



Kisan Drone and its Simplify Guide of the New Drone Rules 2021

Dr. Parmar Raghuvirsinh P¹ and Er. Gurpreet Singh²

¹Scientist (Precision Agriculture), R & D Department, T& D Electronic Systems, Ludhiana (PB)

²SRF, Department of Agricultural Engineering, College of Agriculture, CSK Himachal Pradesh Agricultural University, Palampur (HP)

INTRODUCTION

Drones are also called Unmanned Aerial Vehicles (UAVs) which have been trading since around the early 1980s. However, the use of drones has never gained much popularity as it has nowadays. From then to the present time, drone solutions started their way and now the benefits of drones are giving a tremendous assist. Drones are the ground-breaking latest technologies shaking up the each and every sector of business-like agriculture. This is looking to give the agricultural industry, a big technological makeover with proper planning and pouting based on real time data collecting and processing.

Over the past decades, the topic of agriculture drones has attracted remarkable academy attention. The selection of correct drone for your agricultural operation needs can deliver unmatched benefits in terms of precision agriculture, data and monitoring, general monitoring, day-to-day agricultural tasks like as pesticides, herbicides, weedicides

and fertilizers. Then you might be wanted to streamline the operations of agriculture through drones just like crop spraying or else, you may be achieving better image of your farm land. Drones in agriculture, provides new apparatus for monitoring and managing of soils as well as irrigation. It moreover speeds up the gathering of information on crops, among other uses that we will discuss below with brief detail.

USES OF DRONES IN AGRICULTURE:

1. Crop Monitoring
2. Health Assessment
3. Estimating Soil Condition
4. Spray Planning
5. Crop Spraying
6. Pollination
7. Livestock managements
8. Farmers life



DRONE –AS – A– SERVICE (DAAS)

Drones are used in a wide range of sectors in India including agriculture, security and surveillance, aerial photography and videography, navigation, infrastructure solutions for roads and highways including transportation management in high density urban zones, construction support, telecom services, LiDAR in mining, watershed management and monitoring emergency/

disaster situations. In the 2022 budget, the Finance Minister of India stated that “There is a need to introduce the Kisan Drone as a service model in India especially in relation to the agriculture sector. It will include the use of drones in spraying of insecticides, pesticides, and nutrients etc, digitize land records and to monitor the crop health.

DRONE RULE AND GUIDLINES BY GOVERNMENT

The new drone rule 2021 was came in enforced on 26th August, 2021 by the Ministry of Civil Aviation, Government of India and was amended by the Drone (Amendment) Rules, 2022 on 15th February, 2022. The drone rules have a potential to rise the India as a global drone hub in the future and will boost the morale of the Indian drone manufactures and government organizations. Regulations for the owning and operating drones in India as explained below:

• Registration and Licensing:

All drones must be registered with the Directorate General of Civil Aviation (DGCA), and operators must have a drone pilot license to fly them. Drone and certified drone pilot license registrations can be done on the Digital Sky platform operated by the DGCA which provides a single-window online platform for drone registrations and approvals related to drone operations.

As per the Drone Rules 2021, every new drone

needs to be registered with the digital sky platform and have a Unique Identification Number (UIN). A person owning an existing drone imported or manufactured before 31st December 2021 needs to self-register and generate the UIN which can be conveniently done online on the aforementioned platform.

• Drone Pilot Certification Requirements:

Drone operators must be over 18 years of age, have completed a training course from a DGCA authorized Remote Pilot Training Organizations (RPTOs) institution, and pass a written exam. Once the drone operation license is issued, it is valid for 10 years. No pilot certificate is required for operating Nano drones and non-commercial micro drones.

• Restrictions on Use:

There are restrictions on where and when operators can fly drones. For example, operators cannot fly near airports or in densely populated areas.

INTERACTIVE AIRSPACE MAPS

The Indian Ministry of Civil Aviation (MoCA) has also deployed an interactive airspace map on the Digital Sky Platform for the convenience of drone operators and all other stakeholders. The map is color-coded into green, yellow and red zones.

While no permission is required to fly drones in the green zones, yellow zones are controlled airspace and need special permission to enter. Red zones are strictly no-fly zones. Red zones include areas such as military bases or nuclear power plants and other sensitive areas are restricted due to the risk of accidents or national security purposes. Drone pilot should not fly Nano and micro drones over 50 ft. above ground level and above a speed of 25 m/s.



Figure 1: Digital Sky Map for an Interactive Airspace Map for Drone Flying

NO PERMISSION – NO TAKE-OFF

In India, before every operation of a drone, permission is mandatory. Drone operators can see permission via digital sky platform which automatically grants or rejects the permission. The specifications of drones permitted for use in India require them to be incapable of take-off without permission. Operators of drones must ensure that they comply with all these restrictions. Failure to do so could result in penalties, including a fine of up to INR 1,00,000.

Drones are becoming increasingly popular for both recreational and commercial purposes all over the world. In India, the publication of the Drone Rules, 2021 and the Drone (Amendment) Rules, 2021 make the operation of drones simpler than ever before. Along with the notification of these Rules, a ban on the import of drones seeks to push the Indian manufacturing sector to rapidly assimilate technology to cater to the needs of the Indian market. The Indian government's ambitious goal of becoming a global drone hub by 2030 is supported by new regulations and rules. It is crucial to be familiar with these rules and regulations before operating a drone in India.

CATEGORIES AS PER DRONE RULES

A. On the basis of Size: The five main categories of drones on the basis of size and weight carrying capacity.

1. **Nano Drones:** Carry upto 250 gm weight.
2. **Micro Drones:** Carry more than 250 gm upto 2 kg weight.
3. **Small Drones:** Carry more than 2 kg up to 25 kg weight.
4. **Medium Drones:** Carry more than 25 kg up to 150 kg weight and not allowed for the agriculture as well as commercial use.
5. **Large Drones:** Carry more than 150 kg weight.

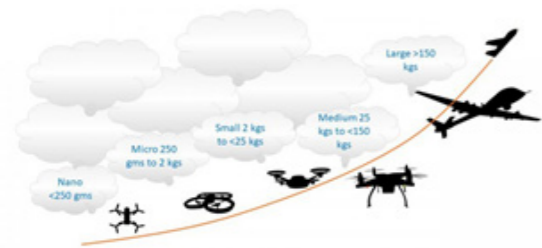


Figure 2: Classifications of drones on the basis of size as per DGCA rules

In India, nano, micro and small drones are allowed for commercial as well as agriculture practices.

B. On the basis of Rotor: The three main categories of drones on the basis of rotor.

1. Single rotor drones
2. Multi-rotor drones
3. Fixed rotor drones
4. Hybrid fixed-wing vertical lift rotors drones

C. On the basis of Range:

1. Short ranges
2. Mid range
3. Close range



HOW TO OPERATE AND CONTROL A DRONE

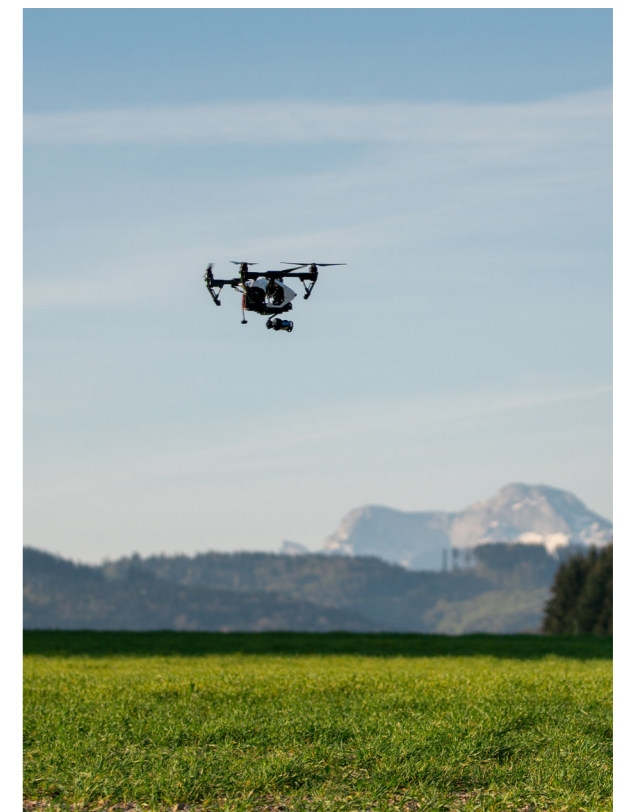
When learning how to fly a drone, the controls will become second nature once you know how they operate and interact together to form a complete flying experience. When you first start out, push the sticks very gently so the drone performs slight movements. As you get more comfortable, you can make sharper movements.

There are four main drone controls:

- **Roll:** Done by pushing the right stick to the left or right. Literally rolls the drone, which maneuvers the drone left or right.
- **Pitch:** Done by pushing the right stick forwards or backward. Tilts the drone, which maneuvers the drone forwards or backward.
- **Yaw:** Done by pushing the left stick to the left or to the right. Rotates the drone left or right. Points the front of the copter in different directions and helps with changing directions while flying.
- **Throttle:** To increase, push the left stick forwards. To decrease, pull the left stick backward. This adjusts the altitude, or height, of the drone.

Going through a pre-flight checklist will keep you and your drone safe. Following is a checklist can be use before each flight:

1. Weather & Site Safety Check
2. Visual Aircraft / System Inspection
3. Powering Up
4. Taking Off



LIMITATIONS

There are some limitations with this technology in the field of agriculture:

1. Required Skilled Workers
2. Knowledge of Drones and Software's
3. Weather Dependency
4. Battery dependent
5. Short Time of Flights
6. Highly expensive

