

## Design & Fabrication of Agro Spraying Drone

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**Abstract**— The present study describes the design and fabrication of agro spraying drone which is a main source of income in India is agriculture. The production rate of crops in agriculture is based on different parameters like temperature, humidity, rain, etc. Which are natural aspect and not in farmers control. The field of agriculture is also depends on some of aspect like pests, disease, fertilizers, etc. which can be control by giving proper action towards crops. Pesticides may increase the efficiency of crops but it also effects on human health. So the main focus of this project is to design agriculture (UAV) for spraying pesticides. The use of pesticides in agriculture is very much important to agriculture and it will be simple if we use intelligent machines such as drone using new technologies. This paper gives the idea about drone used to reduce human efforts in various operations of agriculture like spraying of UREA, fertilizers, etc. This paper explain the development of hexa copter UAV and the spraying mechanism. In this paper we also discuss combination of sprayer module to hexa copter system. The discussed system involves designing a prototype which uses simple cost productive equipment like BLDC motor, Arduino, ESC wires, carbon fibar blade, etc.

**Keywords:** UAV-Unmanned Aerial Vehicle Use in Sprykling Purpose

### I. INTRODUCTION

The objective of agro spraying drone to improve the productivity and efficiency of agriculture by providing safe cultivation of the farmer the various operation like of sprinkling of pesticide and sprinkling fertilizer are very important .though spraying pesticide has become inescapable it also proves to be a harmful procedure for the farmer. Farmer especially when they spray urea take to many provisions like wearing appropriate outfit masks and gloves it will keep away any harmful consequence on the farmers .staying away from the pesticide is also not completely possible as the required result has to be met. Hence for this type of problem along with the necessary productivity and efficiency of product.

#### A. Types of Pesticide

- 1) INSECTICIDES: INSECT
- 2) HERBICIDE: PLANT
- 3) RODENTICIDES: RODENT|(RATS&MICE)
- 4) BACTERICIDE: BACTERIA
- 5) FUNGICIDES: FUNGI
- 6) LARVICIDE: LARVA E

#### B. Figure Old Spraye Bacpack Lever Hand Knapsack Spray



Fig. 1: Manual Spreyar

### II. PROBLEM IDENTIFICATION

The Knapsack Sprey Use In Famer It Consist Of Pump Large Large Air Chamber Mounted In A 5-9 Tank Use To Spreying Tree Shrubs And Row Crops Weight Of Tank Is More And It's Harmful In Human Body There Directly Impact On Human Body It's Present Condition

#### A. Solution

Our Design The Agro Spreying Drone To Reduce Costs On Human Labour To Increase Efficiency With The 10-20 Litter Liquid Tank That Is 50 Times Faster Than The Traditional Tool It's Use High Performance Application Even After Rain In Wait Soil Lower Impact On The Enviroment The Agriculture Drone Is Powerd 100% By Electricity Can Save To 90%Water And 35% Pesticide It's Small Droplet Diameter Make The Chemical More Well Distribute And Improve The Effect

### III. DESIGN METHODOLOGY

Fight Controller Is Main Board In The Uav Is Embedded With The Most Advanced Firmwark And Responsible For The Actual Flight .Fight Controller Lot Of Things Simultaneously During The Fight Or Uav It Built With A Micro Controller And Communicates To The Six Brushless Motor. Bldc Motor Connect With The Rotor In Direction Of Uav Controller By The Radio Channel Transmitter And Receiver .Ever Rc Transmitter Have Number Of Channels For Individual Activity To Controll The Uav A Sample Block Diagram Shown An Fig.2

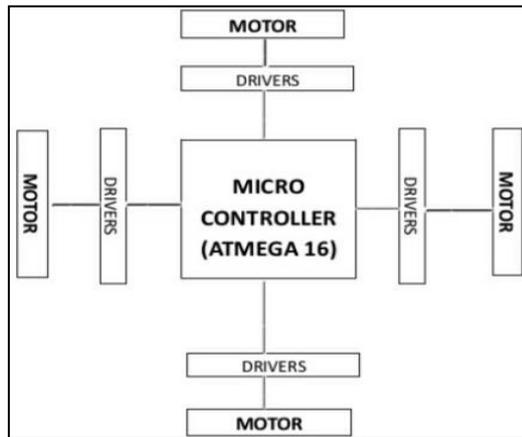


Fig. 2: Block Diagram of Model UAV

#### A. Design Parameters & Reading

- Input Parameter
- 1) weight Of Drone= 2 Kg
- 2) weight Of Drone With Tank=4kg
- 3) battery Capacity= 6600mah
- 4) Voltage Of Battery =14.8v-16.8v
- 5) thrust Per Motor At 50% =1 Kg
- Output parameter
- 1) length =500mm
- 2) width =415mm
- 3) height=320mm
- 4) top width =145mm
- 5) diagonal wheelbase= 800mm
- 6) frame arm length= 350mm
- 7) centre frame diameter= 240mm

Fig no-3 show top view side view and front view of drone

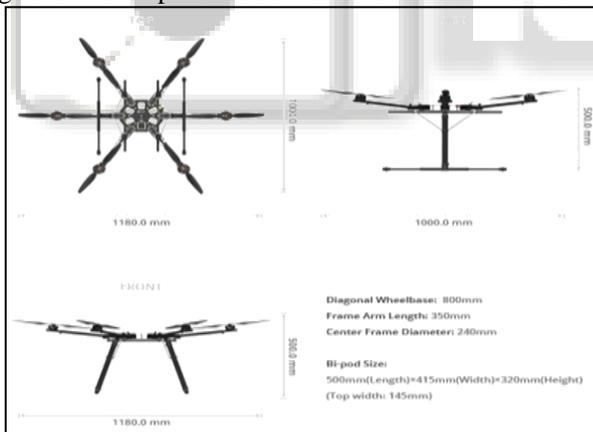


Fig. 3: View of Drone

#### B. Original Model of Drone



Fig. 4: Model of Drone

#### IV. WORKING OF DRONE

The 6 propellers of a drone or hexa copter are fixed and vertically orientated. Each propeller has a varying and independent speed which allows a full range of movements. An UAV also known as “Unmanned aerial vehicle” has nozzles in-built in it so that spraying is done efficiently as well as accurately according to given commands. UAV involves 6 motors which supply equal and opposite thrust on the ground so that the UAV may lift off in air. This is newton’s third law of motion i.e. every action has an equal and opposite action.

A typical unmanned aircraft is made of light light complex materials to lower weight and strengthen maneuverability. Complicated material strength permits UAV to cruise at very high altitudes. Drones are equipped with totally different state of the art technology like an infrared cameras, GPS and optical device (consumer, industrial and military UAV). Drones are guided by remote ground control systems (GSC) and additionally known as a ground cockpit. A pilotless aerial vehicle system has two elements, the drone itself and the control system. The nose of the unmanned aerial drone is where navigational systems are present. The rest of the body is packed with drone technology systems since there is no area needed to accommodate humans. The engineering materials used to build the drone are extremely complex composites designed to soak up vibration, which decrease the sound made. These materials are very light weigh

#### V. LITERATURE REVIEW

- It provide the information about the aerial vechile and construction, data. <https://www.airboard.co/agriculture-drone/>,
- Walter, R. Finger, R. Huber, N. Buchmann Opinion: smart farming is key to developing sustainable agriculture
- RuedaAyala, V.P., Peña, J.M., Höglind, M., Bengochea-Guevara, J.M., Andújar, D., 2019. Comparing UAV-based technologies and RGB Dreconstruction methods for plan the ight and biomass monitoring on grassley. Sensors 19, 1–1 Suggest the precautions, how to increase output and data.

#### VI. CONCLUSION

After studying the above paper, we study that agro spraying drone are much better designed and construction and are more accurate than conventional method. Drone is the future of agriculture and other industry. We used better technology to reduce cost and to increase efficiency, so this can available in affordable price for famers.

#### REFERENCES

- [1] [www.google.com](http://www.google.com)
- [2] [www.wikipedia.co](http://www.wikipedia.co)  
<http://www.digitaltrends.com/wpatest-military-drones-are-scary-header.jpg>