

DRONE REVOLUTION

A NEW FRONTIER IN SMART AGRICULTURE

Sudeepta Pattanayak¹ and Dr. Siddhartha Das²

¹PhD Research Scholar, IARI, Pusa, New Delhi

²Post-Doctoral Fellow, Department of Ornamental and Agricultural Biotechnology, Institute of Plant Science, Agricultural Research Organization (ARO), Volcanic Center, Israel

In the era of modernization, Agriculture is suffering the unavoidable biotic and abiotic stresses from a long period of time. The uncertain climate, pest damage and emission of greenhouse gases are the major problem in agriculture system. Most part of the world is still not a hunger free place and majorly most in Asia. Now, What the world needs in this tough time is to increase the production and productivity in a smart way by ignoring the less land and little time. Industrialization has brought revolutionary changes not only in the field of medical science but also in agricultural science. The transformative potential of our recent technologies is now able to overcome the difficulties in every aspect. One of the latest advances in agriculture is the drone technology or unmanned aerial vehicles (UAV) which is an automated system to capture all types of high-resolution pictures from the sky and collect wide range of data. Application of drone technology has breached its border and extended its use in disaster risk reduction, early warning system, conservation of wild life, forestry, aquaculture etc.

Precision farming, one of the smart technologies in agriculture analyses the real time data and raw data to increase the agriculture productivity. Several data collected through drone is used to provide the proper solution with actionable information. Drone can be implemented at any stage throughout the cropping cycle such as:

• Soil examination-

The high-resolution pictures of the field, 3D maps and raw data will be used to analyse the soil and

its nutrient status. Further decision can be taken depending on the information.

• Planting

Drone shoot seeds coated with required nutrients and chemicals have high germination rate which lower down the cost of planting.

• Monitoring

Crop monitoring in a wide area requires more manpower. But the use of drone technique has made it easier with very less time.

• Fertilization

Drones take the high resolute pictures of soil and analyse the data to give the exact amount of fertilizer required. It is very helpful in spraying the required dose of fertilizers and chemicals in a large area by modulating the proper distance from ground.

• Irrigation

Monitoring a large farming area is one of the major limitations in agriculture as it requires more manpower and much time. But the hyperspectral and thermal sensor drones can identify the need-based areas for irrigation in the field.

• Crop health status

Multispectral images can be produced by using the infra-red and visible lights. The different parts of plant will reflect different amount of green light according to their health. The leaf spots, either its fungal or bacterial can be easily identified by using the type of image taken and how much light got reflected from which region of the plant.

DRONES: HOW IT HELPS?

The analytical data collected by drones gives more information as well as solution which is least possible in conventional method. This technique requires less manpower in a large area with minimum time duration. The use of drone is so easy and don't require high skilled pilot. It can perform the thermal and visual imaging of a field repeatedly and stay in the sky up to 30hours. The accuracy is much higher in drone technology than the traditional method.

Regulations by India government to fly the drones:

The operator of India should follow all the rules and regulations before flying the drone in sky. Privacy of people should be in first place of concern for the operator. The below given rules are the general regulations enlisted by Indian government to fly in sky.

- Pilot must be 18years or above to fly the drone.
- Flying of drone is prohibited in airport area, crowded place, military offices and training centres, temple areas etc.
- Privacy of people should not be breached while flying the drone.
- Drones can be used in day time and good weather condition.

- All drones should be well displayed with the license and the operator name with their contact details.
- All drones should carry liability insurance prior to flying
- Flying of a single drone is allowed at a time.
- Flying of drones is restricted to wildlife sanctuaries and national parks.

CONCLUSION AND FUTURE SCOPE:

The world requires potential techniques which consumes less time and manpower and gives an impressive result. Drone technology is one of the new frontiers in smart agriculture system. The more advantages of drone system have gained high demand as compared to conventional techniques. This revolutionary system in agriculture is now became a magnet in both developed and developing countries as well as youth entrepreneurs. Further focus should be given to the wide application and use of this novel technique by the government. More emphasis should be given on the registration and licensing of operators, risk management and implementation of rules and regulations which will benefit the future of agriculture. Once the mix technology is deployed, where optimum data is analysed in an automated way resulting a fully integrated solution, then vertical growth of agricultural system is no longer far.

