

Exploit the Attainment of Drones for Sustainable Agriculture

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Abstract:

Drones are being used in agriculture more frequently these days. The two most pressing concerns facing the world today climate change and environmental pollution have a negative impact on agricultural productivity. Regarding social, economic, and environmental aspects, using drones for farming helps promote sustainable agriculture. As can be observed, the current climate is unfavourable for Indian agriculture, as evidenced by the advent of the corona epidemic and the current locust swarm. During the Covid epidemic, it is challenging to work in congested and remote locations. It is therefore imperative to implement sophisticated reforms in agriculture in light of these situations. Since it may prove to be a valuable means of supplying food for the world's population, which is expanding daily, the impact of ever-increasing technology on agriculture should be viewed as a positive development.

Keywords- Agriculture, Drone, Farming system, India Climate change

Introduction:

Due to rising needs for food production and consumption, the global supply of commodities is at an all-time high and commodity prices are at an all-time low, putting the modern farming industry at a crossroads. In addition, as the agriculture sector attempts to safeguard the supply chain's security, climate change continues to add new levels of complexity. These difficulties are made even more difficult by the rapidly changing environmental circumstances, and according to the most recent data, the loss of agriculture in Europe as a whole due to climate change might reach 16% by 2050. Optimizing sustainability credentials will continue to be a top priority in order to reduce the negative effects on people's health and wellbeing as well as the environment. This is especially true given that



improved sustainability measures may also generate additional economic benefits by allowing agriculture professionals to concentrate their resources and efforts more wisely.

In example, using drones give the chance to acquire a comprehensive inspection of the area and better utilise the farmer's time than having them just stroll out in the dark. Expecting to stumble across any potential trouble areas in a field that may be higher than the average person's head.

Evolving sustainable agriculture through drones:

- Use of available technologies is the first choice to enable sustainability and transformation in agriculture. Agricultural sector has to increase capability and productivity to realize its hidden potential. There is a need to identify the challenges in existing practices and their possible sustainable solution with the help of advanced technologies. In the current agricultural practices, there are many unsustainable methods related to irrigation, chemical spraying, crop monitoring, pest management, etc.
- The new technologies of drone are used such as Artificial Intelligence (AI), Big Data, Satellite Technology, Drone Technology, Internet of Things (IoT), Digital Dashboards and Portals, Climate Smart Advisories, Information Technology (IT), Geographic Information System (GIS), Global Positioning System (GPS), Remote Sensing (RS) and Cloud Computing are used in solving the traditional challenges and advancement of the agriculture sector. Among these drone technology is playing a great role.

Why adopt drone in sustainable agriculture?

1. Photogrammetry, Data Acquisition, and Accurate Farm Analysis

- Drone services can help farmer's access highly accurate maps and 3D models of the fields. This method is known as drone photogrammetry.
- Drones can be used with different types of sensors and cameras. For example, multispectral cameras can help farmers access important data that would otherwise be very difficult and costly to obtain.

2. Improved Crop Yields

- Drones help them stay on top of soil conditions, plant disease, and irrigation issues. Furthermore, this promotes plastic free and eco-friendly features in them. When all these things are in proper conditions, crops will stay healthy.



- With the help of a drone with a camera, farmers can quickly identify areas of the farm where healthy crops are not being produced. They can then target any specific area for any treatment that is necessary.
- Drones can help improve yield and the overall quality of crops.

3. More Efficient and Economical

- Drone services have quickly become popular in the agriculture industry.
- Drones are much more time efficient and cost-effective than manned aircraft, like helicopters or airplanes. Things like inspection, surveillance, mapping, and crop spraying can be made directly with the help of drone services.
- Drones can also be used to spray crops with water, herbicides, pesticides, fertilizers, and even to plant seeds.

4. Helps Fight The Climate Crisis

- With the help of data-backed targeted treatment, farmers and agricultural businesses can reduce the use of chemicals. Hence resulting drones to reduce the need for fuels that other traditional methods with heavy labor equipment would require. This becomes a significant factor to consider because it can significantly reduce the carbon footprint of the agriculture industry.

5. Locust control

- Locust swarms are known to feed on crops, trees, and other types of plants. This feeding can destroy crops planted, causing famine and deprivation in societies that solely rely on these crops for survival. In recent times, swarms of locusts have occupied several areas in India, especially Rajasthan. With nearly 90,000 Hectares of land affected across 20 districts, these growing swarms are threatening to amplify into an agrarian disaster.
- Most nations battling locust swarms depend significantly on organophosphate chemicals. These are utilized in little concentrated lots by vehicle-mounted and aerial sprayers. Rajasthan has stationed drones to carry out the spraying efficiently. Drones can diffuse pesticides on approximately 2.5-acres in merely 15 minutes. Using drones to combat the locust swarms is an immediate, secure, and practical approach.

Conclusion:



The agricultural sector is moving towards clever, new strategies to address the always increasing needs. Undoubtedly, the future of the Indian agrarian community is agricultural drone technology, it also reduce the cost and improve the yield. A new revolution in the agriculture industry is brought about by the drone acting as "an eye in the sky." A mix of software, sensors, cameras, and various analytical tools can automatically collect and translate data and images into useful information and insights, which greatly reduces the likelihood of human error. In practically every type of industry, drones have altered how data is collected, and in the years to come, they're only going to get better and more prevalent.

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