financial flows refer to investments that contribute to reducing the vulnerability of goods and persons to the effects of climate change.

Similarly, the G20 defines Green Finance as the 'financing of investments that provide environmental benefits in the broader context of environmentally sustainable development'. Whereas the OECD considers the term to be 'stand-alone, a sub-set of a broader investment theme or closely related to other investment approaches such as SRI (socially responsible investing), ESG (environmental, social and governance investing), sustainable, long-term investing or similar concepts.'

Further, as explained by Lindenberg (2014), Green finance comprises of three categories (i) financing of green investments (ii) financing of public green policies and (iii) green financial system. *The financing of green investment* includes areas in the domain of environmental goods and services like water management, protection of biodiversity and landscapes, etc.; prevention, minimization, and compensation of damages to the environment and to the climate, etc. It broadly includes investments in waste processing and recycling, biodiversity protection, water sanitation, industrial pollution control, energy efficiency, renewable energies, climate change adaptation and other climate change mitigation activities like reforestation, etc. On the other hand, *The financing of public green policies* deals with the implementation of policies that mitigate environmental damages and promotes environmental projects. And *green financial system* includes green investments like the Green Climate Fund or green investment instruments like green bonds, structured green funds, etc.

The bottom-up methodology (IFC, 2017) of analyzing green finance defines what is 'green' at the project level which is based on the proposed use of the investment in the real economy through estimates for the respective green share per project. Then, at the industry and country level, the numbers are aggregated. These numbers, in the resultant form, are then compared to green finance needs to identify

gaps and action points.

There are different actors which play an important role in defining green finance according to their underlying motivations. These actors include - financial institutions, banking associations, international initiatives/ reporting frameworks, standard setters (for accounting and reporting), regulatory bodies, international organizations, and human resources. Hee-Jin Noh (2010) has suggested three-stage initiatives by integrating these actors to promote green finance.

[Table 1: Strategic initiatives to promote green finance]

Recommended Policy Measures	Description
<b>Set up Statutory Infrastructure growth</b>	
Environmental requirements reflected in statutes for investment, lending, credit rating, accounting, etc.	<p><i>Require financial institutions to address environmental concerns: fiduciary and lender's liability on the environment.</i></p> <ul style="list-style-type: none"> <li>- <i>Reflect environmental factors in credit rating and accounting procedures.</i></li> </ul>
Corporate disclosure of environmental information	<p><i>Put environmental information as a requirement for listing and disclosure.</i></p> <p><i>Shift from voluntary to mandatory disclosure gradually</i></p> <ul style="list-style-type: none"> <li>- <i>Finance institutions in industrialized countries already are required to disclose comprehensive environmental information pursuant to voluntary guidelines, such as the Global Reporting Initiative.</i></li> </ul>
Certification of green Technology, enterprise and industry to guide investment and lending	<p><i>Introduce green business certification programs, which are specific to the industry, technology, business type, and size.</i></p> <ul style="list-style-type: none"> <li>- <i>Leading financial institutions, such as Goldman Sachs, rate environmental performance; for example, categorizing green and non-green businesses.</i></li> </ul>
<b>Develop Technical Infrastructure</b>	
Green indices	<p><i>Develop a green enterprise index to promote green investment.</i></p> <p><i>Develop a green (carbon) risk index to promote investment in green bonds.</i></p> <ul style="list-style-type: none"> <li>- <i>JPMorgan and Innovest co-developed the JPMorgan Environmental Index-Carbon Beta (JENI- Carbon Beta Index), the world's first bond index that reflects climate change risk of businesses.</i></li> </ul>
System for green information provision	<p><i>Build a mechanism to access essential green information.</i></p> <ul style="list-style-type: none"> <li>- <i>Information for financial institution's credit and investment decisions: license and approvals from the environment ministry and other authorities, regulatory compliance, green enterprise designation, participation in voluntary agreements, etc.</i></li> </ul>

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Green enterprise rating agency	<p><i>Promote green company rating agencies.</i></p> <ul style="list-style-type: none"> <li>- <i>Three major rating agencies that specialize in corporate environmental performance are Innovest (US), EIRIS (UK) and SAM (Switzerland).</i></li> </ul>
<b>Educate Human Resources</b>	
Green financial professionals	<p><i>Train professionals for research, review, and investment to provide green financial services.</i></p> <ul style="list-style-type: none"> <li>- <i>Introduce professional training programmes and promote expertise.</i></li> </ul>
Green financial consumer education	<ul style="list-style-type: none"> <li>- <i>Initiate public and consumer education to promote awareness of:</i></li> <li>- <i>The need for green growth</i></li> <li>- <i>Green bubbles, environmental risks and other issues.</i></li> </ul>

*[Adapted in part from 'Financial Strategy to Accelerate Innovation for Green Growth']*

### Global outlook

Looking at the outlook for the year 2017, it is observed that after a year of the signing of the Paris Agreement in 2015, globally there has been an increase in interest in building a wide spectrum of financial solutions which can cater to the need of turning around the issue of climate change.

According to the estimate made by Green & Resilience Banks (November 2016), to meet the pledges made by countries supporting the Paris Agreement, investment of the quantum of \$13 trillion is required. And the amount of investment needed for a low-carbon, climate-resilient economic transformation is estimated as to \$6 trillion per year, or \$90 trillion by 2030.

As per the report, the investment in the year 2012 has been \$359 billion which has subsequently increased to \$432 billion in 2015. However, it has reduced by 11 percent to \$383 billion in the year 2016. It is important to note that the record in 2015 was driven by a surge in renewable investments, particularly in China, the U.S., and Japan which subsequently reduced in 2016 due to the combined effects of falling technology costs and lower deployment in some countries. It is also worth noting that the investment made by the private sector has been consistently more than ever (of average \$375 billion) and the overall share of public investment in the same has remained steady (of average \$ 125 billion). In the private sector, the actors like project developers, commercial finance institutions and direct institutional investors have been in the leading role of driving the higher investment. On the other end of the public side, development finance institutions accounted for the majority of public flows. Also, in the year 2015–2016, 79% of finance was raised in the same country in which it was spent. The overview of region-wise green investment figures are given below.

Further, as per the report, the sector-specific global outlook of climate finance indicates that a total of \$270 billion of investment has been incurred by private players in the renewable energy sector only. Out of a total \$140 billion, 23.5% in the renewable energy sector, 27% in energy efficiency and 15.2% has been invested in the transportation sector. Similarly, 15.2% in adaption, 14.5 % in other avenues and almost 2% have been invested in land use.

**[Table: 2 Destination region of climate finance, 2017/2018 Annual average]**

Region	Investment (USD billion)	Percentage Share	Rank
East Asia and Pacific	238	41%	1

Western Europe	106	18%	2
Americas	93	16%	3
Japan, Korea, and Israel	31	5%	4
Latin America and the Caribbean	28	5%	5
South Asia	19	3%	6
Sub Saharan Africa	15	3%	7
Transregional	13	2%	8
Central Asia and Eastern Europe	13	2%	9
Middle East and North Africa	13	2%	10
Other Oceania	11	2%	11

Source: <https://climatepolicyinitiative.org>

Table 2 indicates the destination region of climate finance (annual average) for the year 2017/2018. As per the data, the East Asia and Pacific contribute the highest share of 41 percent. Whereas Western Europe and the Americas contribute around 18 percent and 16 percent respectively. The remaining regions contribute 5 percent or less of the total climate finance investment.

Looking at the overall trend after Paris Agreement 2015 [Article 2.1c: make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development], it is worth noting that the majority of nations are working to implement climate plans. A number of initiatives indicate that there have been efforts through capital markets, financial systems, and large corporations to align with low-carbon and climate-resilient development. It is important to note that new investment vehicles like water, land use, insurance, and adaption are on the rise with a focus on opportunities in energy efficiency.

In March 2018, the new Global Green Finance Index (GGFI) was launched by Z/Yen and Finance Watch to observe the quality and depth of different countries green finance offerings. According to the index:

- The leading green financial centers in each region are London, San Francisco, Shanghai and Shenzhen, Johannesburg and Cape Town, Mexico City, and Moscow.
- Paris, Frankfurt and New York have been cited as the centers as likely to become more significant over the next two to three years.
- Among different investment avenues, renewable energy investment, green bonds and sustainable infrastructure finance have been rated as the areas of high impact on sustainability and of high interest. However, SRI investments and green loans have been rated at the areas with least impact on sustainability.

### **BRICS and sustainable development**

Kofi Annan, the then Secretary General of the United Nations, described implementing the concept of sustainable development as the greatest challenge of the 21st century. In tackling it, it is unthinkable to ignore the future additional economic and political powers like BRICS.

Brazil, Russia, India, China and South Africa constitute over 40% of the global population and their combined economic weight. This figure is almost equal to one-third of the global Gross Domestic Product in PPP terms, which is roughly equal to the G-7 countries. This makes the BRICS as one of the emerging center of gravity in the international economic system. The BRICS are expected to continue to account for more than half of global economic growth through 2030. In the coming decade the

cooperation to achieve common goals, both among the BRICS and between the BRICS is likely to be one of the game-changing features in international development. Needless to say that with their impressive economic growth, BRICS countries have the potential to become key game changers in ensuring sustainable development. This goes even more as each country of the group plays the lead function in their respective regions. Even though progress in sustainable development often falls short of the mark, many countries all over the world are implementing innovative approaches to it and BRICS are also no exception to it.

After the Paris agreement, consistently an increasing number of countries are expanding their strategies for sustainable development. Efforts have been observed to integrate these strategies at the base of economic growth on a long-term foundation, balancing the interests of the economy, society, and the environment. In such a case, understanding existing status, initiatives undertaken and available gaps in BRICS nations become very crucial for policymakers as well as business houses for expanding scope of business in a sustainable manner.

The following section provides insight into BRICS nations' current status, initiatives undertaken and observations towards sustainable development actions.

### **Comparative analysis of green finance among BRICS Nations**

#### ***Brazil***

##### ***Current status***

Brazil is widely known as 'the lungs of the world' for its dense forests. In one of the studies undertaken by EMBRAPA, the damage that will be caused by climate change to agriculture in Brazil will reach to R\$ 7 billion by 2020. Also, Brazil's National Institute for Space Research has found that Amazon deforestation has increased by almost 29 percent in the year 2015-2016. Further, energy-related emissions in Brazil have increased to 130 percent over the period of time from 1990-2012, against a Nationally Determined Contribution (NDC) of a 10 percent reduction by 2030. Between 2001 and 2016, Brazil lost 46.4 Mha of tree cover. The said lost in tree cover is equal to 8.9 % of the area's tree cover extent in 2000, and equivalent to 3.84Gt of CO<sub>2</sub> emissions.

##### ***Initiatives and observations***

In March 2017, to promote sustainable development through green finance, the Central Bank of Brazil has issued guidelines on integrated risk management including environmental risk to promote sustainable development. Similarly, the Brazilian Federation of Banks (FEBRABAN) and the Brazilian Business Council for Sustainable Development (CEBDS) has launched the voluntary 'Guidelines for Issuing Green Bonds in Brazil 2016'. As a part of commitment towards mutual sustainable economic growth, the UK-Brazil Green Finance Partnership has also been launched and under that, a bond-focused green infrastructure road show was organized to the UK in December 2016.

CEO of UBS, Sylvia Coutinho suggested that Brazil will require huge foreign capital to finance its green projects. Also as Brazil has the largest environmental assets in the world, there is a need to create links among investors to bring this capital to Brazil. It is also observed that there is a need to create awareness about access to funds among many institutions and governments' agencies. However, little knowledge within financial institutions about energy efficiency projects and limited financial capacity of energy service companies (ESCOs) have hindered the expansion of energy efficiency projects at large scale. There is a need for the Brazil government to reform its fiscal policy, as well as other regulatory instruments to send clear signs to engage the private sector in climate-relevant infrastructure investments.

## *Russia*

### *Current status*

Russia lost 49.5Mha of tree cover between 2001 and 2016. The said loss is equal to 6.5 % of the area's tree cover extent in 2000, and equivalent to 2.38Gt of CO<sub>2</sub> emissions. Further, Russia is warming almost 2.5 times faster than the rest of the globe (as per Russia's Ministry of Natural Resources and Environment). 68% of Russia's energy is produced by polluting fossil fuels, and it is a large producer of those fuels (2010). The report from Russia's Ministry of Natural Resources (April 2017) stated that 74 percent of Russians live in environmental deterioration and that 40 percent of them consumed water unhealthy to drink.

### *Initiatives and observations*

To promote sustainable finance in Russia, the Law on Protection of Environment is one of the key sources of regulation which facilitates green finance by setting out the definition of 'best available technology'. The Law on Energy Saving and Energy Efficiency Improvement provides the platform where the state can support the energy efficiency investments by reimbursement of a portion of expenses on servicing the loans that were received from Russian lending institutions to make investments in the energy-saving and energy efficiency areas. In 2016, Russia presented its intended nationally determined contribution (INDC). The Central Bank of Russia conducted a 'Review of financial market regulation: green bonds'. In May 2017, an international conference on 'Green Financing for Sustainable Development' was held in Russia to promote and expand the scope of sustainable development. It was suggested to grant subsidies to reimburse part of the R&D-related expenses allied to the manufacturing of goods as part of the priority investment projects. These can include those innovations which facilitate the introduction of new economically efficient and environmentally friendly production processes. Kobzev, M. and Hussain, T (2017) have recommended the introduction of preferential green project finance programs on a priority basis. They have also emphasized

on the need for more pro-active green bonds use. They have recommended establishment of regulatory framework such as information disclosure, development of standards of independent audit and green credit rating assignment, creation of a green bonds index and other mechanisms to enable green financing structures in a more systematic manner.

## *India*

### *Current status*

Between 2001 and 2016, India lost 1.35Mha of tree cover. This loss is equal to 3.5 % of the area's tree cover extent in 2000 and equivalent to 151Mt of CO<sub>2</sub> emissions. World Bank report (2014) has estimated that the ecosystem degradation in India currently costs the country \$80 billion annually, or 5.7 percent of GDP. As per the 2009 report, India was the third-largest emitter of carbon dioxide (1.65 Gt per year). In India, major issues causing environmental degradation are air pollution, poor waste management, water pollution, preservation and quality of forests, biodiversity loss, and soil degradation.

### *Initiatives and observations*

To promote green finance, India requires strategic efforts at three levels (i) making required financing available (ii) ensuring innovation in its deployment (in areas where financial institutions can play a significant role) (iii) collaborative efforts for disruptive innovations in green growth. Mr. Rana Kapoor (founder & CEO of Yes Bank) has projected that India needs an estimated \$2.5 trillion by 2030 to meet its climate goals. In 2016, India organized a bond- focused green infrastructure roadshow to the UK. The Reserve Bank of India is in the process of formulating a roadmap for green banking by looking into various aspects of green finance. Similarly, the SEBI (Securities and Exchange Board of India) has issued disclosure requirements for issuing and listing of green debt securities. NTPC, one of India's largest conglomerates, has also been listed at the world's first Indian green masala bond and first masala bond by a quasi-sovereign issuer on the London Stock Exchange.

### *China*

#### *Current status*

Between 2001 and 2016, China lost 8.21Mha of tree cover. This loss is equal to 5.0 % of the area's tree cover extent in 2000 and equivalent to 886 Mt of CO<sub>2</sub> emissions. As of 2017, coal remained the largest source of energy in China at just over 60 percent of its energy mix, though that has dropped from 80 percent in 2010. More than 50 percent of China's surface water is not fit for human consumption. And about 2.6 million sq. km (one-quarter of the country's total land surface) is under desertification.

#### *Initiatives and observations*

To curb environmental degradation, since 2014, 15,000 factories have been required to publicly report their air emissions and water release data in real-time. In August 2016, the State Council approved the 'Guidelines for Establishing the Green Financial System' to incentivize and promote green loans, green bonds, green funds, green insurance and green finance progress report having mandatory environmental information disclosures, among others. In the same year, the Securities Regulatory Commission publicly encouraged Chinese investors to become Principles of Responsible Investment (PRI) signatories. Similarly, in March 2017, the China Security Regulatory Commission released guidelines for green bonds issued by listed corporates. Similarly in June 2017, the State Council announced five pilot areas for green finance with an expected cost of at least 3 trillion yuan (\$440 billion) a year. The Ministry of Environmental Protection and China Securities Regulatory Commission signed an agreement to jointly promote mandatory environmental disclosure for listed companies. To promote sustainable development it is essential to add green elements by revising commercial bank law, securities law, insurance law and other relevant laws in China (Jian, 2017) in their applicability. Also, it is required to strengthen the supervision and restraint enterprises by cultivating their environmental risk consciousness to promote green initiatives. Also, the proposed collaboration between China and France to facilitate the growth and internationalization of robust green bond markets is expected to help the country to significant progress towards green finance.

### *South Africa*

#### *Current status*

Between 2001 and 2016, South Africa lost 1.18Mha of tree cover. This loss is equal to 19.8 % of the area's tree cover extent in 2000 and equivalent to 128Mt of CO<sub>2</sub> emissions. Till date, around 77 % of South Africa's energy is generated from coal-burning power stations and the country is one of the top 20 GHG emitting countries in the world.

#### *Initiatives and observations*



Looking at the efforts towards sustainable development, from 2013 onwards, the Government of South Africa, through the Department of Environmental Affairs, has made available ZAR

1.1 billion over three years to initiate a Green Fund to facilitate investment in green initiatives. Also, the Johannesburg Stock Exchange has launched its Green Bond Segment and Green Listing Rules in October 2017 to promote green bond issuance in the jurisdiction. In the same year, South Africa has co-convened a national steering committee to identify a sustainable finance roadmap for action and was released for public consultation. Also, the National Treasury is exploring the possibility of a sovereign green bond as financing instrument.

It is estimated that financial requirements to adapt to climate change for the African region will be between US\$20 and US\$30 billion annually until 2030. This investment can be funded through green financing initiatives by tapping into a broad base of investors looking for exposure to green assets. The AfDB's African Climate Change Fund (ACCF) has aimed at providing access to large amounts of funding for African countries to scale up green finance.

### **Concluding observations**

The article makes an attempt to highlight the present status of environmental degradation in BRICS nations through various secondary sources. It provides insight into each BRICS nations' current status of environmental issues and initiatives as well as suggestions to promote green finance. The article also provides strategic actions for investment agencies and policymakers integrating different actors to ensure better growth of these countries for sustainable development.

Looking at the present importance and contribution of the BRICS nations to the world economy, it is self-evident that there are ample opportunities available to promote green finance. Budding entrepreneurs, large companies and financial agencies dealing with providing solutions towards sustainable development can find excellent business avenues. Policymakers and regulators of these countries are in the process of integrating 'green' elements in their agendas. However, considering inherent limitations of BRICS nations like growing population, limited resources, and constrained implementation and monitoring system will make execution a bit difficult but the path will surely pay huge dividends in the long run.

To boost sustainable development, initiatives like awareness creation among stakeholders, reforming fiscal policies, incentivizing R & D activities, promoting green finance projects through green bonds, integrating green credit rating assessments and creating green index are need of the hour.

Lemmet & Ducret (2017) have suggested for key strategic steps for green finance (i) ensure that finance from public development banks and United Nations funds align with the Paris Agreement (ii) encourage development agencies and banks to turn the leverage effect on private finance (from the developed and developing worlds) into a strategic objective (iii) funding cities directly or attracting private-sector finance to agriculture and forestry and (iv) technical assistance measures to be provided to support the structuring of local financial ecosystems.

To conclude, though there are efforts undertaken by BRICS nations to integrate green finance in their economic agendas there is a huge scope to incorporate and execute tailor-made policies. The execution is expected to be taken not on an ad-hoc basis but on mission-based. No exaggeration will be there if one concludes that the coming decades will primarily be built upon green foundations making the 21st century *the green century*. A step ahead can be taken by researchers by combining qualitative and quantitative analysis relating to various aspects of green finance towards impact assessment.

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