

## **SOP for AGRICULTURAL USE OF DRONES/UAVs**

**A. How it Works.** A UAV (Unmanned Air vehicle)/Drone consists of a small unmanned aircraft. Associated elements that are necessary for the safe and efficient operation of the aircraft include the interface that is used to control the UAV, also known as a control station, and communication links between the control station and the UAV.

**B. Applied Uses in Agriculture.** Agricultural use was the reason drones were initially developed and still has the potential to be the biggest market. The ability to use drones in precision farming, crop health analysis, monitoring livestock, and other agricultural uses has been deemed a “game changer” by one precision agriculture expert. Farmers and ranchers in numerous other countries are using drones, putting Pakistani farmers at a technological disadvantage. Drone/UAV technology can be usefully deployed in the following agriculture sub-sectors:

- (a) Applications of pesticides on crops;
- (b) Monitoring of weeds, pests, and nutritional deficiencies;
- (c) Geographical survey of crops, area and water resources
- (d) Research and development.

Needs for progressive farming have changed in this era. Precision or Site-Specific Agriculture practices considers Right input at the Right time at the Right place at the Right rate. It requires:

- a) Map the field yield variability in order to determine best.
- b) Strategy for optimum fertilizer usage.
- c) Monitor the health, nutrient and water of crops at every few centimeters in order to identify low yield areas.
- d) Chemical applications (Pesticide)
- e) Crop and Livestock inventory management

The solution for all the practices lies in an Eye in the Sky i.e. Use of drones / UAVs. Benefits of using this technology as compared to other technologies is very prominent.

<b>Satellite</b>	<b>Airborne Radar</b>	<b>Drone / UAV</b>
<ul style="list-style-type: none"> <li>• Global Coverage (Large Scale)</li> <li>• Low Spatial Resolution (0.3 m)</li> <li>• Cloud Cover</li> <li>• Low Temporal Resolution</li> <li>• Higher cost of operation</li> </ul>	<ul style="list-style-type: none"> <li>• Regional Coverage (Medium Scale)</li> <li>• Medium Spatial Resolution (0.1 m)</li> <li>• On Request</li> <li>• Medium cost of operation</li> </ul>	<ul style="list-style-type: none"> <li>• Local Coverage (Small Scale)</li> <li>• Very High Spatial Resolution (0.05 m)</li> <li>• All-Time Ready (Repeatability)</li> <li>• Lower cost of operation</li> </ul>

Drones are very useful in determining land level problems which can then be alarmed to farmer for possible rectification. Recent experiments done in this regard by Lahore University of Management Sciences have validated this.

### **C. Obtaining Permission for Operating Drone/UAV for Agriculture Purposes**

(1) A person can apply to the Deputy Director Extension, Agriculture Department in his District for authorization for the use of UAVs (unmanned aerial vehicles) or drones for the sole purpose of:

- (a) application of pesticides on crops;
- (b) monitoring of weeds, pests, nutritional deficiencies;
- (c) geographical survey of crops, area and water resources; and
- (d) research and development.

Provided that the particular purpose(s) from the aforementioned list should be clearly mentioned in the application.

(2) The concerned Deputy Director Extension, Agriculture Department shall refer all cases / applications about the use of drones for the aforementioned agriculture uses to the DIC (comprised of DC/ DPO).

(3) After proper analysis and vetting, an NOC may be granted by the DIC to the applicant specifying therein the area, time and duration of use of Drones. In arriving at a decision, the protocols about the security of sensitive installations / establishments shall be given due consideration. A police personnel may also be attached with the operator of drone at the time of flying activity.

(4) The concerned Deputy Director Extension, Agriculture Department shall inform the applicant in a timely manner about the status and outcome of the application for NOC regarding permissible agriculture use of drone/UAV and the attached conditions.