Chapter 3
AI-Powered IoT (AI IoT) for Decision-Making in Smart Agriculture: KSK Approach for Smart Agriculture

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ABSTRACT

Smart farming using AI-driven IoT is revolutionising the agriculture sector, increasing its profitability, sustainability, and efficiency. Farmers may automate processes, make data-driven choices, and encourage sustainable practices by utilising cutting-edge technologies. In order to meet the increasing demand for food, smart farming must embrace AI-driven IoT, as the world's population is predicted to exceed 9.7 billion by 2050. We can confidently state that this technology represents the direction of agriculture and will be crucial in providing food for the world's population in the years to come. The agricultural business could undergo a significant transformation because to AI-powered IoT. Farming is becoming more profitable, sustainable, and efficient as a result of utilising data and sophisticated technology. All farmers, regardless of the size of their enterprises, must have access to and a reasonable price for this technology, though. AI-driven IoT can revolutionise food production and guarantee food security for future generations if it is implemented and integrated properly. IoT powered by AI has the power to completely transform the agriculture sector. Farmers can enhance decision-making, efficiency, and yields while lessening their environmental impact by leveraging the power of data, AI, and IoT. To create a more productive and sustainable agricultural future, it is imperative that

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organisations, governments, and farmers work together and adopt this technology. The proposed KSK approach is nothing but the decisions making by means of IoT powered by AI. The proposed system is more accurate due to use of AI algorithms.

INTRODUCTION

Precision agriculture, or smart agriculture, is the application of cutting-edge tools and methods to increase the yield and efficiency of farming operations. This cutting-edge farming method is quickly gaining traction because it has many advantages, including higher agricultural yields, less resource waste, and enhanced sustainability by Wale (2019). AI, which stands for artificial intelligence, is the process of imitating human intelligence in machines by programming them to think and behave in a manner that is similar to that of humans. The ability to learn and find solutions to problems, as well as the capacity to comprehend and process language, recognise patterns, and make decisions based on evidence, are all included in this.

By 2050, it is expected that there will be nine billion people on the planet, placing tremendous strain on the world's food supply. The agriculture industry must become more intelligent and productive in order to meet this demand. This is where smart agriculture enters the picture, providing an answer to the problems that conventional farming techniques encounter.

Using precision farming methods is one of the key elements of smart agriculture. This entails gathering and analysing data on crop growth, weather patterns, and soil conditions using sensors, drones, and other high-tech equipment. Better crop management and increased yields come from using this data to inform decisions about fertilisation, irrigation, and insect control by Kazi K(2022).

Water and fertiliser waste can be decreased by using precision farming techniques. Farmers can minimise runoff and leaching by accurately delivering water and nutrients to crops through the use of sensors and irrigation systems. This lessens the impact of agriculture on the environment while also saving resources.

Using robotics and automation is another facet of smart agriculture. Tasks like planting, harvesting, and even crop health monitoring can be completed by automated devices, saving labour and boosting productivity. Large-scale farming enterprises, where labour expenses can be a major expense, will especially benefit from this by Kasat el al(2023).

Furthermore, artificial intelligence-AI and data analytics are also used in smart agriculture. Farmers may uncover possible problems, understand crop growth patterns, and make data-driven decisions by evaluating enormous volumes of data. This aids in agricultural yield prediction, planting schedule optimisation, and profit maximisation.