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DRONES TECHNOLOGY IN AGRICULTURE-SATELLITE FARMING

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Abstract: The article presents the review of researches of drone's technology in terms of agriculture. Drones are not only useful in agriculture but also can be applicable in civil engineering, industries, transport etc. In agriculture the drones that are majorly used for the estimation of the climatic conditions that are suitable for the crop growth. All this estimation will takes place with certain technologies like GPS, GIS and remote sensing. The Satellite farming is mainly useful for the assessment of the crop field and its variability, for doing right thing in right place and at right time. The impact of the satellite farming is more when compared with the conservation agriculture. Drones that examines the crop from the initial stage of the crop to harvesting time. The entire data that will be collected, where farmers can examine or monitor the crop regarding the healthy growth, the infestation of the pests and diseases which can be controlled thoroughly.

Keywords: Drones, satellite farming, conservation agriculture, GPS, GIS, Remote sensing, monitor.

I. INTRODUCTION

The drones that are majorly used in the field of military were about 85% and remaining 15% by the civilians. Taking data from the drone that will take place in different stages such as the analysis of the location, using the autonomous system of the drone, updating of the data and the output. The output will be examined by the farmers in terms of the agriculture. Drones that are various types based upon the fertilizer/pesticides application in the crop fields that i.e.; air application drones, rotor drones which can collect date. Moreover the air fertilizer application drones that are banned in the year of 1968 based on the insecticidal act. That was declared by the union government that drone spraying is insecure and it's illegal. But recently in the year of 2019 union govt clarified that few of the harmful pesticide such as endosulfon that has been restricted to use which is harmful to the environment. Other than that the drones plays several practices interims of the agriculture.

II. IMPORTANCE OF ADOPTATION OF THE DRONES

Drones have became most recognized in the industries as well as in agriculture because of its diversified and consideration for future of agricultural commodity. Drone that will emphasize the farmers to make proper decisions regarding the crop health, growth, crop treatment, irrigation practices and crop damage. The drones that will place a major role and helps in the boosting up of the crop yields and reducing the time as well as he expenditure.Drones that are majorly categorized with the artificial intelligence technology and mechanical learning process and that will includes the GPS,GIS and Remote sensing.

III.TOOLS AND TECHNIQUES IN SATELLITE DRONES:

It is a technology that includes or deals with the spatial information. It is processed to develop the information based upon the spatial and non-spatial data analysis.

1.GLOBAL POSITIONING SYSTEM(GPS):

GPS is a satellite based navigation system. It will navigates the location at anywhere on the earth. The main use of GPS in agriculture is for final yield mapping and doses or rate of fertilizer or pesticide application.

2.GEOGRAPHIC INFORMATION SYSTEM (GIS):

GIS will computerise the data storage this can be useful for the management of the crop production and the crop factors.

3.REMOTE SENSING(RS):

The remote sensing that consists of the data sensors which will collects data of a particular land. This also includes the detection, identification, measurement of the agricultural phenomenon.

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IV. WORKING OF DRONE:

It is a data based operation. In simple terms the drones that will works on the principle of the sensors,the GPS that is updated and then the data that is collected from different sectors after collection the data the sensors that are to be collected and the examination of the output should be done.

Fig:1-structure of drone-RC quadcopter.
https://www.gearbest.com/ (IMAGE SOURCE)

V. TYPES OF DRONES:-

There are majorly four(4)types of drones they are mainly classified based upon the usage:-

1.**Multiple rotor drone**:-multiple rotor that is again classified based upon the presence of the rotors: mainly consists of three rotors called as tricopter, drone consists of 4 rotors called quadracopter, drones consists of 8 rotors called octacopter. However the capability of the multiple rotor drone is about 20-40min where it can estimate 100-200 acres of land.

PROS:

- **It will have good camera control**
- **Can operate in difficulty area also.**

CONS:

- **The flight will be smaller and short payload capacity**

2. **Fixed wing drone**:-The capability of fixed wing drone is about 45-60min. And it can cover 500-900 acres of land.Fixed wing drones als varies in the sizes as well as interms of costs.few fixed wing drons that can fly for 16hours.

PROS:	**CONS:**
Speed of the flight will be fast.	It requires lot of space.
The huge area will be covered.	Expensive in cost.

3.**Single rotor helicopter**:- In this the number of rotors that are present are only 1.where this is cost effective.And this single rotor helicoptor is not safe.But it has a benifit that it is much greater efficient than multi –rotors.

4.**Fix wing hybrid VTOL**: It is a remote based manual control drone.it has the ability to fly large distances and can cover large area.In fix wing hybrid VTOL variour developmental types as taken place such as few are fixed downwards,and few are fixed verically.But normal fix wing will takes place verically.

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Fig:2-multiple rotor drone
https://www.intorobotics.com/diy-robot-chassis/

Fig:3-fixed wing drone
https://www.circuitstoday.com/types-of-drones

Fig:4-single rotor helicopter
https://www.circuitstoday.com/types-of-drones

Fig:5-fix wing hybrid VTOL.
https://www.circuitstoday.com/types-of-dro

VI. OTHER NAMES OF DRONES:-

UAS:-UNMANNED –AERIAL SYSTEM.
UAV:-UNMANNED AERIAL VEHICLE.
RPA:REMOTE PIOLET AIRCRAFT.
RPV:-REMOTE PIOLET VEHICLE.

PRACTICES OF DRONES IN AGRICULTURE:- satellite farming

Drones monitors various methods such as :

1. Irrigation monitoring.
2. Crop health monitoring.
3. Damage of crop production.
4. Soil analysis in the field.
5. Planting.
6. Agricultural crop spraying.
7. Tracking of the livestock/cattle.

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ADVANTAGES OF DRONES IN SATELLITE FARMING

- Receiving /obtaining the clear cut images at fog/cloudy regions also.
- Easy interpretation to know what is going on.
- Accessibility-difficulty places can also be accessed with this equipment.
- It is a time saving process.
- Overall yield will increases.
- Reduced environmental impact.

DISADVANTAGES OF DRONES IN SATELLITE FARMING

- More expensive to use and also to purchase all the material/equipment.
- Training should be required.
- High maintenance is required.
- Lack of technical expertise knowledge and technology.

VII. CONCLUSION

Hence, the use of drone technology is profitable and beneficial in the agriculture. During the ancient times there is not much development of technology people used to follow the conservation traditional methods. But the technology is gradually increasing day by day in terms of agriculture which can be utilised and can be benefited by the farmer. By day by day increasing and implementation of this technology can leads to lowering the costs of the equipments, improving of the images, new camera designs, nozzle type of sprayers all this will come into force as the development of the technology will goes on further.

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