



Leveraging Artificial Intelligence (AI) for Precision Agriculture to Enhance Food Security

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Introduction

Agriculture is vital in the global economy, supplying food and raw materials to support the increasing population worldwide. It is also crucial for sustaining human existence, increasing food availability, and facilitating food security. However, with the added challenges of dwindling water resources, shifting climate patterns, and the loss of agricultural land, there is an urgent need for innovative solutions to boost farm productivity and efficiency. Among the most promising of these solutions is Artificial Intelligence (AI), which has the potential to revolutionise agricultural practices worldwide. The study explored AI for precision agriculture in enhancing food security. It specifically investigated the role of AI technologies, including machine learning and computer vision, for precision agriculture to ensure food security.

Methodology

Secondary data from journals and articles across major databases, including Web of Science, Scopus, Springer and Google Scholar, was utilised for the study. These platforms were chosen for their comprehensive coverage of peer-reviewed articles and conference proceedings. Content analysis using a systematic approach was employed to analyse the collected data.

Results and discussion

The study is significant in the realm of intelligent soil and crop monitoring through the integration of machine learning and computer vision. It found the precise analysis of soil nutrient levels, real-time monitoring of soil moisture, accurate tracking of plant growth, early detection of diseases and pests, and reliable predictions of crop yields. The study's findings revealed that integrating AI technologies, machine learning, and computer vision into precision agriculture promotes high crop yields, thereby enhancing food security.

Conclusion

The study investigated the role of AI technologies, machine learning, and computer vision in precision agriculture in enhancing food security. It found that integrating these AI technologies into precision agriculture promotes high crop yields, thereby enhancing food security. The study concluded that machine learning and computer vision have significant effects on precision agriculture. It is therefore recommended that the AI technologies be leveraged for precision agriculture in Nigeria.

Keywords

Artificial Intelligence, Precision Agriculture, Food Security, Machine Learning, Computer Vision.