Harnessing Artificial Intelligence and Machine Learning for Enhanced Agricultural Practices: A Pathway to Strengthen Food Security and Resilience

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Abstract

The global population is expected to exceed nine billion by 2050, necessitating at least a 70% increase in agricultural output to meet the demands of this growth. It is anticipated that only about 10% of this increase will come from newly developed areas, with the majority—90%—arising from enhanced productivity in existing agricultural practices. Addressing this challenge requires leveraging the latest advancements in technology to maximize agricultural efficiency. This research focuses on assessing the role of artificial intelligence (AI) and machine learning (ML) in enhancing food security and resilience, especially in developing economies. The study explains how AI and ML contribute to food security and resilience, offering practical recommendations for emerging markets to harness these technologies. The chapter concludes with an exploration of the impact of various AI and ML-driven technologies on food security.