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Revolutionizing Agriculture with Drone Didi: The Future of Farming

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Introduction

The world population has increases day by day and projected to reach 9 billion people by 2050, so that the agricultural consumption will also increase. There is extreme need to fulfil the food demand of each and every person. Agriculture sector is the most promising sector, dealing with the lot of problems now a day's one of the main problems is labour unavailability for farming. Other problems or difficulties are extreme weather events, inadequate amount and inefficient application of fertilizer, infection, diseases, allergies and other health problems due to chemical application (fungicide, pesticide, insecticide etc.) or insect/ animal bite. The Use of advanced technologies such as drone in agriculture offer potential for facing several major or minor challenges. Further, Government of India is actively promoting the use of drones in agriculture, especially for crop assessment, digitization of land records, and spraying of insecticides and nutrients.

NAMO Drone Didi Scheme

Hon'ble Prime Minister in his 77th Independence Day address said "We will train women in SHGs to fly drones and also repair drones. The Government of India will provide drones to thousands of Women Self Help Groups (SHG)." Accordingly, a new Central Sector Scheme 'NAMO DRONE DIDI', was conceptualized for providing drones to the women SHGs. The Union Cabinet approved the Scheme with an outlay of Rs. 1261 Crores for the period from 2024-25 to 2025-26.

Objectives of the scheme

- To promote advance technology in agriculture for improved efficiency, enhanced crop yield and reduced cost of operation.
- To empower Women Self Help Groups (SHGs) promoted under DAY – NRLM as drone service providers, since they have emerged as an effective grassroots level institution for collective interventions.

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- To provide business opportunities to Women SHGs promoted under DAY – NRLM to increase their income
- To increase the opportunities for rural employment and financial inclusion.
- To encourage use of Nano-fertilizers and to optimize the use of pesticides and fertilizers.

Some of the key applications of drone in Agriculture include:

1. **Crop Monitoring and Management**: Drones equipped with cameras and sensors can capture high-resolution images of fields, allowing farmers to monitor crop health, detect pests, diseases, and nutrient deficiencies. This data helps farmers make informed decisions about irrigation, fertilization, and pesticide application.
2. **Precision Agriculture**: Drones can be used to create precise maps of fields, including soil variation and crop health maps. This enables farmers to apply resources such as water, fertilizer, and pesticides more efficiently, reducing waste and improving crop yields.
3. **Crop Spraying**: Drones equipped with spraying systems can precisely apply fertilizers, pesticides, and herbicides to crops. This method is more targeted and reduces chemical exposure for workers compared to traditional spraying methods.
4. **Crop Scouting**: Drones can quickly and efficiently scout large areas of farmland, identifying areas of concern such as weed infestations, drainage issues, or crop damage caused by weather events. This allows farmers to respond promptly to potential problems.
5. **Livestock Monitoring**: Drones can be used to monitor livestock, such as counting animals in large pastures or detecting signs of distress or illness. This can help farmers improve herd management and overall animal welfare.
6. **Mapping and Surveying**: Drones equipped with mapping software can create detailed 3D maps of farmland, helping farmers plan field layouts, assess drainage patterns, and monitor changes in topography over time.
7. **Weather and Climate Monitoring**: Drones can collect data on weather conditions such as temperature, humidity, and wind speed at different altitudes, providing valuable information for crop forecasting and disaster preparedness.

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8. **Infrastructure Inspection**: Drones can be used to inspect agricultural infrastructure such as irrigation systems, fences, and buildings, allowing farmers to identify maintenance needs more efficiently and reduce downtime.
9. **Environmental Monitoring**: Drones can assess the environmental impact of agricultural practices, such as soil erosion or water pollution, helping farmers implement sustainable land management strategies.

Major Constraints Impeding Drone in Agriculture

1. **Regulatory Hurdles**: As mentioned earlier, navigating regulations surrounding drone usage in agriculture can be challenging and time-consuming. This includes obtaining permits, adhering to flight restrictions, and ensuring compliance with privacy laws.
2. **Cost**: Drones themselves can be expensive, and when you factor in the cost of necessary equipment (sensors, cameras, etc.), software, maintenance, and training, the overall investment can be significant. This can be a major barrier for small-scale farmers or those operating on tight budgets.
3. **Limited Flight Time and Range**: Most drones have limited battery life, restricting the amount of time they can spend in the air per flight. This can be problematic for covering large areas of farmland efficiently, especially when multiple flights are required to complete a task.
4. **Payload Capacity**: Drones have limited payload capacities, meaning they can only carry a certain amount of weight. This limits the types of sensors or equipment they can carry, potentially impacting their effectiveness for certain agricultural tasks.
5. **Data Management and Analysis**: Collecting data with drones is just the first step; processing and analyzing that data can be complex and time-consuming. Many farmers may lack the expertise or resources to effectively manage and interpret the data collected by drones.
6. **Weather Conditions**: Adverse weather conditions such as high winds, rain, or fog can limit the usability of drones and affect their ability to collect accurate data. This can lead to delays and disruptions in agricultural operations.
7. **Skills and Training**: Operating drones effectively requires training and expertise, both in piloting the drone itself and in managing the data collected. Many farmers may lack these skills or may be hesitant to invest time and resources in training.

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8. **Security Concerns**: There are concerns about the potential misuse of drone technology, including unauthorized surveillance and data breaches. Farmers need to implement security measures to protect their data and ensure compliance with privacy regulations.

Way Forward

The future prospects of drone technology are vast and promising, especially in sectors like agriculture, infrastructure, logistics, and public safety. In addition to precision agriculture, drones can be useful in livestock monitoring, disaster response and relief, medical supply delivery, especially in remote or inaccessible areas, monitor forest cover, wildlife habitats, and water bodies, aiding in biodiversity conservation and ecosystem management. By embracing drone technology and leveraging it for various applications, women in rural India can enhance their livelihoods, contribute to community development, and participate more actively in the socio-economic growth of their regions. Access to training, resources, and supportive policies will be crucial in enabling women to harness the full potential of drones for their benefit and that of their communities. Thus, scheme will promote economic empowerment and financial autonomy among women, showcase technological advancements in agriculture through drone demonstrations, and will provide financial support to SHGs for their upliftment.

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