Ai-Driven Green Strategic Investment Decision-making and Capital Allocation: A Systematic Review

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Abstract:
Artificial intelligence is increasingly shaping financial decision making in sustainable finance and climate investment. Investors, financial institutions, and corporate managers are now using artificial intelligence tools to analyze environmental data, evaluate climate related risks, and guide capital allocation toward green projects. However, despite the growing importance of artificial intelligence in financial markets, research on its role in green strategic investment decision making remains fragmented across finance, sustainability, and information systems literature. This study presents a systematic review of academic research examining how artificial intelligence influences green investment decisions and capital allocation. Guided by the PRISMA systematic review framework, the study synthesizes peer reviewed literature indexed in Google Scholar and major academic databases. The objective is to identify the mechanisms through which artificial intelligence improves environmental data processing, climate risk assessment, and sustainable investment strategies. The review finds that artificial intelligence contributes to green investment decision making by improving the analysis of sustainability information, strengthening ESG evaluation models, and supporting strategic allocation of financial resources toward environmentally responsible firms and projects. Artificial intelligence tools also enable investors to identify climate related risks more effectively and incorporate sustainability metrics into portfolio management. However, the literature also identifies governance challenges related to algorithm transparency, data bias, and regulatory oversight. Without appropriate governance frameworks, artificial intelligence systems may reinforce information asymmetries or create new risks in financial markets. The study concludes that artificial intelligence can significantly improve sustainable investment outcomes when supported by reliable environmental data, strong institutional governance, and transparent financial regulations.

Keywords:
Artificial intelligence, green finance, sustainable investment, ESG investing.