Chapter 9
Green FinTech Innovations:
Empowering Inclusive Development and Advancing Towards the Sustainable Economy

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ABSTRACT

Green FinTech is the intersection of financial innovation and environmental sustainability, helping solve two of the most important challenges of our time: climate change and economic inequality. Using blockchain, AI, IoT, and mobile platform, it facilitates green investments, carbon credit trading and widely access to green finance. Green FinTech enables marginalised communities via microloans, pay-as-you-go solar systems and decentralized energy markets, perfectly aligning with UN SDGs (7, 9, 10, 13). It pays off globally too as seen in the case studies from Kenya

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(M-Pesa green bonds) to Bangladesh (IDCOL solar programs) and Brazil (Pix carbon trading). Yet, regulatory gaps, risk of greenwashing and the digital divide pose challenges to its scalability. The chapter suggests aligned ESG standards, PSPs, and energy-efficient technologies to help address the problem. Green FinTech provides a roadmap to equitable climate resilience and economic growth by connecting technology and policy with inclusion in the finance.

1. INTRODUCTION

Technological development has revolutionized global economies, reshaping industries, financial systems, and consumer behavior (Sima et al., 2020; Salam et al., 2024). Rapid developments in artificial intelligence (AI), blockchain, big data, cloud computing and the Internet of Things (IoT), have further sped up digital transformation and opened up more avenues as it facilitates efficiency, transparency and accessibility across the sectors (Chauhan & Sahoo, 2024). Such innovations have naturally led to an evolution in financial Services by unlocking innovations like digital payments, Decentralized Finance (DeFi), robo-advisors, and automated risk assessment using AI (Onabowale, 2024; Rayun et al., 2025). An extraordinary convergence of financial markets and technological advancements has opened up previously unimaginable avenues for addressing some of the world's most critical problems. FinTech refers to the adoption of current technology (AI, IoT, and more) within the financial sector in order to automate supply chains and provide business-to-consumer financial services throughout the world (Mirza et al., 2023). Even while technology is always changing, it must be used to address the most pressing global problems, such as financial inequality and climate change. One of the greatest intersections of technological innovation and sustainability is the rise of Green FinTech where a new paradigm that marries financial technology with sustainability and impact principles (Ashrafi & Akhter, 2025). As a force combining both environmentally sustainable and financial technology, Green FinTech emerges as an innovative front end to sustainable development and financial inclusion (Aboalsamh et al., 2023). It's becoming more clear that FinTech could help bring about good change, especially since climate change is getting worse and economic inequality is still high (Singh, 2022).

Green FinTech solutions facilitate eco-friendly financial practices such as carbon credit trading, green investments, and sustainable banking (Nassiry, 2018). Technologies like AI, blockchain, and big data analytics help institutions assess and mitigate climate-related risks, enabling climate-conscious financial decisions (Fu et al., 2024). Green FinTech aims to enable access to sustainable finance for everyone, most especially for low-income populations, small businesses, and un-