Chapter 5
Climate Risk, Commodity Prices, and Sectoral Dynamics in Indian Financial Markets:
A Systematic Literature Review

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ABSTRACT

According to the authors, this chapter provides a comprehensive review of more than the last twenty years empirical research on the relationship between commodity prices, sectoral stock indices and climate change induced financial risk in India. The chapter discusses the historical evolution of analytical techniques from simple linear econometric analysis to more recent machine learning algorithms by integrat-

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ing 67 articles published in peer-reviewed journals between 2000 and 2025 using the PRISMA methodology. Key thematic results are large transmission effects of volatility between commodities and from these to sectoral markets, varying sectoral sensitivities to climate stress, and new trends in fintech and ESG commodity trading. Issues in climate risk integration, data innovation and policy frameworks are highlighted in the chapter. It provides a sound basis for climate-friendly financial strategies to help develop more resilient and sustainable capital markets in India.

INTRODUCTION

This systematic review analyzes over twenty years of research on commodity prices and sectoral indices in India, emphasizing climate-related financial risks. It traces the evolution of analytical methods from linear models to hybrid machine learning approaches and highlights emerging themes, including volatility spillovers, behavioral finance, and the shift toward fintech-enabled markets. The review identifies gaps and proposes a forward-looking agenda to integrate climate risk into sectoral financial analysis, offering insights for investors, policymakers, and market participants to foster resilient and adaptive markets.

India's high climate vulnerability exposes commodity-sensitive sectors—such as agriculture, energy, metals, and infrastructure—to significant risks, which are crucial for GDP and employment. Climate change drives volatility through physical channels, like extreme weather affecting production and logistics, and transitional channels, such as regulatory shifts and decarbonization policies. These climate-induced risks impact commodity prices, which in turn influence sectoral stock returns through complex cost structures and demand changes. Yet, studies on Indian financial markets have predominantly focused on traditional economic drivers, leaving blind spots in risk assessment, portfolio management, and policy planning.

In response, India has begun aligning financial policies with sustainable finance objectives, including RBI climate risk disclosures, priority lending for renewables, and the Climate Risk Information System (RB-CRIS). Concurrently, ESG-linked financial instruments and green commodities, such as lithium and carbon credits, are increasingly incorporated into conventional markets. Synthesizing evidence on climate risks, commodity prices, and sectoral financial markets using econometric and machine learning methods, along with novel datasets like satellite imagery and social media sentiment, provides a robust foundation for climate-aware financial strategies that support India's sustainable development goals.

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