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Green Finance for Public Enterprises in India

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Abstract

This paper examines the burgeoning landscape of green finance for public enterprises in India, exploring its potential to reconcile economic growth with environmental stewardship. Through a comprehensive literature review and case study analysis, the research investigates the regulatory frameworks, market mechanisms, and policy initiatives shaping the adoption of green finance practices within Indian public sector entities. The study scrutinises the multifaceted challenges and opportunities inherent in this transition, considering India's unique socio-economic context and the legacy structures of its public sector. By evaluating policy effectiveness and drawing comparisons with international best practices, this research contributes to the nascent body of literature on green finance in emerging economies. The findings illuminate pathways for enhancing the environmental sustainability of India's public enterprises through innovative financial instruments and strategies, whilst offering insights that may inform policy formulation and institutional reforms in the broader context of sustainable development.

KEYWORDS: Green Finance, Sustainable Finance, Green Bonds, Public Enterprises

Introduction

The nexus of environmental sustainability and public sector finance has emerged as a critical area of inquiry in the contemporary global economic landscape. Within this context, the concept of green finance for public enterprises in India presents a particularly compelling subject for academic scrutiny. As the world's most populous nation and a rapidly developing economy,

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India's approach to reconciling economic growth with environmental stewardship carries profound implications for global sustainability efforts.

Public enterprises in India, which have historically played a pivotal role in the country's economic development, now find themselves at the forefront of a paradigm shift towards environmentally conscious operations and investments. The imperative to integrate green finance principles into these entities stems from a confluence of factors, including mounting environmental concerns, international climate commitments, and the recognition of sustainable development as a cornerstone of long-term economic resilience.

This paper seeks to examine the multifaceted landscape of green finance as it pertains to Indian public enterprises. It will explore the regulatory frameworks, market mechanisms, and policy initiatives that are shaping the adoption of green finance practices within these organisations. Moreover, it will critically analyse the challenges and opportunities inherent in this transition, considering the unique socio-economic context of India and the legacy structures of its public sector.

By scrutinising a case study of solar energy in Indore, India, evaluating policy effectiveness, and drawing comparisons with international best practices, this research aims to contribute to the nascent but rapidly evolving body of literature on green finance in emerging economies. The findings of this study hold the potential to inform policy formulation, guide institutional reforms, and illuminate pathways for enhancing the environmental sustainability of India's public enterprises through innovative financial instruments and strategies.

As the global community grapples with the exigencies of climate change and environmental degradation, the role of green finance in transforming public enterprises cannot be overstated. This paper endeavours to shed light on this crucial intersection of public policy, finance, and environmental sustainability in one of the world's most significant emerging economies.

Literature Review

We provide a brief review of existing literature on green finance drawn from various sources. The existing literature points out the adoption of green finances across different sectors in compliance with the Paris Agreement towards sustainable development and optimizing the cost of capital. Financial institutions are at the forefront of promoting green finance and offering incentives to entities willing to disclose this concept in the public domain (Aracil et al., 2021). The project appraisal by these institutions puts a premium on Green Finance. Green Finance has received wide support from investors as it is more than gaining optimal proceeds from investment. More than 800 institutional investors exist presently across the globe, owning assets over $3 trillion as part of investment in green finance such as stocks, bonds, and bills (Brears, 2022). The proportion of green finds in the market has recorded a significant rise over the years, with the pace still expected to expand further with China, the U.S., and France being the largest issuers of green bonds.

The burgeoning field of green finance has garnered significant attention in recent years, as global concerns about environmental sustainability and climate change have intensified. This literature review aims to synthesise and critically analyse the current state of research on green finance, drawing upon a comprehensive array of scholarly works published between 2014 and 2022. The concept of green finance, broadly defined as financial investments and services that support environmentally sustainable development and growth, has emerged as a crucial mechanism for addressing climate change and promoting ecological conservation (Amoah et al., 2022). De Cunha et al. (2021) map and integrate the key components of the sustainable finance and investment area and pinpoint the most pertinent directions for future study based on a thorough literature evaluation of 166 articles. During this process, they come to the conclusion that the main problems facing the field are the under-theorisation of the notion, the conventional short-term character of financial reasoning, and the absence of evidence of the repercussions on society and the environment.

The literature reveals a multifaceted landscape, encompassing various financial instruments, regulatory frameworks, and market dynamics that collectively contribute to the greening of the global financial system. Al Nuaimi & Nobanee (2019) demonstrate the value that sustainable approaches bring to particular businesses and industries. They show how managers may make better judgements by integrating sustainable policies into financial decisions. In order to ensure that sustainability elements are seamlessly integrated into financial systems, their report offers an outlook on the risks related to the sustainability effort and how those risks might be managed.

A recurring theme in the literature is the pivotal role of green bonds in advancing sustainable finance. An et al. (2021) look into a supply chain system where a manufacturer with little capital and a well-funded supplier dealing with erratic demand looks to banks for green credit financing in this scenario. They discover that there are areas where the manufacturer's profit and social welfare can coexist together. By imposing various carbon restrictions, the government may direct producers towards a decision that benefits everyone.

Shinde (2021) posits that green bonds serve as an effective investment tool for fostering a resilient future and achieving circular economy objectives. This view is corroborated by Gilchrist et al. (2021), who conducted a comprehensive survey of literature on green bonds and loans, highlighting their potential benefits whilst also acknowledging the limitations of these instruments. The evolution of green bonds is further elucidated by Trompeter (2017), who traces their development from niche products to mainstream financial instruments, exploring the associated environmental paradox within Wall Street's paradigm. AlAhbadi et al. (2020) attempt to find out how sustainability bonds function to balance the value that stakeholders place on businesses across the globe through implementation of a systematic review. According to the study, which was based on 25 research publications that were chosen from a variety of databases, including SCOPUS, EBSCOHOST, and SSRN, sustainability bonds can help commercial organisations across borders gain a competitive edge with stakeholders.

Bjørnbet et al. (2021) want to evaluate the significant relationship between the circular economy in manufacturing and sustainable development through a thorough analysis of the literature. The review demonstrates that the area has progressed from conceptual work alone to empirical investigations and research leading to practical instruments. To prevent implementing solutions that may be portrayed as circular but ignore the sustainability component, holistic methods are required.

The geographical scope of green finance research is notably diverse, with a particular emphasis on emerging economies. China, for instance, features prominently in the literature as a case study for green finance implementation and policy effectiveness. Zhang et al. (2019) offer a bibliometric analysis of green finance research, revealing the current status, developmental trends, and future directions of the field, with a notable focus on China's green finance initiatives. Liu & Xiong (2022) examine the impact of green finance reform on corporate innovation in China, whilst He et al. (2019) investigate the relationship between green financial development and renewable energy investment efficiency in the Chinese context.

The literature also highlights the intricate relationship between green finance and broader economic objectives. Falcone and Sica (2019) assess the opportunities and challenges of green finance in Italy, specifically within the biomass production sector, underscoring the critical role of green finance in environmentally sustainable innovations. Similarly, Soundarrajan and Vivek (2016) explore the potential of green finance in fostering sustainable economic growth in India, emphasising the need for reorienting banking and capital markets to enhance the supply of green finance.

A significant strand of research focuses on the performance and efficacy of green finance initiatives. Julia and Kassim (2020) compare the green banking performance of Islamic banks and conventional banks in Bangladesh, utilising the Maqasid Shariah framework. Their findings suggest that Islamic banks demonstrate superior performance in preserving faith, intellect, and wealth circulation. In a broader context, Khan et al. (2022) conduct an empirical investigation into whether green finance delivers on its promises, analysing its impact on ecological footprints across 26 Asian economies.

The literature also grapples with the governance challenges posed by the sustainable finance revolution. Park (2018) examines the role of investors as de facto regulators in the green bond market, highlighting the need for a public-private hybrid regulatory framework to optimise stakeholder interests. This governance aspect is further explored by Dong et al. (2020), who analyse China's financial sector sustainability and green finance disclosures, revealing an evolving landscape of regulatory and operational requirements.

Notably, the literature identifies several gaps and future research directions. Zhang et al. (2019) call for increased attention to green finance in developing countries, whilst Chemmanur and Fulghieri (2014) emphasise the need for greater innovation in entrepreneurial finance to support sustainable ventures. Hafner et al. (2020) advocate for a systems perspective in addressing the green finance gap, suggesting policy interventions to improve both green project financing and the broader financial ecosystem.

The literature on green finance presents a rich tapestry of research, encompassing theoretical frameworks, empirical analyses, and policy recommendations. While significant strides have been made in understanding the potential of green finance to drive sustainable development, challenges remain in terms of standardisation, measurement, and implementation across diverse economic contexts. Future research should focus on developing more robust methodologies for assessing the impact of green finance initiatives, exploring the intersection of green finance with emerging technologies such as fintech, and investigating the long-term economic and environmental outcomes of green finance policies. As the global community continues to grapple with the urgent need for sustainable development, the field of green finance is poised to play an increasingly critical role in shaping the future of the global economy and environment.

Green finance for public sector

The disinvestment targets of the government have fallen short of expectations (Nandy & Sur, 2024). The government has been trying to make the shortfall good by increasing enhanced dividends. A superior earnings management can be of great help in this regard. It may be noted that one of the critical limitations eroding the earnings of public enterprises has been the cost of capital. The higher cost of funds makes public enterprises uncompetitive in domestic and international markets. It impacts the purchasing power of the Indian consumer and perpetuates multidimensional poverty. A large chunk of investments in public enterprises belongs to the energy and transport sectors. Enterprises in these sectors are highly investment-prone and continue to have an unlimited appetite for funding. Green Finance has emerged as an important source of raising cheaper finance for these enterprises and contributes to their effective corporate governance and discharging corporate social responsibility. Equity financing from the government and retained earnings are considered cost-free sources in the case of these enterprises. It is thus obvious that the real cost of capital is far higher than the actual one. It is high time that public enterprises look beyond debt and equity from the government and tap green finance as alternative instruments of finance. Green Finance will provide public enterprises with economic, social, and governance benefits. Clean finance will combat pollution, low-carbon finance will reduce Greenhouse gas emissions, bio-finance will contribute to biodiversity, climate finance will lead to climate change adaptation, and blue finance will foster a blue economy (In et al., 2017). Social finance will provide the wherewithal to public enterprises engaged in education, social housing, health, affordable food, affordable infrastructure, and financial services.

The instruments can be accessed by the government, national development financial institutions, commercial banks, capital markets, and private equity. Government instruments include green subsidies, public spending, public investments, and green facilities. National development financial institutions provide blended finance, green public funds, green project guarantees, concessional funding, transition finance, and credit enhancement. Commercial banks lend green credit, green loans, sustainability-linked loans, and green insurance. Capital market instruments relate to green bonds, green sukuk, transition bonds, social bonds, and sustainability-linked bonds. Capital markets provide Environment, Social, and Governance funds and green-themed funds. Private equity involvements are seen in green innovation funds and sustainability funds. While structuring the capital mix, it has to be borne in mind that green finance instruments require positive financial returns for investors. Government funding or, partly, development finance funding may be exceptions in this regard.

Green bonds vary in type, use, and debt recourse. "Use of proceeds" bonds are earmarked for green projects and with recourse to the issuer. Green project bonds are earmarked for green projects with recourse to the project's assets and balance sheet. Securitisation bonds are employed to refinance portfolios of green projects with recourse to a group of projects. A challenge for public enterprises is to select the right standard as various standards for green bonds have come to stay in existence. The difference between the standards may relate to the type of eligible projects and the use of proceeds requirements. Securities and Exchange Board of India laid down such standards in 2017 as disclosure requirements for the issuance and listing of green debt securities. These include a list of broad projects and asset categories for eligible use of proceeds. A green bond issue can attract individual investors as they perceive a lower risk. It can provide 'greemium', improve corporate governance, public reporting and improve corporate strategy. Green bonds reduce the risk of stranded assets.

The Government of India, the Reserve Bank of India, and the Security and Exchange Board of India have taken several initiatives to promote green finance in India, including, among other things, the implementation of mandatory sustainability disclosure and bringing the production of renewable energy under priority sector lending scheme, measures that incentivise the production and usage of unconventional energy by firms and households. India has commenced its journey for carbon neutrality and put forward a 'Green Deal' to be achieved by 2070. The Green Deal has classified green finance as an enabler to accelerate decarbonisation. It emphasises the need for an increased flow of capital from the national government and private entities to establish green infrastructure.

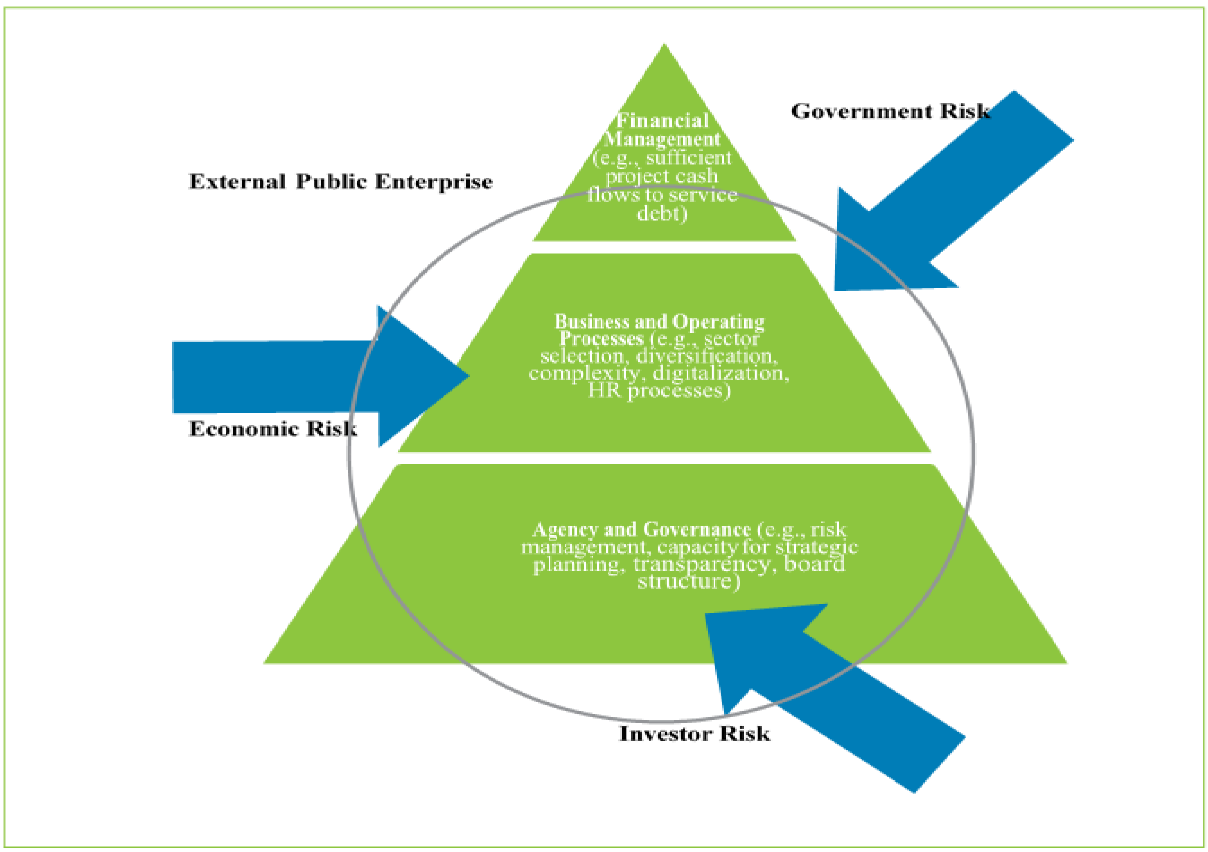
Finally, the choice of selecting the right green finance instrument would depend on factors such as the type, duration, profit motivation, capacity, operational efficiency, and transparency. ESG funds and green bonds are characterised by longer duration, proposed motivation, risk, high exposure to the market, and high transparency. Green credit and blended finance are for a medium duration and characterised by moderate profit motivation, risk, operational efficiency, and transparency.

Requisite factors for issuance of green bonds

Public Enterprises intending to access green finance should have bankable green assets based on applicable domestic or internationally recognised processes and standards. Government can support public enterprises by creating an enabling environment and tackling governance issues. A better grip on capital market-related issues can help in raising green finance from its constituents successfully. Similarly, the regulators may have to put in place moderately liberal standards. On the score of public enterprises strong stakeholder engagement and timely and regular reporting on the use of proceeds can be helpful in garnering green finance (Nuaimi & Nobanee, 2019). Figure 1 incorporates the determinants for issuing successfully green bonds.

Figure 1.

Determinants for Mobilizing Green Bonds



Source: Asian Development Bank (2021a)

Green bonds can be an investor's choice provided the issuer has sound cash flows and the hedge has the risks (AlAhbabi & Nobanee, 2020). Economic risks can impact a project and jeopardise the mobilisation of green finance. Internally, deficient operational processes can hit the revenue and impact cash flows adversely. As a corollary, good financial management can ward off any turbulence in projected cash flows. However, these do not obviate the need for setting up an independent unit managing green finance.

A comprehensive process for developing and managing green financial instruments, within a sustainable finance framework needs to be followed (Asian Development Bank, 2021b). This intricate procedure commences with the identification of environmentally beneficial projects and assets, which serve as the foundation for the subsequent stages. Following this crucial initial step, the focus shifts to the formulation of a robust green bond and sustainable finance framework, establishing the parameters and guidelines that will govern the financial instrument. Once the framework is in place, the process moves inward, concentrating on the confirmation of internal processes and controls. This stage is vital for ensuring the integrity and credibility of the green bond issuance. Subsequently, the emphasis transitions to external communication, with the reporting of allocations and green credentials. This transparent disclosure is essential for maintaining investor confidence and regulatory compliance.

The process then evolves to address the broader implications of the green bond issuance. Setting up for impact reporting becomes a priority, as it allows for the quantification and communication of the environmental benefits derived from the financed projects. This is followed by the management of the external review process, a critical step in validating the green credentials of the bond and ensuring alignment with international standards and best practices.

As the process advances, it reaches a stage where formal recognition is sought through certification. This external validation enhances the credibility of the green bond and potentially broadens its appeal to environmentally conscious investors. The subsequent phase involves engagement with a diverse array of stakeholders, including media outlets, relevant indexes, and listings. This multifaceted engagement strategy aims to increase visibility and attract a wider investor base.

The final stages of the process focus on the long-term management and expansion of the green bond programme. Post-issuance reporting and disclosure become ongoing responsibilities, ensuring continued transparency and accountability to investors and regulators alike. The culmination of this process is the potential for further issuance of labelled instruments, leveraging the established framework and reputation to expand the organisation's portfolio of sustainable financial products.

This comprehensive approach to green bond issuance and management reflects the growing sophistication of the sustainable finance market. It underscores the intricate balance between environmental integrity, financial viability, and stakeholder engagement required to successfully navigate the complexities of green finance in today's global markets.

Case study of financing of solar plant

Rapid urbanisation is a part of India's development strategy. Much of India's population is designed to be urban-based. This causes a financial challenge to urban governance. Municipal corporations are in a deep financial crisis. The reliance on municipal corporations has to shift from governmental to non-governmental resources. Recommendations for bridging the significant gap in funding at the local level regularly highlight the need for municipalities to take on debt financing mechanisms. There is a growing interest in green bonds as a way to mobilise resources for green infrastructure, resulting in India becoming the world's second-largest market for green bonds in 2020. Though the current green bond activity is led by the private sector, India issued its first sovereign green bonds in January 2023 and municipalities have been entering this space as well—Ghaziabad Nagar Nigam in 2021 and Indore Municipal Corporation in 2023 (Gangamreddypalli, 2023).

Green bonds represent access to scalable, long-term, low-cost debt capital. They offer certain advantages over other financing mechanisms such as loans and grants. They are useful in terms of borrowing size which gives access to large upfront capital, and long maturity periods which often span about 10 years in India, allowing long-term manageable repayments. Green Bonds have to be credit-rated. Among the recent wave of issuances, Indore Municipal Corporation's public issuance of municipal green bonds in 2023 to finance the solar plant stands out in a few ways. This issuance made Indore Municipal Corporation India's prominent local government body raise money from retail investors. Indore Municipal Corporation is characterised by a strong economic base, efficient operations, and service delivery track record, satisfactory financial performance, structured payment mechanism, focus on asset creation and cost saving, and healthy financial position.

This Green Bonds issue was regulated by the Securities and Exchange Board of India which prescribes a four-fold process for issuing the Green Bonds: Appointment of intermediaries such as merchant bankers, rating agencies, registrar and transfer agents, and debenture trustees; preparation of Information Memorandum requiring data collection, structuring of Green Bonds and repayment, preparation of cash flow statement and draft information memorandum as per the guidelines indicated by the regulators; creation of escrow account and obtaining a rating letter, and launching issue/bidding process and taking it to the conclusion.

The bond offer document submitted to the Securities and Exchange Board of India incorporated the details regarding the nature of the instrument, mode of issue, issue size, coupon rate, tenor, credit rating, collateral, and purpose. Indore Municipal Corporation issued the green bond to finance the installation of a 60MW ground-mounted captive solar PV power plant at Jalud pumping station to fetch water from the Narmada River. The solar power plant is envisioned as a mechanism for saving up to INR 840 million (USD 10 million) per annum. Carbon credits generated through this project are to be traded on the global carbon credit market. It is not that the project is not faced with any risk. The project faces internal risks, financial risks, and external risks. However, the cost of funds and their application override the benefits. The green bonds are eligible for the Government’s incentive of approximately 10 per cent up to a maximum of INR 200 million (USD 2.37 million). Further, Indore Municipal Corporation is also entitled to the Viability Gap Funding. The issue was received very well and oversubscribed 1.24 times. The institutional investors showed significant interest by subscribing 1.76 times and the retail investors subscribed the issue by 1.18 times.

Strategies for Stepping Up Mobilisation of Funds from Green Finance

Green Finance offers a vast scope for raising capital by public enterprises. It is necessary to formulate strategies to enable enterprises to progressively increase the share of green finance in their capitalisation (Liu & Xiong, 2022). We suggest below some of these strategies.

1. Transformative Reforms: Developing the national capital markets for sustainability will give a fillip to green bonds, green Initial Public Offers, and other green instruments mentioned earlier. It would allow for coordination among policymakers, regulators, institutional investors, and consumers while spreading awareness, understanding, and availability of green investment options over brown alternatives. A strategy to set up a green finance exchange or make it a part of social capital exchange can be a bold step.

2. Institutional Reforms: The entire spectrum of financial institutions can be examined to ascertain the gaps or absence in regard to providing green finance. Key financial institutions supporting decarbonisation and climate resilience should be strengthened, and the conversion of development finance institutions into commercial banks should be reconsidered in order to fill the gap created by absent long-term financing at reasonable interest rates. Banks can play an important role in providing green finance to public enterprises. Banks should avoid green washing.

3. Regulatory reform: Sovereign funds, pension funds, and insurance companies should be encouraged to invest in green finance schemes floated by public enterprises. By doing this they will only reduce the market risk and promote investor protection. Regulatory reforms should be introduced to reduce the compliance burden on these enterprises. Tax concessions can be extended to retail investors. This will help in the spread of eco-awareness by way of differentiating between green and brown assets (Desalegn & Tangl, 2022). The government can consider credit enhancement and guarantees to help hedge the perceived risks and enhance the overall credit rating of green bonds.

Conclusion

Public Enterprises/State-owned Enterprises continue to occupy the commanding heights of the Indian Economy. These enterprises are endowed with two special features which separate them from enterprises in other sectors: 'public' and 'enterprise'. Being 'public' in nature, they should serve social purposes, and being 'enterprise' in nature, they should produce goods and services at the least cost. Green Finance offers an olive branch to these enterprises to achieve both ends. Green Finance with its availability at a lower cost of capital can be available in abundance both to such enterprises in India and abroad. Green Finance Instruments can be designed in different ways to suit their requirements. Transformative reforms need to be introduced to attract, among others retail investors, pension funds, provident funds, insurance funds, private equity, and sovereign funds. Tax concessions and capital market reforms can increase the effectiveness of green finance for public enterprises.

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