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Effect of Drone Technology on Farmer in Agriculture Field

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Introduction

In current periods, various statements by the government of India have stated the emphasis of the government on sponsoring drones in the Agricultural sector. Drone also known as Unmanned Aerial Vehicle. Developed countries have already in progress use of UAV's in their precision agriculture, photogrammetric and remote sensing. For drone promotion, Bharat Drone Mahotsav (Festival) 2022, biggest drone festival of India. It was held on May 27 and 28, 2022 in New Delhi. Budget of 2022-23, the government is extremely to use 'Kisan' Drones to improvement the agricultural division in the country. Kisan Drones will be enthused for crop assessment, soil sampling and fertilizing, digitization of land records and spraying of pesticides and nutrients animal population surveillance, real-time imagery and sensor data collection, and field management etc. If drones are used to spray the pesticides to avoid the health problems (respiratory related) of humans when they (humans) spray manually. Drones can be used to transport vegetables, fruits, fishes to the marketplace directly from the farms. "These items will be supplied directly to the market with minimum damage, consuming lesser time, resulting in more profits to farmers and fishermen," The government of India has announce a number of subsidies on purchase of drones. Drones save time and are reported to be effective in resource operation with substantial water savings.Drones have long been thought of as expensive toys. One area that has seen little attention from drones, perhaps to its detriment, is the agricultural sectorso for promoting the use of Kisan Drones, the Indian Agriculture Ministry is providing 50% maximum subsidy for SC-ST, small and marginal, women and farmers of north-eastern states to buy drones.

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For other farmers, financial assistance will be given upto 40 percent maximum subsidy. Drones covers theoretical and experimental framework to develop an autonomous aerial vehicle capable of providing farmers very important information related about the plant growth medium. Also aerial imagery inside or outside field can reveal areas where problems exit to better manage them. Drones technology is new methods satisfied the food requirements and also provided employment opportunities to billions of people. Drones technologies saves the excess use of water, pesticides, and herbicides, maintains the fertility of the soil, also helps in the efficient use of man power and elevate the productivity and improve the quality.

Uses of drone technology in agriculture field

1) Ground Mapping:-Drones with their inherent capability to survey vast tracts of lands are perfect tools to perform. Terrain mapping for better management of the agricultural industry and other sensors are used by farmers to map the terrain across vast swaths of lands as a reconnaissance tool for land preparations. The advanced computer vision capabilities of drones enable them to accurately map the terrain and offer real-time feedback to farmers for efficient planning and management of fields.

2) Solar Plate Assessment:-Farms across the world are switching to renewable energy sources like solar panels to meet their energy needs. By installing large solar farms for agricultural practices, farmers not only ensure a consistent power supply but also significantly reduce the energy expenses.AI-powered drones can be used to significantly reduce the time and cost required for inspection of solar panels. The farming drones can be used for regular monitoring of the solar panels and assess any potential defects in the grid before it jeopardizes the entire system.

3) Livestock Observation: - The drones in the agriculture industry are also widely used by farmers for effective livestock management. AI-backed programmable drones are perfect tools to automate the monitoring of livestock at the fraction of the cost. These drones can be used to keep track of the livestock, as well as, to identify any injured or missing livestock. It can also be used to identify pastures across vast swaths of lands and can be pre-programmed to continue tracking the livestock across the pasture.

4) Soil and Field Investigation: - Drones are great tools to access insightful data for the quality of the soil at the beginning or end of a crop cycle. AI drones equipped with LiDAR

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can be used to create 3D maps of the soil to be able to understand any issues with the quality of the soil including the nutrients or any dead zone. All of this information can be pretty useful to determine the most effective planting patterns, as well as, improved crop management. Drones can also be sued to identify and monitor water resources more effectively across the fields.

5) Seed Planting: - Seed planting using drone technology is a relatively new technology as compared to other drones applications in agriculture. However, startup companies have been testing the technology for faster and more effective seed plantations. Some farming drone manufacturing companies are also testing the payload efficiency of drones in form of tree seeds, fertilizers, water, and herbicide to assess the cost-effectiveness of the technology. Once it gets passed the testing phase, drones would further strengthen the effectiveness and efficiency of the agriculture industry by making it much easier to plant seeds and deliver other required elements to the soil.

6) Crop Spraying:- Another area of drones application in the agriculture industry includes crop spraying. Traditionally, farmers are required to spray the entire fields manually with vehicles or at times some farmers also used airplanes for the purpose. However, both of these methods are either too slow or too expensive for the liking of modern-day farming.Today, smart drones approved by FAA can take huge reservoirs of fertilizers or pesticides as payload for efficient spraying across the field. In fact, AI drones can be programmed for spot spraying as well, making it much safer and cost-effective for farmers to manage the crop yields and stop pest infestation in crops.

7) Crop Mapping and Measuring:-Another vital drone application in the agriculture sector is the use of the technology in monitoring of crops across vast swaths of fields. Traditionally this has to be performed by farmers manually which takes forever and is highly inefficient. More recently tech companies have been using satellite or airborne imagery to survey and map the crop field, which again comes with high costs.

8) Irrigation Monitoring:-Another traditionally troublesome area for farmers has been monitoring and management of irrigation. With several miles long irrigation network, there's always a possibility of issues arising. Today, drones equipped with thermal imaging systems are effectively used to monitor the entire irrigation network efficiently and spot any issues in

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real-time. With access to real-time information through drones, farmers are in a better position to maximize the drainage and prepare contingency plans to cope with issues.

9) Health evaluation:- Lastly, drones are effectively used to monitor crop health. Drones equipped with infrared and thermal sensors are widely used to get real-time imagery for analysis of crop health. Companies like Folio3 offer customized crop health monitoring software that can be used to instantly assess the chlorophyll content, as well as, estimate soil fertility through crop imagery in the infrared and thermal region of the electromagnetic spectrum.

Advantages of drone technology

- It helps in achieving more yields by using resources effectively. It provides good ROI (Return on Investment)
- Drones are used in large scale farming for spraying of insecticides and pesticides due to its remote control operation from distant.
- It helps in monitoring environmental data which helps in smart farming.
- It helps farmers in scouting their fields quickly and efficiently. This saves time in determining status of fields.
- They are easy to use with very basic training.
- Latest agriculture drones help in collecting data which helps in improving crop health.
- It has integrated GIS (Geographic Information System) mapping. It helps in storing and analyzing all types of geographical and spatial data. It helps farmers in mapping in order to boost yields and in cutting costs to take business forward.
- With push of a button drone can return home.
- Thermal cameras help in finding wet and dry patches. This helps farmers avoid wastage of water.

Disadvantages of drone technology

- It requires basic knowledge and skills to operate the agriculture drones.
- Most of the drones have less flight time and covers less area. Drones having long flight time and long range are costlier. Drones having more features are also more expensive.
- Need to obtain government clearance in order to use it.

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- It uses same air space as commercial aircrafts and hence may interfere with manned aircrafts if it comes in their flight path.
- It is difficult to fly them in extreme conditions.

Conclusion

The production of agriculture is very important for food security in the world. The field management can be enhanced by using the UAV and rise the yield of productivity in order to feed the increasing population in the world. The uses of the UAV cannot solve all the difficulties in the field but it can relief some specific topics in agriculture. Agricultural UAVs has limitless potential in agriculture field. The integrated technology will help farmers in field operations. These techniques formulate farming more proficient, and can contribution forecast ROI on specific crops depend on their costs and margin within the market.

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