Unmanned Arial Vehicles (UAV) in Smart Agriculture: Trends, Benefits and Future Perspectives

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There is an improved concern in precision farming and the development of smart systems for agricultural resources management aims to increase the agricultural productivity, optimize the profitability, and protect the environment. Data collection, field variability mapping, decision making, and management practices are the foremost stages of smart agriculture. Self-directed aircrafts are sophisticated cost effective instruments for data acquisition, real time thermal images to the Ground Control Station (GCS), and the best medium for quick time and critical analysis of the crop growth. Unmanned Arial Vehicles (UAVs), especially drones, can fly autonomously with dedicated software which allows making a flight plan and deploying the system with Global Positioning System (GPS) and feed in different parameters such as speed, altitude, Region of Interest (ROI). These features are required in smart agriculture where large areas are monitored and analyses are carried out in minimum time with miniaturization of compact cameras and other sensors like infrared and sonar. UAVs are presently being functional by farmers in extensive field analysis of crop behavior such as rice, maize and wheat where they scan through the field, take images and report abnormality. The collection and delivery of images in a timely manner, the lack of high spatial resolution data, image interpretation and data extraction issues are the major limitations identified in the applications of remote sensing systems in agriculture. Nevertheless the future of agriculture is clear with drones as a precious tool that will amplify profitability and healthy crop production. Further, it has been predicted that the agriculture sector will be the second largest user of drones in the world in the next five years. Research priorities and future challenges that will support in the development of effective use of UAV in agriculture with multi-prong strategies were discussed.

Keywords: Drones, Global positioning system, Remote sensing, Smart agriculture