

Webinar on revolutionising agriculture through drone technology

A webinar was organised on 16th may 2022 by NAHEP-IDP UHS Bagalkot at zoom platform. Resource persons for the webinar were Ms. Vishnu Priya and Ms. Geethanjali, founder and CEO, Aviana HV. Bioscience Pvt. Ltd, Bangalore. They explained about the importance of drones in agriculture.

Agriculture is the backbone of our country. Agriculture is practices since from many generations in India. Agriculture provides raw materials to industrial sector. Every country GDP depend upon the agriculture of that country. We need to improve the farming sector and make farmers life easier so that it can contribute to overall development of the country. Since from the days the quality of agriculture is decreasing due to non-availability of skilled labour, infusion of technology etc. Farmers are facing many numbers of problems. Now it is the time to infuse technology, artificial intelligence, machine learning, sensor technology all these new kinds of technologies are incorporated into the agriculture to solve the major issues of the farmer. Because agriculture contributes 18 % to the country's GDP.

Main agriculture problems are, labour shortage, skill of the farmers is reducing, soil quality issues, extra use of fertilizers and pesticide application in agriculture. All these can be solved by invasion of drone technology. Global agricultural drone market is growing at the rate of 22.4% (2021-2030). It is expected to reach by 5.89 million US\$ by 2030.

Types of drones used in agriculture

1.Irrigation monitoring: Drones including hyperspectral thermal or multispectral sensors recognize area that are too dry to need improvement by the farmer. Drone survey helps to improve water efficiency and disclose potential pooling/leaks in irrigation by providing irrigation monitoring yields calculations of the vegetation index to help realize the health of crops and emitted heat energy.

2.Crop health monitoring and surveillance: It is crucial to track the health of the vegetation and spot bacterial/ fungal plagues in the early stages. Agriculture drones can see which plants reflect different amounts of green light and near infrared spectroscopy (NIRS) light. This data helps produce multispectral image to track crop health. Quick monitoring and discoveries of any defects can help crops. In circumstance of crop failure, the farmer can also document the damages for accurate insurance claims.

3.Crop damage assessment: Agriculture drones fitted along with multispectral sensors and RGB sensors also detect field areas inflicted by weeds and pests. According to this data, the exact amount of chemical needed to fight these infestations are known and this helps diminish the costs inflicted by the farmer.

4.Field soil analysis: The drone survey allows farmers to obtain information about their lands soil conditions. Multispectral sensors allow seizing data useful for seed planting patterns, through field soil analysis, irrigation and nitrogen level management precise photogrammetry/3D mapping permits farmers to analyse their soil conditions thoroughly.

5.Pesticide/fertilizer spray: Through drone crop spraying human contact with such harmful chemicals is limited. Agriculture drones can carry out this task much quicker than vehicles/airplanes. Drones with RGB sensors and multispectral sensors can precisely identify and treat problematic areas. Professional say that aerial spraying is faster compared to other methods.

6.Livestock tracking: The drone survey allows the farmers not to keep track of their crops only but also monitor the movement of their cattle. Thermal sensor technology helps find lost animals and detect an injury or sickness. Drones can carry out this or sickness. Drones can carry out this function favourably and this adds comprehensively to the production of vegetation.

Drone usage in agriculture:

- 1.Avoid chemical overuse
- 2.Check crop health
- 3.Livestock management
- 4.Soil and field analysis
- 5.Prepare for weather glitches
- 6.Crop spraying
- 7.Geo-fencing
- 8.Crop monitoring
- 9.Monitor growth
10. Plantation

Enhanced production: The farmers can improve production capabilities through comprehensive irrigation planning, adequate monitoring of crop health, increased knowledge about soil health and adaptation to environmental changes.

Effective and adaptive technique: Drone usage results in regular updates to farmers about their crop and helps to develop strengthened farming techniques. They can adapt to weather conditions and allocate resources without any wastage.

Greater safety of farmers: It is safe and more convenient for farmers to use drones to spray pesticides in terrains challenging to reach, infected area, taller crops and power lines. It helps farmers to prevent spraying the crops, which leads to less pollution and chemicals in the soil.

10X faster data for quick decision making: Drone survey back farmers with accurate data processing that encourages them to make quick and mindful decisions without second-guessing, allowing farmers to save the time invested in crop scouting. Various sensors of the drone enable capturing and analysing data from the entire field. The data can focus on problematic areas such as infected crops, moisture level, etc. The drone can be fixed with several sensors for other crops, allowing more accurate and diverse crop management system.

In a major boost to promote precision farming in India, the Union ministry of Agriculture and Farmers Welfare has issued guidelines to make drone technology affordable to the stakeholders of this sector. Government to promote drone use in Agriculture -financial support being extended under sub-mission on agriculture mechanization. Agriculture ministry to provide grant up to Rs. 10 lakhs to agricultural institute for purchase of drones. Custom hiring centres set up by cooperative society of farmers, FPOs and rural entrepreneurs to also get financial assistance for purchase of drones. Subsidized purchase would make drones more accessible to the common man and will encourage domestic drone production.

Government Initiative

- 100% or up to Rs.10 lakhs of grant funding for drone purchase to FMTTIs, ICAR institutions, Krishi Vigyan Kendra and state agriculture universities.
- 75% of grant funding for drone purchase to farmer Produce Organizations (FPOs).
- CHCs/Hi-tech Hubs shall be eligible for availing loan from Agriculture Infrastructure Fund (AIF) for drone purchase.
- 50% or up to Rs. 5 lakhs of grant funding for drone purchase to agriculture graduates establishing custom hiring centres.

Top schemes for start-ups

- **Pradhan Mantri Mudra Yojana**

Pradhan Mantri Mudra Yojana is one of its kind of fund, devised and conceptualized to empower Indian entrepreneurs. Loan up to Rs. 10 lakhs can be availed under the MUDRA scheme

There are three categories of business, which can avail loan under MUDRA loan of start-ups:

Category 1: Shishu, which is for new business. Loans up to Rs.50000 can be availed.

Category 2: Kishor, which is a mid-aged business. Loans up to Rs.5 lakh can be availed.

Category 3: Tarun, which is an existing, experienced business. Loan up to Rs.10 lakh can be availed.

2. Credit Guarantee Trust Fund for Micro & Small enterprises (CGTSME)

CGTSME is one of the biggest start-up loan schemes launched by the ministry of MSME in India. Under this government scheme, a collateral-free loan up to Rs.1 crore is provided to eligible start-ups and MSMEs. The loan is dispersed via a trust named credit Guarantee Fund Trust for micro small enterprises (CGTMSE), which is powered by the ministry of MSME and Small Industries development Bank of India (SIDBI).

3.Credit Linked Capital Subsidy for Technology Upgradation (CLCSS)

Govt is clearly aware that technology is the tool that can propel Indian start-ups and MSMEs to compete with global competitors. This is the reason for the creation of the credit Linked Capital Subsidy for Technology Upgradation (CLCSS) Government scheme, wherein Govt provides financial help to MSMEs to upgrade their technology and implement state of art technological platform for their business.

4. Agriculture infrastructure fund

5. Stand-up India scheme by SBI