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Review

## APPLICATION OF DRONES TECHNOLOGY IN AGRICULTURE: A MODERN APPROACH

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**Abstract-** Drone technology has emerged as a transformative tool in modern agriculture, offering numerous applications such as crop health monitoring, weed management, evapotranspiration estimation, spraying, and other essential farm operations. Regularized smart-farming solutions are increasingly incorporating unmanned aerial vehicles (UAVs), which have proven to be highly versatile and efficient. The use of agricultural UAVs has expanded across various domains, including pesticide and fertilizer application, seed sowing, growth assessment, and field mapping. The demand for agricultural UAVs is anticipated to grow, driven by advancements in related technologies. This study explores the latest trends, applications, and innovations in agricultural UAVs, highlighting control technologies, equipment advancements, and real-world agricultural use cases. Additionally, the future prospects and challenges associated with agricultural UAVs are discussed. By operating safely

and at high speeds, drones can efficiently cover large and small properties, aiding in resource, asset, and land management. Many farms now utilize drones to monitor water levels in reservoirs and access previously challenging areas, mitigating risks to operators and the environment. This study emphasizes the critical role of drones in enhancing crop quality, protecting fields, and improving overall agricultural productivity. Furthermore, it identifies some of the best agricultural drones currently available, providing insights into their features and benefits.

**Keywords:** *Drone; UAV; smart farming; fertilizer spraying; seed sowing; growth assessment; mapping.*

## INTRODUCTION

Agriculture, the backbone of global food security, has undergone a significant transformation with the advent of modern technology. Amid the rising demand for sustainable and efficient farming practices,

drone technology, or unmanned aerial vehicles (UAVs), has emerged as a pivotal innovation. These aerial systems are reshaping traditional agricultural practices by providing precision, efficiency, and scalability, making them indispensable in modern farming.

Drones are revolutionizing agriculture with their unparalleled ability to gather vast amounts of data quickly and efficiently. Their applications range from pesticide spraying, replacing labor-intensive and hazardous conventional methods, to operating effectively in challenging terrains like hills. By integrating advanced technologies such as artificial intelligence (AI) and machine learning (ML) with high-resolution Normalized Difference Vegetation Index (NDVI) imaging, drones provide critical insights into soil conditions, plant health, and crop yield predictions. Using image processing algorithms, individual plants can be located and analyzed to detect signs of stress, enabling farmers to take preventive actions to halt the spread of diseases.

Data collected by drones, combined with satellite-based remote sensing, empowers farmers to address biotic stresses such as insect pests and diseases, optimize fertilization, rationalize irrigation, and adapt to climate change. The COVID-19 pandemic highlighted the potential of drones to mitigate agricultural labor shortages, creating new opportunities for their adoption amidst physical distancing measures and lockdown restrictions.

As the global population is projected to reach approximately 10 billion by 2050,

food production must increase by 70% to meet the growing demand. Automation, robotics, and the integration of big data, the Internet of Things (IoT), and AI in agriculture are pivotal for achieving this target. Drones, or unmanned aerial vehicles (UAVs), have become central to smart agriculture by significantly reducing labor hours, improving measurement accuracy, and enhancing productivity. Compared to traditional agricultural machinery, UAVs are cost-effective, easy to operate, and versatile, with applications in pest and fertilizer spraying, seed planting, weed detection, fertility assessment, field mapping, and crop forecasting.

The rapid development of agricultural sensors, such as yield, weed, temperature, and humidity sensors, has amplified the potential of precision agriculture. UAVs equipped with multispectral and hyperspectral cameras capture high-resolution aerial imagery, enabling detailed field analysis. Vegetation indices, such as NDVI, derived from UAV data, allow farmers to monitor crop health and detect field variations with precision.

Despite their advantages, agricultural UAVs face technical challenges, including limited battery efficiency, short flight times, restricted communication ranges, and payload capacities. Overcoming these limitations is critical for the next generation of agricultural solutions. Addressing these challenges will require advancements in precision positioning, navigation, imaging technologies, sensor integration, and the development of innovative equipment and materials.

This review explores the latest trends, technologies, and applications of UAVs in agriculture. It highlights their role in enhancing productivity, sustainability, and resilience in modern farming. By examining current practices and identifying future opportunities, this study underscores the transformative potential of drones in achieving efficient, data-driven food production.

Drones are versatile tools capable of performing a wide range of agricultural tasks, including crop health monitoring, pest and weed management, irrigation planning, and resource optimization. Equipped with advanced imaging systems, sensors, and software, agricultural UAVs offer high-resolution aerial views that enable farmers to detect issues, assess crop health, and take timely corrective actions. This capability reduces labor dependency, minimizes resource wastage, and enhances overall productivity.

One of the key applications of drones is in precision agriculture, where their use ensures the targeted application of fertilizers, pesticides, and water. This not only improves crop yields but also reduces the environmental footprint of farming practices. Moreover, drones facilitate efficient monitoring of large agricultural landscapes, providing data critical for decision-making and resource management.

In addition to routine farming activities, drones are becoming increasingly essential for tasks that were once considered labor-intensive or hazardous. For instance, monitoring water levels in reservoirs, surveying inaccessible areas, and mapping

farmland boundaries are now simplified and safer with UAVs. The ability of drones to operate in challenging terrains and under diverse climatic conditions further underscores their significance.

The global market for agricultural drones has witnessed exponential growth, driven by continuous technological advancements and the growing adoption of precision farming. However, despite their immense potential, challenges such as high initial costs, technical expertise requirements, regulatory constraints, and limited connectivity in rural areas remain barriers to widespread adoption.

This study aims to provide a comprehensive overview of drone technology in agriculture, highlighting its current applications, trends, and potential future developments. By examining the benefits and challenges associated with UAV use in real agricultural settings, this paper seeks to underscore the transformative role of drones in achieving sustainable agricultural practices.

## **AGRICULTURAL DRONE**

The evolution of drone technology is largely driven by the miniaturization of sensors such as pressure sensors, magnetometers, gyros, and accelerometers. These sensors are not only becoming smaller but are also demonstrating enhanced performance with each advancement [14,15]. The integration of strong CPUs, GPS modules, and extended digital radio ranges further accelerates the progress of drone technology. These advancements enable the development of smaller UAVs with increased payload capacities, resulting in more efficient

monitoring and management of distant agricultural fields [16,17].

Modern agriculture drones are equipped with cutting-edge embedded systems and motor technologies, ensuring precise control and adaptability for various field operations. They are designed to perform tasks such as crop health monitoring, pest control, irrigation planning, and fertilization with exceptional accuracy and minimal manual intervention.

The operational mechanism of agricultural drones in the field is depicted in Fig. 1, showcasing their versatility and efficiency in enhancing agricultural practices. These drones collect critical data and provide actionable insights, empowering farmers to make informed decisions and optimize resource utilization.

### **Fixed-Wing UAVs**

Fixed-wing UAVs are equipped with stationary wings in the form of aerofoils, which generate lift when the aircraft reaches a specific speed. Over the last decade, fixed-wing UAVs and helicopters have dominated the unmanned aerial vehicle (UAV) market. Recently, however, the focus in precision agriculture has shifted towards multicopters, which now represent about half of all UAV models on the market [13].

### **Benefits, Drawbacks, and Uses**

Table 1 and Fig. 2 provide a comparative overview of fixed-wing UAVs, helicopters, and multicopters, highlighting their advantages, disadvantages, and applications.

### **Helicopters**

Helicopter UAVs use a single set of horizontally rotating blades attached to a central post for lift and propulsion. These UAVs can fly forward, backward, hover over a target, and take off or land vertically. These unique capabilities make them ideal for operation in crowded or remote areas where fixed-wing drones cannot function. Fig. 3 illustrates a typical helicopter UAV.

### **Multi-Copters**

Multi-copters, also known as rotorcraft, feature multiple sets of horizontally rotating blades (usually 4-8) to achieve lift and motion control. Recent advancements in artificial intelligence (AI) have revolutionized the use of semi-controlled drones for agricultural surveillance [18,19].

#### **1. AI Integration**

Semi-controlled drones initially relied solely on sensor output for decision-making. With the incorporation of AI, drones can now process real-time data and make independent decisions based on prior training. This capability has enhanced agricultural productivity by enabling real-time spatial variability mapping.

#### **2. Applications**

Multi-copters are widely used in agriculture for:

Crop health monitoring

Fertilizer and pesticide application

Irrigation management

Soil health assessment

Collecting basic crop data for analytical models

### 3. Automation Potential

While current drones are semi-automated, they are rapidly evolving towards full automation. The integration of GPS-based autonomous controls, along with advanced cameras, sensors, and data processing capabilities, has significantly expanded their utility in farming.

#### Emerging Trends and Prospects

The adoption of small UAVs in agriculture is growing rapidly due to their ability to:

Collect spatial information for agricultural planning

Perform real-time data analysis for predictive insights

Reduce dependency on manual operations

Despite challenges such as battery efficiency and payload limitations, drones are revolutionizing agricultural practices by offering precise and actionable data for improved decision-making.

#### Potentials and Problems of Using Drones in Agriculture

Drones have immense potential in agriculture, offering innovative solutions to various challenges. They can analyze soil and fields for planting schedules, irrigation, and soil nitrogen levels, creating 3D maps for precise soil analysis, including moisture content and erosion. Additionally, advancements in drone technology enable seed pod planting, where drones deposit nutrient-rich pods into prepared soil, reducing planting costs, though this method is not yet widely adopted. Crop monitoring, one of the most significant challenges for

farmers, has been revolutionized by drones through multispectral data collection, providing early insights into crop health. Drones equipped with reservoirs can efficiently spray fertilizers, insecticides, and herbicides, reducing human exposure to chemicals and increasing spraying speed up to five times compared to traditional methods. They also aid irrigation by detecting moisture-deficient areas using thermal or multispectral sensors, ensuring timely and targeted water application.

Furthermore, drones play a crucial role in assessing crop health by detecting visible and near-infrared light reflections to monitor stress levels and health changes over time. They improve crop surveillance by mapping landscapes and identifying areas requiring intervention, with applications extending to insurance claim verification. Drones are also effective in identifying and controlling weeds, pests, and diseases, reducing chemical usage and costs. With LiDAR sensors, drones estimate biomass by measuring canopy density and height, aiding yield predictions for crops like sugarcane and forest lumber. Additionally, drone flights can deter birds from damaging seeds. Despite these advantages, challenges such as high costs, limited accessibility, and technical expertise requirements must be addressed to maximize their utility in agriculture.



Fig. 1. Agriculture drone is being used in the field of agriculture



Fig. 2. Fixed-wing UAV drone is being used in the field



Fig. 3. A helicopter drone is being used in the field of agriculture

Table 1: Different Types of Aerial Imaging Systems Used in Precision Agriculture

Type of Aerial Platform	Examples	Price Range	Applications in Agriculture	Advantages	Disadvantages
Pilot Aircraft	- M-18 Dromader - PZL-106AR Kruk	Very High	- Crop scouting - Fertilizer and pesticide spraying for large areas - Drought monitoring - Security and surveillance	1. High speed 2. High flight time 3. Higher payload weight 4. Covers hundreds of hectares quickly	1. High operating cost 2. High-altitude flight 3. Limited inspection of small isolated fields
Single Rotor Helicopter (UAV)	- Yamaha RMAX - Align Demeter E1 - SR20 and SR200	High	- Pesticide spraying in remote areas - Crop height estimation - Soil and field analysis - Crop classification	1. High payload capacity 2. Higher flight time 3. Higher speed 4. Strong and durable	1. Heavy setup 2. Costly 3. High-altitude flight 4. Noise and vibration 5. Stability issues
Fixed Wing	- AgEagle RX60 - eBee Ag - Precision Hawk - Lancaster - Sentera Phoenix 2 - Trimble UX5	Medium-High	- Large-area crop monitoring - Crop health status evaluation - Fertilizer and pesticide spraying	1. Simpler architecture 2. Easier maintenance 3. Long endurance and range 4. Higher flight speed	1. Limited accessibility 2. Less wind resistance 3. Launching difficulties 4. Landing difficulties
Multi-Copter	- DJI Phantom 4 PRO - AGCO Solo	Low-Medium	- Nutrition and crop stress management - Spot pesticide spraying for small fields	1. Site-specific management 2. Low-altitude flight 3. Better stability	1. Low speed 2. Low payload capacity 3. Complex architecture 4. Difficult maintenance

### Benefits, Costs, and Savings in Using Drones in Agriculture

Drones offer numerous benefits in agriculture, contributing to improved security, efficiency, and cost-effectiveness. Piloted by trained professionals, drones spray crops from a distance, safeguarding farmers and laborers from hazardous

chemicals and unfavorable working conditions. With high field capacity and efficiency, drones can spray 50 to 100 acres per day, significantly outperforming traditional knapsack sprayers by operating up to 30 times faster.

Drones also reduce wastage through high atomization, conserving 30% of the insecticides during spraying. They allow precise application of chemical fog on crops at various growth stages. Additionally, drones save up to 90% of water compared to conventional methods by employing ultra-low volume spraying technology.

This efficiency makes drone spraying 97% less expensive than traditional techniques.

Built for durability, agricultural drones are easy to use and maintain, requiring minimal upkeep and offering a long productive lifespan. Replacement parts are readily available through drone service providers, ensuring seamless operation. These advantages make drones a transformative tool in modern agriculture, providing substantial savings and enhancing overall productivity.

### Problems and Bottlenecks in Using Drones in Agriculture

1. **Flight Time and Range:** One of the primary limitations of agricultural drones is their short flight time, typically ranging from 20 to 60 minutes. This is due to the relatively large payloads they carry, which limit their endurance. As a result, drones can only cover a small portion of land per charge. To achieve longer flight times, the cost of the drone significantly increases.

2. **Initial Cost:** Agricultural drones, especially those equipped for surveying, can be quite expensive. For example, fixed-wing drones like Precision Hawk's Lancaster can cost up to \$25,000. The price varies based on the required features, sensors, and payload capacities. Drones with additional hardware, software, or sensors tend to be more expensive.

3. **National Laws:** In India, the operation of drones is governed by the Civil Aviation Regulations (CAR) issued by the Directorate General of Civil Aviation. As per the Unmanned Aircraft System (UAS) Rules 2020, drone operators are required to obtain an Unmanned Aircraft Operator's Permit (UAOP) and seek permission for each flight through the Online Digital Sky platform. These regulations, including the No Permission No Takeoff (NPNT) policy, add complexity to drone usage in agriculture.

4. **Connectivity:** A significant issue for many farmers is the lack of internet access on arable farms, which limits their ability to operate drones effectively. In such cases, farmers would need to invest in connectivity solutions or purchase drones with the ability to store data locally for later transfer and processing.

5. **Weather Dependency:** Drones are heavily reliant on weather conditions, making them less effective in windy or rainy weather. Unlike traditional aircraft, drones' stability and flight capabilities are affected by adverse weather conditions, which can lead to delays or reduced efficiency.

6. **Knowledge and Skill:** The ability to analyze drone-captured images requires

specialized knowledge and skills, which the typical farmer may not possess. Farmers need to either hire skilled personnel who are proficient in image analysis software or invest time in learning how to process and interpret the data themselves. This additional expertise is a barrier to widespread adoption for some.

These methods are easy to use and call for little data. However, due of their weak theoretical foundation, they are challenging to implement in complicated disciplines.

### Conclusions and Future Challenges

This review paper has highlighted the transformative potential of drone technology in precision farming, specifically focusing on two key applications: crop monitoring and pesticide spraying. The paper examines significant advancements in drone structures, sensor development, and innovations in pesticide spraying technology, along with the integration of deep learning for data analysis. The application of sensors, Internet of Things (IoT), mechatronics, and other technologies in agriculture has become essential in recent years, enabling more efficient and precise farming practices.

Drones have proven to be a valuable tool for mapping variability across agricultural fields and optimizing the use of agricultural inputs. Their utility extends beyond traditional crop monitoring to encompass diverse fields such as horticulture, forestry, fishing, and livestock management. Drones are

applicable throughout the entire crop lifecycle—from seed germination to harvesting—allowing farmers to identify underperforming areas of crops, thus providing more precise insights for informed decision-making.

Over the last two decades, the drone market has seen remarkable growth, revolutionizing not just agriculture, but also industries like manufacturing and military sectors. This study emphasizes the importance of incorporating drones into agricultural practices to enhance crop quality and yields. Furthermore, it signals the need for further research and development to expand the range of drone applications in agriculture.

Despite the promising advancements, several challenges remain, including the high cost of drones, regulatory hurdles, limited flight durations, and the need for technical expertise to interpret data effectively. As drone technology continues to evolve, overcoming these barriers will be crucial to maximizing the benefits of drones in agriculture.

The future of agriculture lies in the widespread adoption of drone technology, and its integration into farm management systems will continue to drive innovations in crop monitoring, disease management, and precision application of resources, ultimately leading to more sustainable and efficient farming practices.

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### REFERENCES

1. Noor F, Noel AS. Perception of farmers with reference to drones for pesticides spray at Kurukshetra District of Haryana, India. *Asian Journal of Advances in Agricultural Research*. 2023;22(3):9–15. Available:<https://doi.org/10.9734/ajaar/2023/v22i3440>
2. Ayamga M, Akaba S, Nyaaba AA. Multifaceted applicability of drones: A review. *Technological Forecasting and Social Change*. 2021, Jun 1;167:120677.
3. Hunter MC, Smith RG, Schipanski ME, Atwood LW, Mortensen DA. Agriculture in 2050: Recalibrating targets for sustainable intensification. *Bioscience*. 2017;67(4): 386–391
4. HI Son Ju. Discrete event systems-based modeling for agricultural multiple

- unmanned aerial vehicles: Automata theory approach. in Proc. 18th Int. Conf. Control, Autom. Syst. (ICCAS). 2018, Oct;258–260.
5. Kim WJ, Kang JH. ToA-based localization algorithm for mitigating positioning error in NLoS channel. *J. Inst. Control, Robot. Syst.* 2018;24(11):1043–1047.
  6. Mogili UR, Deepak BBVL. Review on application of drone systems in precision agriculture'. *Procedia Comput. Sci.* 2018, Jul;133:502–509.
  7. Brief L. Growth Opportunity in Global UAV Market. Las Colinas, TX, USA; 2011.
  8. Mazur M, Wisniewski v, McMillan v. Clarity from Above: PwC Global Report on the Commercial Applications of Drone Technology. Warsaw, Poland: Drone Powered Solutions; 2016.
  9. SK von Bueren A, Burkart A, Hueni U, Rascher MP, Tuohy, Yule IJ. Deploying four optical UAV-based sensors over grassland: Challenges and limitations. *Biogeosciences.* 2015;12(1):163–175.
  10. Torun E. UAV Requirements and design consideration. Turkish Land Forces Command Ankara, Turkey, Tech. Rep; 2000.
  11. Vargas-Ramírez N, Paneque-Gálvez J. The global emergence of community drones (2012–2017). *Drones.* 2019;3:1–24. Available:<https://doi.org/10.3390/drones3040076>.
  12. Giacomo R, David G. Unmanned Aerial Systems (UAS) in Agriculture: Regulations and Good Practices; 2018.
  13. Radoglou-Grammatikis P, Sarigiannidis P, Lagkas T, Moscholios I. A compilation of UAV applications for precision agriculture. *ComputNetw.* 2020;172. Available:<https://doi.org/10.1016/j.comnet.2020.107148>
  14. The State of Food Security and Nutrition in the World 2020 | FAO | Food and Agriculture Organization of the United Nations n.d. Available:<http://www.fao.org/publication/s/sofi/2020/en>
  15. Marinello F, Pezzuolo A, Chiumenti A, Sartori L. Technical analysis of unmanned aerial vehicles (drones) for agricultural applications; 2016.
  16. Barkunan SR, Bhanumathi V, Sethuram J. Smart sensor for automatic drip irrigation system for paddy cultivation. *ComputElectron Eng* 2019;73:180–93. Available:<https://doi.org/10.1016/j.compeleceng.2018.11.013>
  17. Wang N, Zhang N, Wang M. Wireless sensors in agriculture and food industry - Recent development and future perspective. *Comput Electron Agric* 2006; 50:1–14.
  18. Available:<https://doi.org/10.1016/j.compag.2005.09.003>.
  19. Kellenberger B, Marcos D, Tuia D. Detecting mammals in UAV images: Best practices to address a substantially imbalanced dataset with deep learning. *Remote Sens Environ.* 2018;216:139–53. Available:<https://doi.org/10.1016/j.rse.2018.06.028>.
  20. 17. Putra BTW. A new low-cost sensing system for rapid ring estimation of

- woody plants to support tree management. *Inform Process Agric.* 2020;7:369–74. Available: <https://doi.org/10.1016/j.inpa.2019.11.005>
21. 18. Huang J, Wang X, Li X, Tian H, Pan Z. Remotely Sensed Rice Yield Prediction
  22. Using Multi-Temporal NDVI Data Derived from NOAA's-AVHRR. *Plos One.* 2013;8.
  23. Available: <https://doi.org/10.1371/journal.pone.0070816>.
  24. Goudarzi S, Kama N, Anisi MH, Zeadally S, Mumtaz S. Data collection using unmanned aerial vehicles for Internet of Things platforms. *ComputElectr Eng.* 2019; 75:1–15. Available: <https://doi.org/10.1016/j.compeleceng.2019.01.028>.
  25. Geetharamani G, J AP. Identification of plant leaf diseases using a nine-layer deep convolutional neural network. *ComputElectr Eng.* 2019;76:323–38. Available: <https://doi.org/10.1016/j.compeleceng.2019.04.011>
  26. Krishna AV, Narayana AH, Madhura Vani K. Fully homomorphic encryption with matrix based digital signature standard. *Journal of Discrete Mathematical Sciences and Cryptography.* 2017;20(2):439- 444.
  27. Devi G, Sowmiya N, Yasoda K, Muthulakshmi K, Balasubramanian K. Review on application of drones for crop health monitoring and spraying pesticides and fertilizer. *J Crit. Rev.* 2020;7(6):667-672.
  28. Yallappa D, Veerangouda M, Maski D, Palled V, Bheemanna M. Development and evaluation of drone mounted sprayer for pesticide applications to crops. *IEEE Global Humanitarian Technology Conference (GHTC).* 2017;1-7.
  29. Reinecke R, Prinsloo T. The influence of drone monitoring on crop health and harvest size. *1st International Conference on Next Generation Computing Applications (Next Comp).* 2017;5-10.
  30. Hafeez A, Husain M, Singh SP, Chauhan A, Khan MT, Kumar N, et al. Implementation of drone technology for farm monitoring and pesticide spraying: A review. *Information Processing in Agriculture;* c2022. Available:<http://www.fao.org/eagriculture/news/exploringagricultural-drones-future-farming-precision-agriculture-mapping-and-spraying>
  31. Aditya SN, Kulkarni SC. Adoption and Utilization of Drones for Advanced Precision Farming: A Review. *International Journal on Recent and Innovation Trends in Computing and Communication,* ISSN: 2321-8169. 2016; 4(5):563-565.
  32. Beriya A. Application of drones in Indian agriculture (No. 73). *ICT India Working Paper;* c2022.
  33. Mogili UR, Deepak B. Review on application of drone systems in precision agriculture. *Procedia computer science.* 2018; 133:502-509.
  34. Dutta G, Goswami P. Application of drone in agriculture: A review. *IJCS.* 2020;8:181-187.

35. Gerard S. E-agriculture in action: Drones for agriculture. Published by Food and Agriculture Organization of the United Nations and International Telecommunication Union, Bangkok. c2018;1-105.
36. Maurya P. Hardware implementation of a flight control system for an unmanned aerial vehicle. Retrieved 06 01, 2015, from Computer science and engineering; c2015.  
Available:<http://www.cse.iitk.ac.in/users/moona/students/Y2258.pdf>.
37. Pathak H, Kumar AK, Mohapatra SD, Gaikwad BB. Use of Drones in Agriculture: Potentials, Problems, and Policy Needs. ICAR-NIASM. 2020;12(2):12-23.
38. Joshi E, Sasode DS, Singh N, Chouhan N. Revolution of Indian Agriculture through Drone Technology. Biotica Research Today. 2020;2(5):174-176.
39. Kurkute SR, Deore BD, Kasar P, Bhamare M, Sahane M. Drones for smart agriculture: A technical report. International Journal for Research in Applied Science and Engineering Technology. 2018; 6(4):341- 346.