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Carbon Accountability and Growing Entrepreneurship in India: Challenges and Opportunities

Carbon Accountability and Growing Entrepreneurship

Dr. Pragya Khanna
Principal, Girdhari Lal Dogra Memorial Govt. Degree College,
Hiranagar-184142 (Dist. Kathua), J&K, India.

Corresponding Author:
Dr. Pragya Khanna
Ph.D., D.Litt. MNASc, FSLSc., FIASc., FESW
Principal, Girdhari Lal Dogra Memorial Govt. Degree College, Hiranagar-184142 (Dist. Kathua), J&K, India.
Address for Correspondence:
Harbans Cottage
H.No. 79, Sec. 3, Lane 1
Nanak Nagar, Jammu-180 001, J&K, India

Abstract:- India, a rapidly growing economy, is at a critical juncture where the balance between economic growth and environmental sustainability is more important than ever. As entrepreneurship flourishes across the nation, there is an increasing need to integrate carbon accountability into business practices. This paper explores the relationship between carbon accountability and the growing entrepreneurial landscape in India, analyzing the challenges, opportunities, and the role of policy in promoting sustainable business practices. The study argues that fostering carbon accountability among entrepreneurs is essential for long-term economic and environmental sustainability.

I. INTRODUCTION

India's entrepreneurial ecosystem has experienced significant growth over the past decade, driven by a combination of economic liberalization, technological advancements, and a young, dynamic population (Jha, 2018). However, as businesses proliferate, so do their carbon footprints, raising concerns about the environmental impact of this growth. Carbon accountability, which involves measuring, managing, and reducing carbon emissions, is becoming a critical component of sustainable business practices (Schaltegger & Csutora, 2012).

Entrepreneurship development in India took off in the early 2000s and has been a transformative force for the nation's economy. This momentum has been fueled by the growth of the Indian economy, increased access to venture capital, the advent of incubators, and a vast reservoir of talent. India is ranked fourth out of 51 countries in terms of the quality of its entrepreneurship ecosystem according to the Global Entrepreneurship Monitor (GEM) National Entrepreneurship Context Index (NECI)**.** This score has significantly improved from its 2021 position, where India was ranked 16th. India has emerged as a global epicentre for the start-up landscape, securing the third position with over 90,000 start-ups and 107 unicorn firms valued at $30 billion**,** following only the United States and China, as published by Mint (2023).

Carbon accounting and auditing empower organizations to take responsibility for their environmental impact. By accurately measuring and reporting greenhouse gas (GHG) emissions, companies can identify key areas where they can reduce their carbon footprint (Stefanie Lewandowski & André Ullrich, 2023). This not only helps in achieving sustainability goals but also enhances corporate reputation, as stakeholders increasingly demand transparency and accountability in environmental practices.

Governments around the world are enacting stringent regulations to curb GHG emissions (Saima Mehmood et al., 2024). Carbon accounting provides the necessary data to ensure that organizations comply with these regulations, while carbon auditing ensures the accuracy and reliability of the reported data. Compliance with climate policies is crucial for avoiding penalties, maintaining operational licenses, and contributing to national and international climate targets (Chateau et al., 2023).

This paper examines the intersection of carbon accountability and entrepreneurship in India, focusing on the challenges and opportunities that lie ahead.

II. THE STATE OF ENTREPRENEURSHIP IN INDIA

India has emerged as a global hub for entrepreneurship, with a diverse range of start-ups spanning various sectors, including technology, healthcare, agriculture, and manufacturing (Abdul Kareem & Govindharaj, 2024). The government's initiatives, such as Start-up India and Make in India, have further fuelled this growth by providing financial

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support, ease of doing business, and tax incentives (Anurag & Abhinav, 2023). Streamlined regulations, tax exemptions, and intellectual property rights protection have also been enacted to create a conducive ecosystem for start-up development. Additionally, various ministries and state governments run funding, incubation, and mentorship programs to support small start-ups (DBT, DST, DRDO).

A. Growth Drivers

Factors contributing to the entrepreneurial boom include a large domestic market, increasing internet penetration, and access to capital from domestic and international investors (Anurag & Abhinav, 2023).

B. Challenges

Despite the growth, entrepreneurs face challenges such as inadequate infrastructure, regulatory hurdles, and limited access to global markets. Environmental sustainability, particularly carbon accountability, is often overlooked in the pursuit of rapid growth (Santander, P. et al., 2022)..

III. CARBON ACCOUNTABILITY: DEFINITION AND IMPORTANCE

Carbon accountability refers to the responsibility of organizations to measure, report, and reduce their carbon emissions. It involves a systematic approach to understanding the environmental impact of business activities and implementing strategies to mitigate these effects.

A. Measurement and Reporting

Accurate measurement of carbon emissions is the first step towards accountability. This includes direct emissions from company operations (Scope 1), indirect emissions from energy consumption (Scope 2), and emissions from the supply chain (Scope 3) (Kiswanto et al., 2023).

B. Mitigation Strategies

Businesses can reduce their carbon footprint through energy efficiency, adoption of renewable energy, sustainable sourcing, and carbon offsetting initiatives (Ghosh, P et al., 2020).

C. Regulatory Landscape

The Indian government has introduced policies such as the Perform, Achieve, and Trade (PAT) scheme and the Carbon Tax on coal to encourage industries to reduce their carbon emissions (PAT Report, Bureau of Energy Efficiency, GOI, Ministry of Power, 2012-13, 2014-15) . However, the enforcement of these policies among small and medium enterprises (SMEs) remains weak.

As carbon accounting and auditing become standard practices, they foster a culture of continuous improvement in environmental performance. Organizations are encouraged to regularly assess and refine their strategies, ensuring ongoing progress toward reducing emissions. This culture of accountability is crucial for achieving long-term sustainability goals and maintaining the momentum needed to combat climate change effectively.

IV. THE INTERSECTION OF CARBON ACCOUNTABILITY AND ENTREPRENEURSHIP

The growing entrepreneurial landscape in India presents both challenges and opportunities for integrating carbon accountability.

A. Challenges for Entrepreneurs

Many start-ups operate with limited resources and are primarily focused on survival and growth, often at the expense of environmental considerations. The lack of awareness and expertise in carbon management further complicates the integration of carbon accountability into business practices (Bhaskar et al., 2022).

B. Opportunities for Sustainable Entrepreneurship

Entrepreneurs who adopt sustainable practices can differentiate themselves in the market, attracting eco-conscious consumers and investors. Green start-ups, particularly in sectors such as clean energy, waste management, and sustainable agriculture, are poised to lead the way in carbon accountability (Sarvesh Kumar et al., 2023).

C. The Role of Technology

Technology plays a crucial role in enabling carbon accountability (Stefan Schaltegger & Maria Csutora, 2012). Innovations in data analytics, blockchain, and the Internet of Things (IoT) can help start-ups track and reduce their carbon emissions more efficiently (Wang, Michael, 2020).

V. CASE STUDIES

This section explores specific case studies of Indian start-ups that have successfully integrated carbon accountability into their business models.

A. ReNew Power

(Ranjitha Shivaram, 2020): As one of India's leading renewable energy companies, ReNew Power has made significant strides in reducing carbon emissions by providing clean energy solutions. With the increase in renewable generation and the continued reliance on coal, India’s power sector grapples with creating a more responsive, flexible, and resilient system. As private companies deploy more renewable energy, especially solar and wind generation, clean energy finance has begun to take centre stage.

From the demand side, India’s energy demand will only continue to increase as this populous economy of 1.36 billion people grows and modernizes. This makes an energy transition focused on a reliable, clean, and affordable supply of energy critical to not only India’s economic development, but also to the global economy and the environment.

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B. Ecozen Solutions:

A star-tup focused on sustainable agriculture, Ecozen has developed solar-powered cold storage units, reducing the carbon footprint of the agricultural supply chain.

It focuses on developing technology-enabled products to strengthen the farm-to-fork value chain of perishables, with a focus on renewable energy and sustainable development.Till now, Ecozen has developed two products so far: a) Ecofrost, is a device that acts as a portable cold room that maintains a low temperature. It works on solar power and b) Ecotron, a pump controller for irrigation that also works on solar power.According to the company, approximately 20,000 farmers in India have used their products (Kishor P. Bholane, 2023).

C. Log 9 Materials

(Srinivasan & Supraja, 2017): A Bengaluru-based start-up, Log 9 Materials, is working on sustainable battery technologies that promise to reduce emissions in the electric vehicle (EV) sector. With 16 patents around Graphene, Log9 Materials has developed Aluminium–air battery, aluminium fuel cells for both mobility and stationary energy applications. Log9 was awarded "Most Innovative Technology Company of 2018" by the Department of Science and Technology (India), Government of India. (www.log9materials.com).

VI. POLICY RECOMMENDATIONS

To promote carbon accountability among entrepreneurs, the following policy recommendations are proposed: (Cojoianu et al.; 2020; Xiangmin & Jianhua, 2024)

A. Incentivizing Sustainable Practices

The government should provide tax incentives, grants, and subsidies for start-ups that adopt sustainable practices and reduce their carbon footprint. According to experts as reported by 'The Economic Times' (English Edition) on May 14, 2024 "Providing financial incentives, such as tax breaks, and subsidies, for companies that invest in sustainable technologies and practices can help accelerate the adoption of green manufacturing practices".

B. Strengthening Regulatory Frameworks

Existing regulations on carbon emissions need to be enforced more stringently, particularly for SMEs. The government should also consider introducing mandatory carbon reporting for all businesses. (EcoHedge, 2023).

C. Promoting Education and Awareness

Initiatives to educate entrepreneurs about the importance of carbon accountability and the tools available for carbon management should be prioritized (Oliver et al., 2018).

D. Encouraging Collaboration

The government, private sector, and civil society should work together to create platforms for sharing best practices in carbon accountability and sustainability (Oliwia, 2024).

VII. CONCLUSION

As India continues its journey towards becoming a global economic powerhouse, it is imperative that the entrepreneurial ecosystem evolves in a way that prioritizes environmental sustainability. Carbon accountability should not be seen as a burden but as an opportunity for innovation and differentiation. By embracing sustainable practices, Indian entrepreneurs can not only contribute to the fight against climate change but also position themselves as leaders in the global market. The integration of carbon accountability into the entrepreneurial landscape is essential for ensuring long-term economic growth and environmental preservation in India.

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