DROZA

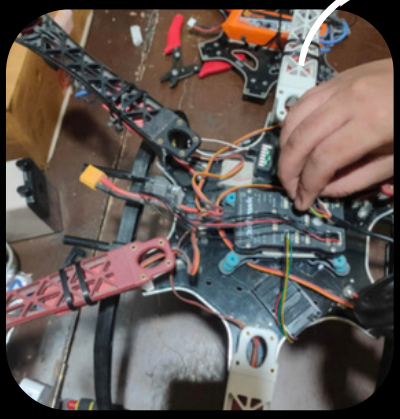
Realising the problem

We came to this idea while making a farmer's organization called Farm 1 which aimed to improve the deals which farmers received from the market by form a cooperative group.We realised that most of the farmers in our community also faced health issues such as respitory illness and back pain. We realised that this is a century long problem as farmers use pesticide sprayers which are heavy and also a way to inhale harmful chemicals directly.
Solutions to these problems do exist in the market but are out of reach for many indian farmers. Also learning to use these solutions are similar to learn.
To address these problems we came up with droza.

Solution

To address these problems we came up with droza: a drone service which provides pesticide spraying and manure dropping via drones to farmers. Our drones are AI enabled which means it requires no human input other than turning it on or off and setting the path.
Drones with these advances available in the market usually start from 5 lakh rupees which is out of reach for many farmers. That's why we use self made drones in our operation which are built for only 45000. Also we do not sell these drones rather we provide service to the farmers at just 70 rupees per 2.5 acres.

The Build



Technical Details

Droza uses Ardupilot's Autopilot along with some local farm data such as height of the crop and the direction of wind to do the operations. The drones in our fleet use pixhawk flight controller along with telemetry module and GPS for the navigation which provides a 5 km range. We use 2 different mechnisms for different purposes in the farm. For spraying we use a DC water pump attached to a 4 litre box made with recyclable plastic bottles and for dropping manure we use a drop mechanism which uses a motor attached to slit which acts as opening to the box filled with manure. Both of these mechanisms can be controlled by the blynk app which is available on the volunteer's smartphone.

The operation

Droza as of now has 3 fully automated drones in its fleet.The drones are kept at our place. We take slots from farmers from Monday to friday either through a call or our website Once the slots are booked we assign our volunteers who are either from the lions club or the red cross. The volunteers take the drones to the respective farms and then set the drone's trajectory. The drone has a swap battery mechanism which means no charging on the farm. With one battery a drone can spray about 2.5 acres of farmland. Usually our volunteers take 4-5 batteries with them which is enough for a day's operation.

Path being set by the volunteer

The drone takes off

How Do Volunteers Control the drone?

The volunteers use no form of remote controller rather they use a simpler version of Q ground control mobile app with a telemetry module that is unique to every drone. The telemetry module can be attached to any android smartphone. They set the path for drone as shown in the video and then the drone follows the path.

Our Collaborations

Droza is a social organisation and has no intentions to make any money in the agricultural field. Our revenue is entirely spent on developing new technologies for the drone such as our latest package drop device and the the very first sprayer. We have been actively collaborating with local NGOs such as the redcross and lions club to create a network of volunteers who help in our operations. During the peak time of COVID 19, droza collaborated with max hospital to spray sanitizer in public placesWe have also collaborated with local organic manure sellers to encourage organic farming in our community.

Design and dimension

The diameter of the drone is 550mm without propellers. The drone has an adjustable height - 100mm - 220mm.

Comparison

	Manual labour	Other Option*	Droza
Cost	INR 3200	INR 8000	INR 700
Time Taken	3-4 days	2 hours	3-5 hours
Control	Manual	Manual (RC Pilot)	Automatic

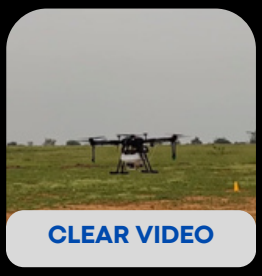
How 70 rupees

We spray pesticides at 70 rupees per 2.5 acres. The cost of the pesticide is a separate entities. We charge 70 rupees as our service fee and the pesticide belongs to the farmers themselves.

Capex of drone INR 45000

Service Fee	70
Digital Fee	-5
Electricity Fee	-10
Partner Fee**	0
Logistics	-20
Net Profit	35

#IMPACT


CLEAR VIDEO


Full explanation


VISIT WEBSITE

Future Prospects

We have developed our own package deliver system which can deliver essentials within 7 minutes in a 2 km radius. We call the entire mechanism incity.

Expand droza to other states and collaborate with local panchayats for a community owned drone.

Space - Launching small satellites with the help of drones and balloons. Progress - Reseach on Balloon inflation completed

* Available drone service in India

** There is no Partner fee yet. We have created a group of volunteers who charge nothing from us.