

Book Title (ID 2024\_12)

# Next-Generation Smart Farming: AI Applications and Technological Advancements

## About the Book

The book delves into the transformative potential of advanced technologies in modern agriculture, focusing on precision farming, artificial intelligence (AI), drones and smart farming systems. The book explores how AI-driven analytics and machine learning models are revolutionizing decision-making processes, enabling farmers to optimize crop yields and resource use. It examines the integration of big data analytics to analyze vast amounts of agricultural data, providing actionable insights for better farm management. The role of drones in monitoring crop health, assessing field conditions and applying treatments with pinpoint accuracy is thoroughly discussed, highlighting their contribution to enhanced productivity and sustainability. The book also addresses the implementation of Internet of Things (IoT) devices in agriculture, which facilitate real-time monitoring and control of various farming operations, from soil moisture levels to livestock health. Innovative irrigation management techniques enabled by smart sensors and AI algorithms are presented, showcasing their impact on water conservation and efficient use of resources. Emphasizing climate resilience, the book explores strategies to adapt farming practices to changing climatic conditions through predictive analytics and smart technologies. Additionally, it covers the integration of AI and IoT for comprehensive crop health monitoring, allowing early detection of diseases and pests and timely interventions. By combining theoretical insights with practical applications, "Next-Generation Smart Farming" serves as an essential resource for researchers, practitioners and policymakers aiming to harness the power of technology to drive the future of sustainable and resilient agriculture.

## Chapters outlines but not limited to:

**Chapter 1:** Transforming Agriculture with AI: An Introduction

**Chapter 2:** Innovative Farming Practices for the 21st Century

**Chapter 3:** Recent Breakthroughs in Smart Agriculture Technologies

**Chapter 4:** Harnessing AI for Sustainable Agricultural Development

**Chapter 5:** Precision Farming: Remote Sensing Techniques and Tools

**Chapter 6:** Geospatial Technologies: Mapping the Future of Agriculture

**Chapter 7:** Water Management Revolution: AI and Remote Sensing Synergy

**Chapter 8:** Advanced Strategies for Intensified Agriculture

**Chapter 9:** Predicting Crop Yields: AI and Machine Learning Approaches

**Chapter 10:** Remote Sensing Innovations for Smart Farming

**Chapter 11:** Agricultural Technology Disruption: AI's Role

**Chapter 12:** Building Climate-Resilient Agricultural Systems

**Chapter 13:** Big Data in Agriculture: Enhancing Weather Forecast Accuracy

**Chapter 14:** Smart Crop Monitoring Systems: Integrating AI and IoT

**Chapter 15:** Internet of Things in Agriculture: A New Era of Farming

**Chapter 16:** Optimizing Soil Moisture and Temperature with AI Solutions

**Chapter 17:** UAVs in Agriculture: Precision from Above

**Chapter 18:** Innovative Smart Irrigation Techniques for Water Efficiency

**Chapter 19:** Managing Biotic Stresses in Crops with Smart Technologies

**Chapter 20:** Soilless Cultivation: AI-Powered Techniques and Benefits

**Chapter 21:** Nutrient Management with Smart Farming Technologies

**Chapter 22:** AI and IoT Integration in Modern Soilless Farming

**Chapter 23:** Early Detection of Plant Diseases with AI Technologies

**Chapter 24:** Pest Control Innovations: AI-Driven Solutions

**Chapter 25:** Deep Learning for Leaf Disease Detection in Crops

**Chapter 26:** Automation in Agriculture: Robotic Seeding and Sowing

**Chapter 27:** Advanced AI Techniques for Accurate Crop Yield Prediction

**Chapter 28:** Overcoming AI Challenges in Modern Agriculture

**Chapter 29:** Boosting Efficiency in Precision Farming with AI

**Chapter 30:** Predictive Models for Smart Agricultural Practices

**Chapter 31:** AI-Based Decision Support for Farmers: A Game Changer

**Chapter 32:** Geospatial Analysis for Enhanced Crop Health Monitoring

**Chapter 33:** Innovations in Soil Health Assessment with Remote Sensing

**Chapter 34:** Adapting to Climate Change with Smart Farming Technologies

**Chapter 35:** AI-Powered Weather Predictions for Better Farming Decisions

**Chapter 36:** IoT-Enabled Crop Management Systems: Real-Time Solutions

**Chapter 37:** Sensor Innovations for Accurate Agricultural Data Collection

**Chapter 38:** The Future of Drones in Precision Agriculture

**Chapter 39:** Managing Smart Greenhouses with AI and IoT Technologies

**Chapter 40:** Blockchain in Agriculture: Ensuring Transparency and Traceability

**Chapter 41:** Ethical Implications of AI in Agriculture

**Chapter 42:** Future Directions in AI-Driven Agricultural Innovations

**Chapter 43:** Enhancing Farm Productivity with Advanced AI Tools

**Chapter 44:** Geospatial Data Integration in Precision Agriculture

**Chapter 45:** AI-Driven Soil Fertility Management

**Chapter 46:** Leveraging Big Data for Climate-Resilient Farming

**Chapter 47:** Predictive Analytics in Smart Agriculture

**Chapter 48:** IoT and AI for Enhanced Crop Quality and Yield

**Chapter 49:** Sustainable Farming Practices with AI Innovations

**Chapter 50:** Redefining Agricultural Practices with Next-Gen Smart Technologies

**\*\*Note:** Chapter title may be modified or new chapter may also be proposed by the author.

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