

Green Bonds: Key to Fighting Climate Change?

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ABSTRACT To successfully combat climate change, there is an urgent need to finance mitigation and adaptation efforts at various levels. Green bonds are a relatively new funding instrument for green projects that have steadily become the first line of defence against climate change. India, in particular, has immense scope to diversify the green bond market beyond renewable energy. This brief analyses the policy structure of countries that have successfully utilised green bonds. It then focuses on the untapped potential of India's institutional investors and self-help groups (SHGs) to raise capital through the retail bond market. The brief proposes a comprehensive green bond policy framework for India to strengthen and expand the current ecosystem.

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INTRODUCTION

The impacts of climate change, combined with natural-resource scarcity, pose significant challenges the world over that require immediate attention. In developing nations, particularly, the high rates of urbanisation have exacerbated the effects of climate change.¹ To address these issues, it is crucial to ensure the funding of mitigation and adaptation measures along with the efficient management of natural resources.

In India, there is an urgent need to finance green projects such as clean energy, clean transportation and water management. The Government of India estimated a cost of US\$2.5 trillion² for the implementation of its climate change actions for 2014–15 (as per 2014–15 prices).³ In recent years, India has been facing acute water scarcity in urban areas like Chennai.⁴ Indian cities require a cost-efficient system for the delivery of safe drinking water as part of its water-management strategy, and the maintenance of such a system will have great fiscal implications in the coming years. As the manufacturing and service industries of India's urban centres drive the economy, availability of water will have an impact on the performance of these growth centres. Water management and infrastructure will play a crucial role in sustaining the industries and incubating further expansion. This will be pivotal for the overall economic growth of the country.

The Indian transport sector, too, is soon set to undergo an overhaul, as the recent Budget indicates the government's intent to move towards electronic vehicles. The required R&D and infrastructure for the vehicles, the charging facilities and urban water management will need financing to fast-track growth.

Green bonds offer a viable and lucrative financing option. According to the accepted global definition, green bonds are “fixed-income financial instruments, where the proceeds are earmarked for financing green projects.” They have the potential to attract capital that can generate a positive investment cycle for green projects. In the Indian market, the Securities and Exchange Board of India (SEBI) has introduced certain guidelines for green bonds.⁵ It has allocated eight high-level categories as “green projects”—renewable energy, clean transportation, sustainable water management, climate-change adaptation, energy efficiency, sustainable waste management, sustainable land use, and biodiversity conservation.

Various studies have indicated a need for innovative solutions to boost domestic and international investment through green bonds.^{6,7} A sound policy framework for green bonds can facilitate the financing of green projects in India. In this context, India can learn from the global experience.

THE GLOBAL SCENARIO

The international guidelines brought out by the International Capital Market Association (ICMA) for green bonds are called the “Green Bond Principles” (GBP). These were first drafted in 2014 and have since gone through periodic updates.⁸ The Climate Bond Initiative (CBI) classifies the bond market associated with green bonds as “climate-aligned bond universe,” which consists of labelled green bonds, bonds from fully aligned climate issuers, and bonds from strongly aligned climate issuers.⁹ Bond issuers that derive more than 95 percent of their revenue from green business lines are fully aligned; those that derive 75–95 percent are strongly aligned. The bonds labelled “green” are

those whose proceeds are used exclusively to finance green projects. The global market of the climate-aligned bond universe stands at US\$1.45 trillion. Globally, the cumulative issuance of green bonds from 2007 to 2018 was US\$521 billion.¹⁰ Countries such as the US, China and France have built policy frameworks to promote investment in green bonds.

China

The first country-specific green bond issuance guidelines in China were formulated by the Peoples' Bank of China in 2015.¹¹ Xinjiang Goldwind Science and Technology issued the first green bond to raise US\$300 million, with a three-year maturity period. Since then, China's green bond market has seen significant growth.¹² By official government definitions, the market was valued at US\$36.2 billion in 2016 and US\$37.1 billion in 2017.

The largest share, in terms of use of proceeds, is renewable energy, followed by clean transportation. In addition to the increase in offshore green bond issuance to finance the Belt and Road Initiative (BRI), the Chinese government has also taken measures to improve the domestic market. In July 2017, China launched the Bond Connect Scheme to attract foreign investments in the green bond segment. In September 2017, the China Development Bank issued the first retail green bond for individual investors and non-financial institutional investors.¹³ Retail investors received a 25-percent tax exemption on interest income. The Agricultural Development Bank of China issued Renminbi (RMB) dominated green bonds worth RMB 3 billion in June 2018, and it was oversubscribed by 4.75 times. Further, China has collaborated with the Luxembourg Stock Exchange to list out price information for green bonds.

The Hong Kong government is heavily invested in promoting green financing, and to this end, established the Hong Kong Green Finance Association in 2018. The government is also set to launch the world's largest sovereign green bond issuance programme worth HKD 100 billion. In 2019, the inaugural issuance of green bond had raised \$1 billion which started off the ambitious programme.¹⁴

The certification of green bonds requires external reviews, which costs approximately US\$10,000–100,000. To promote certification, the Hong Kong government started the Green Bond Grant Scheme (GBGS) in 2018. It subsidises certification of green bonds for eligible issuers under the Green Finance Certification Scheme, by bearing the full cost of the external reviews, with a cap of HKD 800,000. In the same year, the Hong Kong government launched the Pilot Bond Grant Scheme, which bears 50 percent of the issuance expenses to aid eligible first-time issuers.

The Chinese transport sector, led by China Railway, is a major issuer of AAA-grade strongly aligned climate bonds and the largest issuer of climate-aligned bonds in the world. As of 2018, the China Railway Corporation held US\$172 billion worth of outstanding bonds.

In an annual meeting early this year by the Macao International Environmental Cooperation Forum and Exhibition, the CEO of CBI, Sean Kidney talked about how China can influence urban environmental policy in Asia through the BRI. Issuance of green bonds and conducting green trade fairs focusing on the BRI can mark a new chapter for the green economy of China as well as other participating nations.¹⁵

The United States

The Bank of America was one of the first corporates to have issued green bonds. In 2013, the US municipality issued the pioneering, self-labelled green bond¹⁶ as well as bonds that were considered “green” by market standards under the federal Clean Renewable Energy Bond (CREB) and the Qualified Energy Conservation Bond (QECCB). These bonds are attractive for various municipalities due to their direct-subsidy structure. The CBI conducted a study that found US\$250 billion in issuance from fully aligned US municipal climate-bond issuers.¹⁷ The outstanding amount of labelled green bonds stood at US\$14 billion, issued by 23 municipal agencies.¹⁸

The CBI study further found that the water sector, the largest climate-aligned theme for fully aligned bond issuers, was estimated at US\$170 billion outstanding bond issuance amount. Given the current water crises in many parts of the globe, the US has increased focus on financing water-related projects. A Global Water Intelligence study estimates that US\$450 billion must be spent on water and sanitation by 2030 to achieve the Sustainable Development Goals (SDGs). In 2005 and 2008, respectively, the US federal government authorised the issuance of tax credit green bonds under the CREB and QECCB programmes, which give investors tax credit instead of interest payment.¹⁹ However, the implementation of the Tax Cuts and Jobs Act, 2017 stopped issuance of tax credit bonds by repealing section 54C of the Internal Revenue Code. Despite this, some states such as Arkansas and New Mexico have retained CREBs.

A discussion of the Massachusetts green bonds and the DC water green bonds will help understand some of the strategies that the US has deployed to increase the efficiency of the green bonds. In 2013, Massachusetts issued

green bonds for the first time, to align investors to socially responsible and transparent environmental projects. The funds raised were spent on four major areas: clean and safe drinking water, river revitalisation and habitat protection, land acquisition and open-space protection, and energy efficiency and conservation.²⁰ In September 2014, the Massachusetts Treasury opened the bond for the sale of US\$350 million, and sold worth US\$1 billion.²¹ The project was highly successful because of the strategies put in place by the Treasury. They anticipated demand from investors and identified all the environmental projects that could be funded by the green bonds. The monitoring system was robust, being based on the World Bank Green Bond Model. This project financed site-specific audits of 149 hazardous waste sites across the commonwealth.

The green bond issued by the District of Columbia Water and Sewer Authority (DC Water) is also interesting for its unique strategy. Washington D.C.’s ageing infrastructure was causing an annual release of almost three billion gallons of raw sewage into its rivers (especially Anacostia). To address the issue, DC Water launched its Clean Rivers Project, which required the construction of a 13-mile-long tunnel. The project is set to be completed in 2030, with a total cost of US\$2.6 billion, and is aimed at reducing sewer overflow by 98 percent to River Anacostia.

In 2014, DC water issued a green bond which was unique because of its 100-year maturity period. Since the municipality bond market did not have the required liquidity for such a long maturity period, the bond was issued in the corporate market without any tax exemption. This was the first attempt to issue a green century bond by a water utility in the US. Viego was chosen as an external reviewer to assess the

issuer on the environmental, social and governance (ESG) criteria. Barclays and Goldman Sachs provided expert opinion. The green bond was in high demand in the corporate market, which led to an increase in the initial target of US\$300 million to US\$350 million, with a reduced interest rate. Subsequently, DC Water issued a third set of green bonds worth US\$100 million to fund the project. This lot was tax-exempted, with a credit rating of AAA.²² The expected outcome of the project is to improve water quality, creating economic development in the surrounding areas of River Anacostia.

Brazil

Amongst the few innovative cases in the global green bond market, that of Brazil's Suzano Pulp and Paper S.A. is notable. Suzano launched BB+ grade green bond worth US\$500 million, for a maturity period of 10 years and at a coupon rate of 5.75 percent. This was one of the first forestry-based green bonds issued outside Scandinavia. The bond was certified by Sustainalytics, as an external agency, and its total demand exceeded US\$1,500 million.

In 2016, the Brazil Green Finance Initiative (BGFI) was launched by the Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável CEBDS and the CBI. The BGFI has 27 representatives from domestic pension funds, insurance companies, banks, major industry sectors and investors, and it aims to develop the domestic green finance market and attract international capital.

THE SCOPE OF GREEN BONDS IN INDIA

Renewable Energy

India's renewable energy sector requires significant financing, which presents one of the

biggest opportunities for green bonds. The country needs US\$4.5 trillion within the next 10 years to meet its targets of renewable energy and urban sustainability,²³ and green bonds can attract sizeable investment to fulfil this requirement.

In recent years, there has been a policy push by the GoI towards electric vehicles (EV). The recent Union Budget reduced the goods and services (GST) slab for EV from 12 percent to five percent. To further boost its demand, the government has allowed an income tax deduction, with a ceiling of INR 1.5 lakh, on loans taken for the purchase of EVs. This move is expected to save the taxpayer INR 2.5 lakh over a period of five years.²⁴ Additionally, the government think tank, NITI Aayog has proposed that only EVs should be sold in the category of three-wheelers and two-wheelers below 150 cc, from 31 March 2023 and 31 March 2025, respectively.²⁵ In light of these policy changes, the demand for charging infrastructure and technology is set to increase in the coming years. Car manufacturers and charging facility providers can use green bonds to raise capital from the retail and corporate markets. The financiers in the sector can use asset-backed securities to ease their balance sheets for further lending, and large original equipment manufacturers can issue green bonds based on their creditworthiness.²⁶ These measures can create a healthy financial ecosystem to facilitate climate change mitigation efforts.

In recent years, climate resilience and adaptation have become a primary concern. Changes in rainfall pattern and increased intensity of sudden-onset weather events such as tropical storms have changed the overall risk portfolio of most businesses and settlements. The CBI released in September this year a set of

“Climate Resilience Principles” to address the risk profile and promote a climate-resilient economy. Both new and existing investment in built and natural environments must follow these principles, quoted below:²⁷

1. They recognise that infrastructure design and construction today must incorporate the climactic conditions of tomorrow, the expected volatility and extremes already ‘baked in’ to our global systems
2. They require that measures are taken in asset or project design, in construction or retrofits, that ensure the asset or project is ‘fit for climate purpose’ over its operating life
3. They recognise that the definition of ‘fit for purpose’ must now automatically include climate resilience and adaptation measures, or that the project itself must increase the climate resilience of broader systems and networks within the built environment or natural ecosystems

Disaster Management

Disaster management is another significant area where green bond investments can be utilised, especially by coastal states that are becoming increasingly more vulnerable to tropical storms and cyclones. In the aftermath of cyclone Fani, for instance, it is estimated that the state of Odisha will need some US\$14 billion to rebuild its infrastructure.²⁸ Climate change, which results in the warming of the oceans, has further intensified such extreme weather events.²⁹ Therefore, the rebuilding strategy must include the creation of more storm-resilient infrastructures to handle similar future events. According to the SEBI guidelines for green bonds, such investments come under the category of “climate change adaptation.”

Agriculture

Primary sectors such as agriculture play a crucial role in developing the Indian economy and creating in-situ employment.³⁰ However, the contribution of the agriculture sector in the Indian economy has steadily decreased at a rate of 14.4 percent in gross value added since 2015–16. Under the SEBI guidelines, organic farming, zero-budget natural farming and sustainable irrigation practices come under sustainable land use and sustainable water management. Some capital-intensive technologies, such as drip irrigation and farm-level anaerobic digestion of manure and crop waste, can be linked with green bonds to fast track fund-raising.³¹ The CBI is now collaborating with the World Resource Institute (WRI) to explore the possibility of issuing adaptation and resilience bonds for the agriculture sector in India.³² Green practices can bring in new investment and become the engine of growth in the agriculture sector, which can help India become a US\$5-trillion economy by 2024.

Water Infrastructure and Management

Another sector with high capital requirements is water infrastructure and management, due to the urgent measures needed to tackle the ever-growing problem of water scarcity in the country. For instance, the Paradip Port Trust of Odisha has planned to set up a desalination plant, with a 10-million-litre per day capacity, and will require an estimated investment of INR 116 crore.³³ The Reserve Bank of India (RBI) has recognised the need for funds in this sector, at both household and enterprise levels. WASH (water, sanitation and hygiene) has been included in “priority-sector lending,” and SHGs are linked with toilet construction through the National Rural Livelihood Mission (NRLM) and State Rural Livelihood Mission (SRLMs).³⁴

A framework for green bonds can therefore be built with a strategy of aggregation and securitisation, linking the SHGs with programmes such as the National Rural Drinking Water Programme (NRDWP). By 2050, an estimated 50 percent of all Indians will be living in urban areas.³⁵ Cities are already facing water crises, and the situation will only deteriorate if not managed properly. Urban public water delivery systems will require substantial funding to tackle the water crisis. According to the Ministry of Housing and Urban Affairs, US\$550 billion (2009–10 prices) are needed to build the urban infrastructure planned for construction over the next 20 years. Around 20 percent of the amount will be spent in water supply, sewerage, storm-water drain and solid-waste management.³⁶

Forestry

The Indian forestry sector is yet to sufficiently explore green bonds in fund-raising. Both corporate and government funding can be streamlined into the forestry sector through the issuance of green bonds. The agroforestry industry can benefit from green bonds through planned forestry and help India achieve its target of 33 percent forest cover, of the total land area of the country.³⁷ Green bonds can be used to raise funds to protect and conserve the existing forest ecosystems. This will be relevant especially in the Biodiversity Reserves and National Parks where tourism is proving to be successful. The government can issue green bonds in this sector and enable securitisation through a common corpus such as the National CSR Fund³⁸ or the Green Climate Fund.

In this scenario, the government can provide guarantee through funds to lower risks and improve credit rating. Guarantee provided by

funds such as those will reduce investor's risk, and therefore the bonds can be issued at a lower interest rate. Additionally, tax credit bonds can be issued and made transferrable, to make the offer more lucrative for the investors. These bonds are not issued with the purpose of fixed return and provide absolute tax benefit to the investor.

Coastal Preservation

The rise in sea levels is a significant threat to coastal cities and ecologically sensitive areas of India. According to the GoI, the sea level has risen 1.3 mm/per year along the Indian coasts in the last 40 to 50 years.³⁹ With rising sea levels, the frequency of floods will increase significantly along with the cost to the economy. The 2005 flood, for instance, cost Mumbai US\$1.7 billion in damages in a single day.

There are two ways of preventing seawater inundation, and both require substantial financing. The cities can either build hard infrastructure, such as sea walls and levees, or aim for beach nourishment.⁴⁰ For example, the US has utilised over US\$787 million from 1995 to 2002 for beach nourishment.⁴¹ Long-term green bonds will provide one of the solutions in terms of raising capital to implement such projects in high-risk areas.

POLICY FRAMEWORK FOR GREEN BONDS IN INDIA

India has the potential to become a leader in the green bonds market. However, it must first formulate a comprehensive national policy framework, which can identify areas to promote issuance and investment of green bonds as well as minimise the possibilities of “greenwashing.” According to Delmas and Burbano, greenwashing is the intersection of “poor

environmental performance and positive communication about environmental performance.”⁴² Listed below are measures that will help promote the overall ecosystem of green bonds in India.

1. **External verification of green bonds** can increase investor confidence and avoid greenwashing. External verification can be done in two ways: second-party review, as done by companies such as KPMG, Sustainalytics and Viego; and third-party certification, provided exclusively by the CBI. While extremely useful, external verification is a high-cost process. Therefore, the government must provide subsidies and tax incentives to first-time issuers.
2. **Securitisation**, on a case by case basis, can increase the credit ratings of green bonds. Public-sector banks, non-bank financial companies (NBFCs), the National Bank for Agriculture and Rural Development (NABARD), and corpuses such as the National CSR Fund, National Disaster Response Fund and State Disaster Response Fund can provide securitisation for the issuance of industry-grade green bonds.
3. **Public infrastructure** in cities, such as water and waste management, can be linked with municipality bonds.
4. The **issuance of sovereign green bonds** and rupee-dominated sovereign green ‘Masala’ bonds can attract international investment. Currently, bonds worth approximately US\$13 trillion, i.e. one-fourth of all global bonds, show negative yield. India can leverage this situation to increase investment in its bonds,⁴³ including green bonds, and use third-party certification to further facilitate such investment.

The Netherlands, for instance, launched a certified sovereign green bond on 21 May 2019, worth EUR 5.98 billion. The bond was AAA grade, and the bid amount reached EUR 21.2 billion within 90 minutes of the launch. Investors considering the ESG criteria were given preference in the bid, with priority allocation of up to 10 percent of their bid amounts.⁴⁴ However, in the case of dollar-dominated sovereign green bonds, caution is advised. In the current market scenario of economic slowdown, further depreciation of the rupee may increase the redemption cost. Sovereign and corporate green ‘Masala’ bonds, on the other hand, are prudent options and must be actively pursued. In 2016, NTPC raised INR 2,000 crore by issuing a corporate green ‘Masala’ bonds.⁴⁵ Issuance of sovereign green masala bonds will draw foreign direct investment in the green sector, with reasonable yields for the investors, who will also bear the risk of currency fluctuations.

5. The **rural sector** has immense untapped potential when it comes to funding green projects. India has 87 lakh SHGs with a total deposit of more than INR 19,500 crore and an annual total credit off-take of INR 47,000 crore, as of 2017–18.⁴⁶ Here, aggregation can be used to accumulate the fund and invest it in green bonds issued by various public- and private-sector bodies. The NABARD, public-sector banks and NBFCs can provide securitisation, and the funds raised can be utilised in various infrastructural projects in rural India. More research is needed in this area to analyse the intricacies of implementation.
6. The **retail bond market** can be tapped by making it mandatory for institutional

investors to purchase green bonds. For instance, a policy mandate can be issued for companies to invest one to two percent of the total annual portfolio in green bonds. The move will be a step towards ensuring ESG compliance in the retail bond market.

7. The **RBI can put guidelines in place** detailing the eligibility of green projects, reporting methods and management of proceeds. This will reduce ambiguity and increase investor confidence, fuelling the overall growth of investment to the green sector.

CONCLUSION

The impact of climate change poses a significant threat to the everyday lives of people, at both

local and global levels. To prevent the loss of human and economic capital, mitigation and adaptation measures require urgent financing. This can be achieved by channelling corporate, government and retail funding to the green sector.

This brief explored the scope of green bonds in India. It proposes possible measures to create a comprehensive policy structure to promote the use of green bonds, which have the potential to become a vital financing vehicle for green projects. To this end, the Reserve Bank of India must establish a nationally accepted standard definition of green bonds as well as guidelines on the management of its proceeds, to avoid ambiguity and increase transparency. Further, the Indian Parliament must provide legislative support by enacting a green bond law through its Upper and Lower houses. [ORF](#)

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