Green Management and AI Driven Financial Strategy: Catalyzing BRICS Growth for Viksit Bharat

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Abstract: Green management emerges as a pivotal strategy for sustainable development. This approach integrates environmental sustainability into organizational practices, aiming to reduce non-ecological impact while enhancing operational efficiency. This study explores how the general public's growing interest in EmFi is reshaping financial services and influencing the creation of digital ecosystems across various industries and organizations. The risks of EmFi and AI, including cybersecurity, data privacy and regulatory compliance are highlighted by the study while it also stresses on how technological progress must go hand in glove with green management practices. In the current scenario, AI has emerged as a critical driver of corporate value and strategy in this digital age. By enhancing business operations, decision-making processes, and customer interactions, AI is providing companies with competitive advantage and boosting financial performance in green waste management. The integration of AI into financial services, especially through EmFi, enables firms to optimize resource allocation, forecast market trends, and innovate more efficiently. Our research highlights the junction between Embedded Finance and Green Waste Management initiatives via AI during Bharat's BRICS economic trajectory. It further provides practical recommendations for companies to navigate this evolving landscape, emphasizing the importance of AI literacy, innovation, and strong governance structures to manage both risks and opportunities effectively for Viksit Bharat (Developed Nation).

Keywords:

Green Technology, Machine learning, Waste Management, Embedded Finance (EmFi), Artificial Intelligence, Environmental Sustainability.

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1. Introduction

India is moving toward becoming a developed country by 2047, a goal embodied in the phrase "Viksit Bharat." Even while BRICS has played a significant role in influencing emerging nations' access to global finance, India's growth trajectory going forward needs to increasingly center on sustainable and creative approaches. AI-driven financial strategies and green management are two important components that can further induce economic growth of Viksit Bharat by utilizing recycled green waste in collaboration with the BRICS community. In today's rapidly evolving profitable landscape, technological innovations and sustainability goals are key drivers of corporate strategy and national growth. Embedded Finance is transforming the way businesses and consumers engage with financial services, from mobile banking and investments to cryptocurrency. Artificial Intelligence (AI) emerges as a game-changing tool, enabling companies to enhance decision-making, streamline operations, and improve customer engagement. This convergence of Fintech and AI is creating new paradigms for businesses, particularly in the BRICS nations (Brazil, Russia, India, China, and South Africa), where economic growth is intertwined with technological progress and environmental sustainability. India and other developing nations now have a forum to oppose the global financial institutions' hegemony and shape international economic policy thanks to the BRICSalliance. But India's economic strategy needs to adjust in the post-BRICS world, where sustainability, technological innovation, and climate change are vital successfactors. India is positioned to take advantage of these trends to further its own development as the world's economic policies are being reshaped by the increasing emphasis on environmental stewardship and the rapid advancement of artificial intelligence (AI) as shown in (see Fig.1) For the BRICS nations—emerging economies with significant roles in the global marketplace—the synergy between Fintech, AI, and green management offers a compelling pathway to sustainable and inclusive development. These countries areat a critical juncture where the adoption of advanced technologies can accelerate economic progress while addressing environmental challenges. India’sambitious vision of "Viksit Bharat" (a developed India) hinges on integrating cutting-edge technologies like AI in various sectors, especially financial services, to foster innovation, enhance operational efficiency, and ensure that growth aligns withlong-term environmental objectives.

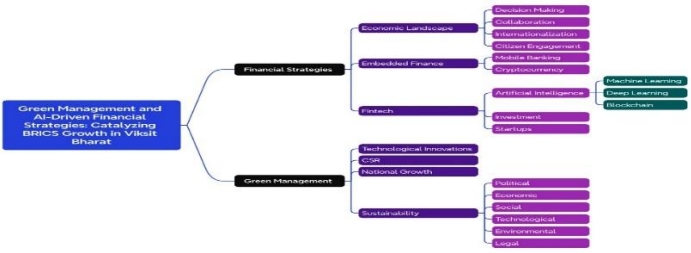

Fig. 1. A Figure Mind Map showing the flow of the research study.
Source Author’ self-made

The rising industrialization and urbanization of the world provide environmental issues that must be addressed in large part through green management. It entails implementing sustainable practices in all sectors of the economy, emphasizing the use of renewable energy sources, resource efficiency, and carbon emission reduction. India's future development must be based on environmental responsibility because the nation is confronted with escalating environmental problems, such as deforestation and pollution of the air and water. In addition to assisting in the mitigation of these problems, integrating green management into its development plan would open new prospects in industries like waste management, clean energy, and agriculture. This strategy places India as a leader in the green economyand is consistent with international efforts to address climate change. AI-driven financial strategies, meanwhile, provide a way to achieve more astute and effective economic management. By improving decision-making, boosting predictive capacities, and spotting market opportunities, artificial intelligence (AI) technologies are transforming entire sectors. AI has the potential to enhance risk management inIndia's financial industry, facilitate better capital access, and promote sustainable investing strategies. Furthermore, by ensuring that economic growth is in line with environmental objectives, AI-powered solutions can assist in more efficiently allocating resources toward green activities. However, the technological transformation within the financial sector does not exist inisolation. As environmental concerns rise to the forefront of global discourse, the integration of AI with green management practices is essential for driving sustainabledevelopment. Green management refers to the practices that prioritize sustainability and environmental responsibility in business operations. By combining AI's potential to drive financial innovations with green management principles, businesses can not only achieve economic growth but also contribute to global efforts to combat climate change, reduce carbon footprints, and conserve natural resources. Integration of AI with green management practices is essential for driving sustainable development. Green management refers to the practices that prioritize sustainability and environmental responsibility in business operations. By combining AI's potential to drive financial innovations with green management principles, businesses can not only achieve economic growth but also contribute to global efforts to combat climate change, reduce carbon footprints, and conserve natural resources. The current study suggests the integration of finance and green waste using AI and Machine Learning, allowing the advent of digital money transactions in green waste management.

By anticipating financial gains and profits for recycled waste products and balancing ecosystem and analyzing the data for Em-Fi and its array of applications for green industries. Through these insights, the study will contribute to understanding how technology can support a balanced approach to economic growth, environmental stewardship, and societal well-being, laying the groundwork for a sustainable, technology-drivenfuture in the BRICS nations and beyond. India can accomplish its "Viksit Bharat" goals and create a sustainable, inclusive, and progressive development model for the post-BRICS era by fusing green management with AI-driven finance methods shown in (see Fig. 2)

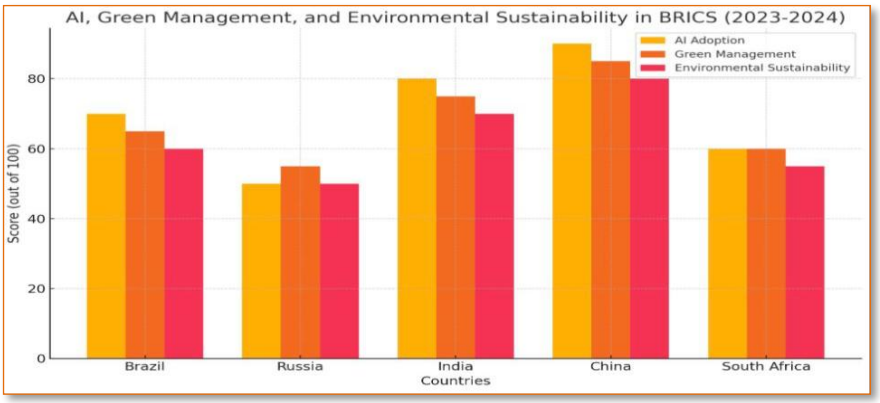

Fig 2. A Figure Showing Environmental sustainability of AI e-waste of different BRICS countries. Source: Author self-made

2. Literature Review:

The evolution of sustainability in global business has been shaped by increasing awareness of environmental, social, and governance (ESG) factors, driven by both consumer demand and regulatory pressures. Initially, sustainability was viewed primarily as a corporate social responsibility (CSR) initiative, where businesses aimed to minimize harm to the environment while fulfilling their social obligations (Elkington, 1999). Over time, sustainability evolved into a core strategic objective for companies, integrating green management principles into supply chains, operations, and long-term planning to enhance both economic performance and environmental stewardship (Wu, 2011) In the BRICS context, sustainability has become especially critical due to the region's unique economic and environmental challenges. Rapid industrialization in Brazil, Russia, India, China, and South Africa has led to significant environmental degradation, prompting governments and corporations to adopt green management practices. These practices, which include sustainable resource management, renewable energy adoption, and waste reduction strategies, have become essential for balancing economic growth with environmental conservation (Li, 2020). BRICS countries recognize that green management is not just about compliance but also a pathway to competitive advantage in the global market. In its research, (Bawa, 2024) the Shakti Sustainable Energy Foundation highlights how renewable energy, legislative changes, and environmentally friendly funding options may help India achieve its objective of net-zero emissions while still promoting economic growth. Considerable progress has been made in the nation's use of renewable energy, especially solar and wind power. India is investigating a variety of strategies, including technology innovation, nature-based solutions, and green jobs, to maintain this. Promote sustainable development, the paper emphasizes the necessity of strong governance and funding structures, institutional capacity building, and

sectoral initiatives. Another study (van Niekerk, 2024) examines the connection between the Sustainable Development Goals (SDGs), the depletion of natural resources, and economic marginalization, with a particular emphasis on green financing as a potential remedy. It highlights how green finance may encourage sustainable investment and help usher in a circular economy by providing incentives for people to make economic inclusion. Finding a substantial correlation between green finance and economic inclusion, the study suggests that green finance can expedite the achievement of the SDGs by drawing in investors and facilitating widespread, environmentally conscious benefits. The study concludes that inclusive, sustainable growth requires green financing. AI in Financial Strategies: This article (Deloitte, 2024) explores how artificial intelligence (AI) is transforming the financial services sector through increased operational effectiveness, better decision-making, and targeted client experiences. Financial organizations may save costs, better manage compliance, and provide more specialized services with the incorporation of AI.

Artificial intelligence (AI) is transforming financial systems by optimizing processes, improving decision-making, and driving innovation in green finance. AI's ability to analyse vast amounts of data in real time has revolutionized risk management, allowing financial institutions to better predict market trends, assess credit risk, and manage portfolios (Liang, 2020). This has led to greater efficiency in financial operations and more accurate forecasting, essential for dynamic and unpredictable markets. In addition to improving operational efficiency. AI plays a crucial role in enabling green finance. AI-powered algorithms help identify and support sustainable investments, such as green bonds and environmentally responsible projects. (Dastin, 2017). For example, in the BRICS countries, where environmental challenges are profound, AI-driven financial strategies are pivotal for mobilizing capital toward sustainable development initiatives (Filatova, 2021). BRICS Growth Strategies: The economic models of BRICS countries reflect a balance between rapid industrialization and the growing imperative for sustainable development. However, the shift towards sustainable economic growth has seen BRICS countries adopt green practices in response to both domestic and international pressures. China, for instance, has become a leader in renewable energy production, with massive investments in solar and wind energy (Li, 2020) Brazil is leveraging its vast natural resources for sustainable agriculture and bioenergy. Meanwhile, India has emphasized sustainable urbanization and renewable energy projects to meet its development goals without exacerbating environmental issues (Kumar, 2022). While each BRICS country faces unique sustainability challenges, the adoption of green management practices and AI-driven financial strategies is contributing to more balanced, resilient economic models. By integrating sustainable development goals (SDGs) into national policies and corporate strategies, BRICS countries are positioning themselves as leaders in the global green economy (Filatova, 2021) India’s Roadmap to Viksit Bharat: India’s vision for *Viksit Bharat* (Developed India) focuses on leveraging AI and green management to achieve sustainable and inclusive growth. The government’s policies, such as the National AI Strategy and the Green India Mission, aim to promote technological innovation and environmental sustainability in tandem (Kumar, 2022). These strategies include the adoption of AI for improving energy efficiency, optimizing water usage in agriculture, and supporting the development of smart cities that are both environmentally friendly

and economically viable. In the financial sector, India is utilizing AI to enhance green finance mechanisms, such as green bonds and sustainability-linked loans, which are pivotal for funding large-scale infrastructure and renewable energy projects (Liang, 2020). By integrating AI-driven financial strategies with green management practices, India is building a foundation for long-term sustainable development that aligns with its broader economic objectives. Furthermore, India's focus on inclusive growth ensures that the benefits of sustainability and AI are distributed across all sectors of society, from rural farmers to urban entrepreneurs. Initiatives like the *Viksit Bharat* program not only aim to elevate India's economic standing globally but also to ensure that growth is environmentally responsible and socially equitable (Kumar & Bansal, 2022). In this way, India is setting a benchmark for how emerging economies can achieve development while remaining committed to sustainability and green innovation. In their NCAER Working Paper, Sourya Mohapatra and Sanjib Pohit ((NCAER), 2024) assess India's economic system, paying special attention to its investment and trade policies. It evaluates the potential brought about by global economic integration as well as the existing difficulties, such as the complexity of regulatory frameworks. The paper offers insights into how domestic policy reforms might improve India's competitiveness, particularly in areas driven by technology. It highlights the necessity of strategic planning to maximize India's potential in the global market by harmonizing with international norms and enhancing ease of doing business. The goals of Green India and Clean India are the preservation of the environment and cleanliness. Green India: This section of the National Action Plan on Climate Change emphasizes sustainable ecosystem management and afforestation. The objectives are to improve biodiversity, expand the amount of forest cover, and lessen the effects of climate change. Clean India (Swachh Bharat): This initiative was started to encourage waste management, sanitation, and cleanliness throughout the nation. Its goals include eradicating open defecation, enhancing hygiene, and making both urban and rural areas cleaner. Together, they want to create an environmentally friendly and sustainable future for India.

3. Research Methodology

The methodology used by this paper is ML (XG boost). The primary data and secondary data are used. The data set is from January 2020 to January 2024. A pre-processing data is generated by applying a Pearson coefficient correlation. The primary data is taken through 200 respondents. The secondary data is taken from the links mentioned Kaggle: https://www.kaggle.com/ ,Govt of India: https://www.india.gov.in/

This model has taken 80% trained data and 20% test data. The XG boost model of classification is applied by using the parameters are the usage of e-waste-embedded AI by various companies and the other parameters of different countries. The model has generated various graphs given below as an analytical prediction. The same ML technique (boost) is applied to two parameters: first e-financial products and different countries. The graphs generated are below Graph 1 and Graph 2. A confusion matrix is generated by ensemble the both the results generated of Graph 1 and Graph 2 and shown in Graph 3 of two parameters (a) AI embedded E- waste (b) Its impact on financial growth in BRICS countries. To refer the machine learning technique the link is provided:
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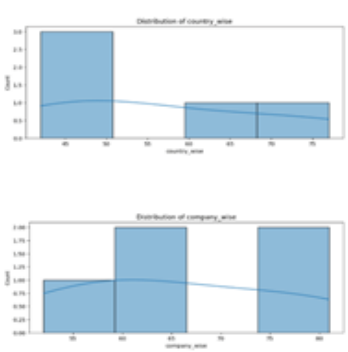
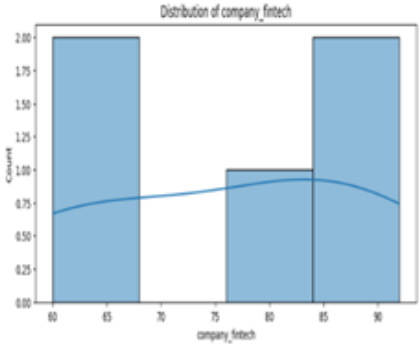


Graph 1 represents XG boost using E-waste



Graph 2 represents XG boost technique Embedded with AI in BRICS countries. on financial impact of E-waste on BRICS countries

Fig.3 A Figure Represents XG boost using E-waste
and Represents XG boost techniques embedded with AI in BRICS countries on financial impacts of E-waste on BRICS countries

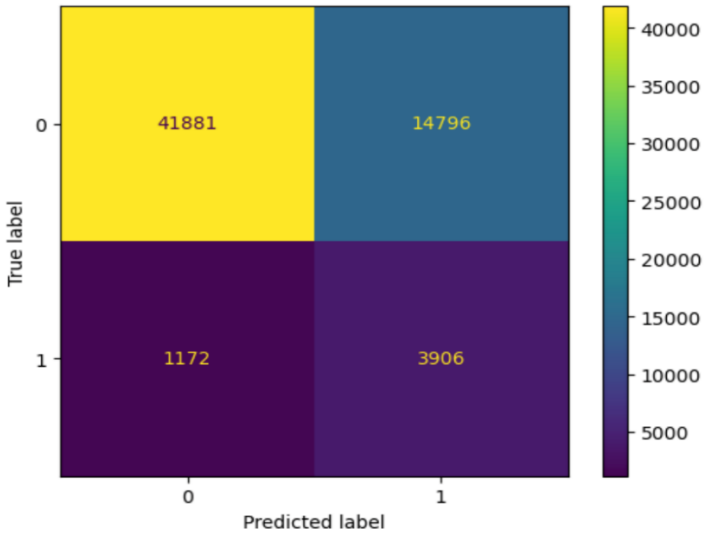


Fig.4 A Figure reflects Ensemble matrix generated by combining E- waste and monetary impact on different BRICS countries.

Table 1: Table Represents Classification Report

Precision	**recall**	**F1-score**	**variance**	**support**
0	0.97	0.74	0.84	56677
1	0.21	0.77	0.33	5078
Accuracy			0.74	61755
Macro-average	0.59	0.75	0.58	61755
Weighted Average	0.91	0.74	0.80	61755

3.1 Precision: Out of all the instances that the model predicted as positive, how many are positive. A precision score of 0.97 for class 0 means that 97% of the instances that the model predicted as class 0 are class 0. Similarly, a precision score of 0.21 for class 1 means that only 21% of the instances that the model predicted as class 1 are class 1.

3.2 Recall: Out of all the actual positive instances, how many of the model correctly identified. A recall score of 0.74 for class 0 means that the model correctly identified 74% of all actual class 0 instances. Similarly, a recall score of 0.77 for class 1 means

that the model correctly identified 77% of all actual class 1 instances.

3.3 Accuracy: The ratio of correct predictions to total predictions. An accuracy of 0.74 means that the model correctly predicted the class for 74% of all instances.

4. Data Analysis

The investment trends and market growth show both are directly related proportional to Global Green Technology and by 2030 the projection is it will reach US Trillions. There is growing popularity in various corporates as there is a provision of time loan terms of government scaling commercialization.

5. Findings & Discussion

The Triple Bottom Line (TBL) Theory is a potent paradigm that combines social responsibility, environmental sustainability, and economic performance. It is in perfect alignment with the main goals of –

- The environmental component of green management
- AI-Powered Financial Strategy (Technological and Economic Foundations)
- Financial-environmental integration, or Em-Fi (Environmental Finance)
- Viksit Bharat (the pillar of social and developmental effect) and BRICS Growth.

This theory aids in assessing how financial innovation and artificial intelligence (AI) improve human happiness and the health of the planet in addition to profitability, which is crucial for sustainable growth in developing nations like India and the BRICS. Proposed by John Elkington in 1994, the Triple Bottom Line (TBL) Theory provides a thorough and multifaceted framework that assesses organizational and policy success using the integrated lenses of People (Social Responsibility), Planet (Environmental Stewardship), and Profit (Economic Viability) rather than just economic performance. This makes it especially appropriate for researching intricate, interdisciplinary topics such as AI-Driven Financial Strategies and Green Management in BRICS nations, particularly in the context of Viksit Bharat 2047.

Table 2: Table Represents Comparison Table on Different Attributes

Attributes	Very Good	Good	Average	Fair	Poor
Financial Technology Usage	AI Technology Usage	Green Waste Management	AI Influence	Sustainability	E-Waste Management
Usage of E-Financial Products	E-Waste Management	Usage of AI, AI Influence on Customers	Sustainability	Investment in Financial Technologies	-
Investment in E-Financial Products	Usage of AI	Sustainability	Green Waste Management	AI Influence on Customers	-
Customer Experience	Usage of AI and E-Financial Products	Sustainability	Green Waste Management	AI Influence on Customers	Investment on E-Financial Products

6. Conclusion

The BRICS countries, particularly India, has a revolutionary potential as they negotiate the challenging path toward sustainable and inclusive growth through the integration of green management and AI-driven finance strategies. As embedded finance (EmFi) is changing financial services and digital ecosystems across industries, this study emphasizes the crucial role. AI plays in maximizing resources, improving decision-making, and facilitating innovations in EmFi. Through the integration of green waste management and environmental stewardship with these technologies, the BRICS countries can effectively tackle world environmental issues. The "Viksit Bharat" vision for India, which aims to make the country developed by 2047, depends on taking a balanced strategy that blends technological innovation with sustainable objectives. India's growth strategy in the BRICS, world needs to be innovative, with strong governance frameworks and AI literacy to effectively manage the benefits and threats brought about by these rapidly developing technologies. This will also set a new precedent for how developing nations can flourish and preserve the environment for the coming generations in future.

Both Green Technology & Green Finance are comparatively new fields, thus data sets are available only from 2020 onwards. There is no universal standard for defining green and sustainable finance. Some tech company’s financial institutions might not release their complete data sets.

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