DRONE TECHNOLOGY: DIGITAL HAWK EYE IN THE SKY FOR PRECISION AGRICULTURE

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ABSTRACT

In agriculture, farmers have always needed accurate and up-to-date information on the health of their crops and the environmental condition of the land. In India, most of public depend on agriculture field but due to high field area difficult to visit each place and government also cannot get correct information at time. Now a days, technology has infiltrated in our lives through social media, smartphones, computers and the internet, agriculture has remained the last bastion of tradition as an enterprise of human labour and intellect. Even though computerisation, much of farming involves human labour and legwork. Farmers walk down their fields checking for plant health, the presence of weeds, pets and bugs, parched soil and other overt signs of suffering. However, even with an expert eye, it is often hard to notice diminished photosynthesis or signs of pathogen infestation early enough to avoid large losses. This, in turn, has led to a culture of prevention where farmers have resorted to the excessive use of water, fertilisers, pesticides, etc. Otherwise, the cost of non-intervention, or even late intervention, is massive crop failure. This paper presents the SWOT analysis of the latest buzz – Agriculture Drone. Drone Technology or Unmanned Aerial Vehicles (UAV) will give the agriculture industry a high-technology makeover, with planning and strategy based on real-time data gathering and processing. Agricultural drones are becoming a new latest digital tool like any other consumer device in agriculture to for holistic agricultural development.

Keywords: *drone technology, precision agriculture*

INTRODUCTION

Unmanned aircraft are referred to in many different ways. The word “drone” originates from the military, but is now widely used to describe civilian technologies. Drone technology could help farmers around the world monitor their crops, fend off pests, improve land tenure, and more. But to realise its full potential, regulatory regimes are necessary, while keeping citizens’ safety and privacy rights secure. (Ghodasara et al.,2016)

A growing market

The international UAV market has grown considerably in the past few years, building on their demonstrated usefulness to agriculturalists and others. An August 2015 study from Grand View Research estimated the global commercial drone market size to be $552 million in 2014 – and its grow to $2.07 billion by 2022, with agriculture dominating other drone sectors.

Strengths

(1) Portability

Nowadays drone are use in all filed including agriculture also because the ease of use, low cost and less time with more productivity which change the agriculture scenario. Drone technology more usefull in agriculture which enhance the product quality as well as quantity also and nowadays labour can not easy avilable so it is more suitable option for large farmers.

(2) Low cost of operation

Due to larger area of field some data collection, crop monitoring, avilability of time and labour problems are there. So, using of this drone technology which less time, less labour, instan data analysis and crop monitoring which low cost as well as also reduce the future or present problem which are going during the observation of field just like weed problem. We can instant solve problem using this technology.

(3) Ease of Use

Drone can work very ease. Farmers are not educated but the system of drone which require some techniques so farmers can operate this drone machine simple like mobile operating. So, drone can not required more education for operating of that machine only simple trainning require for the operation.

(4) Automation of analysis

Use of automation technology with drone system which less time require for the analysis of data because within less time drone cover the all area and analysis of stastical very easy using software. Mostly farmers not awre of calculation so use of automation which more help to farmers.

(5) Productivity

Field is very vast so the use of drone which increase production by several ways like crop monitoring, irrigation, cattle herd information, natural disater as well as other information which helps in productivity.

Weaknesses

(1) Initial investment forFarmers

Drone technology require some machine tools which normally higher cost e.g. camera, motor, GPS etc. So, intial cost of these all part which high. This is the main problem for small farmer but the larger farmer can effort this machine.

(2) Requires good signal strength of network

Drone technology require some GPS system and wirless network for controlling and data tranformation so the each and every place and signal capacity of machine which factor affect the efficiency.Drone image quality is highly dependent on environmental conditions at the time of flight and the camera settings used to address them.

(3) Data overflow

Drones are use for survey also but the probloem are the less stroage capacity of data some time due to higher data collection either old membry which delet or new memory can not save by drone so, perodical save the drone data and delet interval time so drone can not over flow of data.

(4) Requires power

Drones is work based on electrical power supply. So avilabilty of power in field for charge of this drone battry so drone can work properlly it must be require. If power is not avilable so drone can not work. It is main weakness of drone technology because this full automation based system which opertate by computer or remote.

(5) Flight regulations arenot advanced

Nowadays drone automation not develop properlly so it can not regulate up to long distance with high accuracy of data collection so, it is weakness of flight regulationare not advanced as much as needed.

Oppertunities

(1) Enhance the quality and productivity

Use of the drones for agriculture which do lots of opertion like crop monitoring, disater, bacterial attack as well as cattle herd attack, weed problem all these parameter control by less time with maximum area so prduct quality increase with productivity.

(2) Increase the farmers' income

Use of drone technology which can reduce the labour cost because nowadaysa labour cost is very high due to less avilability and less fertility dose also reduce cost of fertiliser and inncrease production with better quality which increase farmers income more.

(3) Developing new research in agriculture

Drone technology is new in agriculture field so, farmer can not see micro level of insect in crop but the HD camera can observe more micro insect side compaire to humune so drone technology is new developing research in agriculture.

(4) Increase public safety

It's essential to assess crop health and spot bacterial or fungal infections on trees. By scanning a crop using both visible and near-infrared light, drone-carried devices can identify which plants reflect different amounts of green light and NIR light. This information can produce multispectral images that track changes in plants and indicate their health.

(5) Reduce health and safety risk for human

Drone imagery can also be used to better understand the spread of disease, allowing health analysts to create high quality maps.

(6) Fast and accurate output

Drone technology mostly use for government data collection of agriculture crops so, within time drone cover the all area and government got fast and accurate output with lattest high speed drone with HD camera which helps in fast, longer wirless network and accurate reading give to the government for proper collection of information.

Threats

(1) Violation of human rights

Drones are fly over the field so, withot other permession drones enter any field so it create the violation atmoshpere and breake the humun rights.

(2) Hacking into software

Government data of production and analysis that data hack by some other user which can hack the software so govermnet can get wrong data collection and survey the lend infrormation.

(3) Regulatory issues

Each country have their regulation of drone technology use so without government permission we can not use of drone for our application. Government make some regulation for drones technology which must require because other wise miss use that data by other person which make wrong atomospher just like terrirest attack.

(4) Public availability – Do it yourself drones can be created for criminal purposes

Just like any tool, yes it could be abused and used to do wrong. We need to ensure that there is transparency and accountability with the people that use this technology.

CONCLUSION

Agricultural drones are becoming a tool like any other consumer device, and we're starting to talk about what we can do with them. Using drone we wants to irrigate less, use less pesticide, and ultimately produce better productions in agriculture and allied field. More and better data can reduce water use and lower the chemical load in our environment and our food. Seen this way, what started as a military technology may end up better known as a green-tech tool, and our children will grow up used to flying robots buzzing over farms like tiny crop dusters. As every coin has two sides, use of drone technologydoes have some issues which can definitely be overcomed for the betterment of the farmers in particular and the nation as a whole.

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