Krishi Netra

Application of Drone in India

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Manuscript No: KN-V2-05/002

Introduction:

The world's population is expected to grow 9 billion people by 2050, which would lead to a rise in agricultural consumption. Ensuring that every individual's meets his daily meals is very crucial. Considering this, the most promising industry is agriculture sector, which addresses the multitude of issues. Further, one of the biggest issues to overcome is lack of labour for farming. Extreme weather, insufficient and ineffective fertilizer application, infections, illnesses, allergies, and other health issues brought on by chemical application (fungicide, pesticide, insecticide, etc.) or insect/ animal bites are additional issues or challenges. Using cutting-edge technology in agriculture, like drones, has the possibility of dealing with a number of significant or minor difficulties.

Advantage:

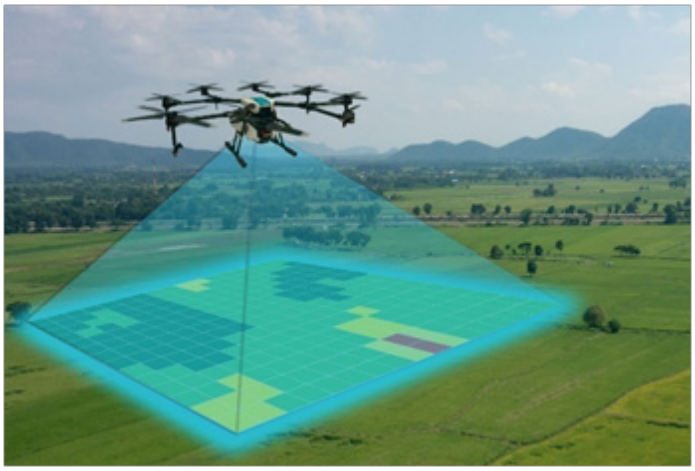
Large tracts of farmland can be quickly covered by drones. This makes it possible for farmers to promptly identify parts of the farm that require care, such spraying crops to keep pests under control. It only takes 9 minutes to spray one hectare of your crops when you utilize a drone.

Basic Principle - How do drone work?

A drone or quadcopter has four fixed propellers that are oriented vertically. The whole range of motion is made possible by the independent and changeable speeds of each propeller.

The core components of a drone are:

1) Chassis
2) Propellers
3) Motors
4) Electronic Speed Controller (ESC)
5) Flight Controller
6) Radio Receiver
7) Battery



Agricultural applications of drone:

Crop health monitoring:

Throughout the agricultural season, drones may be utilized to monitor crop conditions and conduct prompt, need-based intervention. By using several types of sensors

Based on the reflection pattern at various wavelengths, various multispectral indices for visible, near-infrared, and thermal infrared radiation may be calculated. Crop problems such as water stress, nutritional stress, insect-pest assault, disease, etc. may be evaluated using these indicators. Even before symptoms become apparent, the sensors installed on the drones can detect the prevalence of illnesses or deficiencies. As a result, they are a tool for early illness identification. Drones can be utilized as an early warning system in this fashion.

Weed control:

Unwanted plants called weeds may develop in agricultural crops and cause a number of issues. They are fighting for scarce resources like water and even space, which is a loss in agricultural production and growth. In India, the following crops have yield losses as a result of weeds: vegetables (30–40%), potatoes (20–30%), wheat (10–60%), maize (30–40%), sugarcane (25–50%), and vegetables (10–100%). Herbicides are the method of choice when it comes to controlling weeds. Farmers remove weeds in traditional farming once they have emerged, and the most popular method of controlling weeds is to apply the same quantity of herbicide to the whole field, including the weed-free sections. However, excessive pesticide usage can impact productivity and development by causing weeds to become resistant to the herbicide.

Estimation of ET:

Water is moved from the ground to the atmosphere by evaporation from the soil and transpiration from living things, a process known as evapotranspiration (ET). Professionals in the domains of hydrology, agriculture, and water management employ estimates of potential ET.The estimation of evapotranspiration has emerged as a crucial area of research in agriculture in light of the scarcity of water, population growth, and climate change in recent times. Various unmanned aerial vehicle types are employed for various research objectives in ET estimation. There are three main types of UAV platforms: fixed-wing aircraft, quadcopter, and aircraft. Although aircraft are often costly, they can carry large sensors and fly for longer. Fixed-wing and quadcopter planes are less costly than aircraft. Typically, fixed-wing aircraft may fly for two hours.

Spraying:

For Indian agriculture to reach high productivity levels, production and protection materials were required. Fertilizer and chemicals for agriculture are often required to eradicate insects and prevent the growth of crops. Depending on how differently the crops and field are positioned in space, drones can be used to spray chemicals such as insecticides and fertilizers. Depending on the crop conditions or the intensity of the insect-pest assault, the quantity of chemicals to be sprayed might be changed. The combination of UAV technology and sprayer systems has the potential to offer a platform for vector control and pest management. This is a precise application tailored to the site for sizable agricultural areas. Heavy lifts UAVs are needed for this purpose in order to spray a vast area.

Conclusion:

Drones have the potential to significantly change agriculture in India.

Future technological advancements are anticipated to make drone manufacture more affordable. The arduous labour and tedium associated with farming deters young people from today's society. Drones have the potential to intrigue and inspire young people to pursue careers in agriculture.When it comes to high-quality, real-time aerial images over agricultural areas, drones outperform satellite imagery. Drones may also be used for applications such as weed and disease localization, soil property determination, vegetation detection, and the creation of precise elevation models. Farmers will be able to learn more about their farms thanks to drones. As a result, farmers will receive help in growing more food with fewer pesticides.