



DHAKSHA UNMANNED SYSTEMS PRIVATE LIMITED
INDIA'S FIRST PETROL-ENGINE BASED SPRAYER DRONE

RAJA RAMAN
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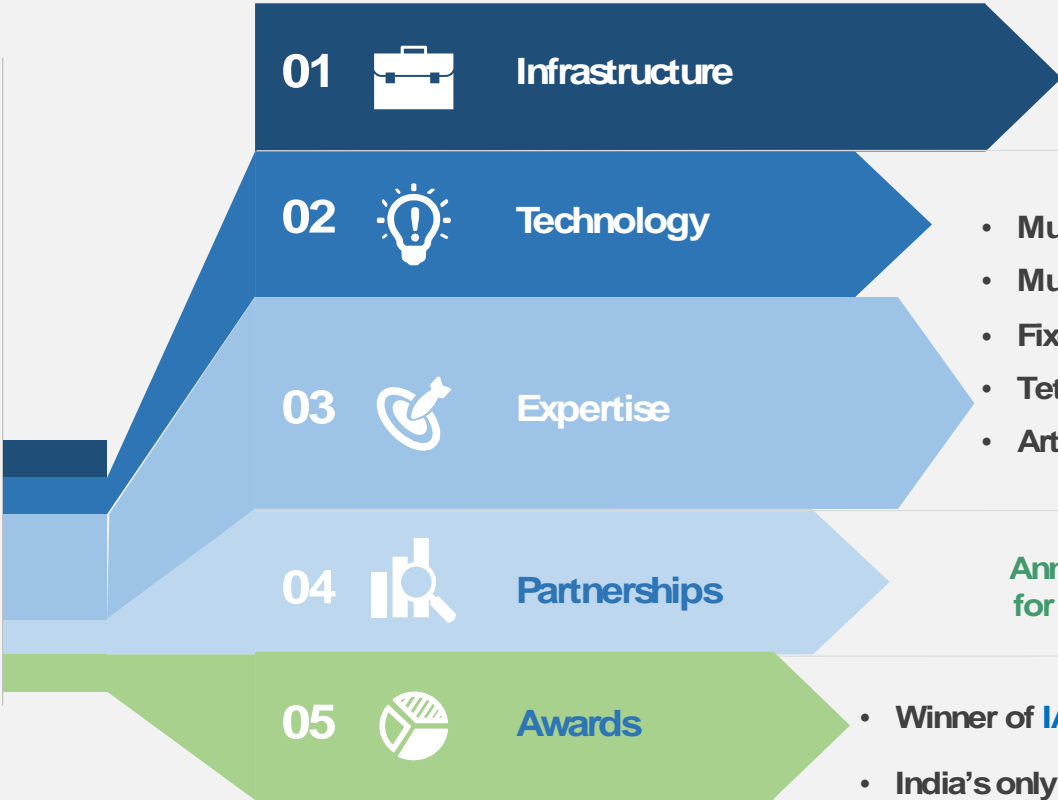
ABOUT DHAKSHA Incorporated Apr. 2019 • Location: Chennai, India

India's Preeminent Manufacturer of Drones for:

1 Agriculture Spray Drones

2 Drones for Defence & Ent.

3 Drone Pilot Training



- 15,000 SF State-of-the-art Manufacturing Plant (Chennai)
- 5000 SF Drone Software & AI Center (Chennai)
- 70 Acre Drone Testing Grounds (Chennai)

- Multi-rotor Battery Drones
- Multi-rotor Petrol-Engine Drones
- Fixed Wing VTOLs
- Tethered Drones
- Artificial Intelligence

Anna University for Drone R&D Honeywell for BVLOS

- Winner of IAF Mehar Baba Swarm Drone Competition against 154 Cos.
- India's only company to offer Petrol-Engine based Agri drones
- One of India's first companies to fly at 18,000' in Ladak-Leh.
- BVLOS – One of the few consortiums approved by DGCA.
- First time in India to perform 75 kms range with live HD video feeds.

<p>DIPP CERTIFIED STARTUP INDIA COMPANY</p> <p>#startupindia</p> <p>DEPARTMENT OF INDUSTRIAL POLICY & PROMOTION</p>	<p>DGCA CERTIFIED DRONES</p> <p>DGCA CERTIFIED DRONE R&D ORGANIZATION</p> <p>DIRECTORATE GENERAL OF CIVIL AVIATION</p>	<p>CERTIFIED MSME ORGANIZATION</p> <p>MINISTRY OF MICRO, SMALL MEDIUM ENTERPRISES</p>	<p>COMMITTED TO MAKING IN INDIA</p> <p>MAKE IN INDIA INITIATIVE</p>
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LEADERSHIP AT DHAKSHA



N. RAMANATHAN
DIRECTOR & CHIEF EXECUTIVE OFFICER

RESPONSIBILITY
P&L, Strategy, Production

EXPERIENCE
32 years experience

FUNCTIONS
Overall Growth
Strategy & Execution
Investor Relations and Legal

EXPERIENCE
Manufacturing at TVS-Harita
Manufacturing at TOYOTA India
Has been CEO of companies previously

EDUCATION
BE – Mechanical



Dr. KRISHNA KUMAR, Ph.D.
CHIEF TECHNOLOGY OFFICER

RESPONSIBILITY
UAV R&D and NPD

EXPERIENCE
20 years experience

FUNCTIONS
Product Research, IP
New Product Development
IP Creation and Filing

EXPERIENCE
17 papers in UAV
NPD experience in UAVs
Holds UAV Patents

EDUCATION
BE, ME, Ph.D. (UAV Systems)



RAJA S. RAMAN
CHIEF BUSINESS OFFICER

RESPONSIBILITY
Sales & Marketing

EXPERIENCE
26 years experience

FUNCTIONS
Drone Rental and Drone Sales
Contracts, PR
Partner Ecosystem Creation

EXPERIENCE
15 years exp in US Aerospace industry
Led manufacturing companies in USA
Experience in the US and Europe markets

EDUCATION
MMS, BITS-Pilani



M KANNAN
BOARD ADVISOR - AGRICULTURE

RESPONSIBILITY
Agri Equipment Distribution Expert

EXPERIENCE
24 years experience

FUNCTIONS
Dealer Strategy
Drone Sales Strategy
Drone Finance Programs

EXPERIENCE
Divisional Manager – John Deere
Sales Manager – CNH Tractors
DGM Sales – Mahindra Tractors

EDUCATION
BE, BITS Pilani

BUSINESS CUSTOMERS



UAV PRODUCT RANGE

DUMS AGRIGATOR
10L/16L SPRAYING DRONE



AGRICULTURE SPRAYING

DUMS MINEGATOR
MINE MANAGEMENT



MINING

DUMS INVESTIGATOR
SURVEILLANCE DRONE



POLICE

DUMS SURVIGATOR
SURVEY 6-7 KMS RANGE DAY & NIGHT



SURVEY

DUMS MITIGATOR
BVLOS DRONE TO SEARCH & DELIVER



LOGISTICS

DUMS ALTIGATOR
100 KMPH DRONE FOR 180 MINUTES



NAXAL TRACKING | FORESTRY | HADR

AGRICULTURE SPRAYING DRONE

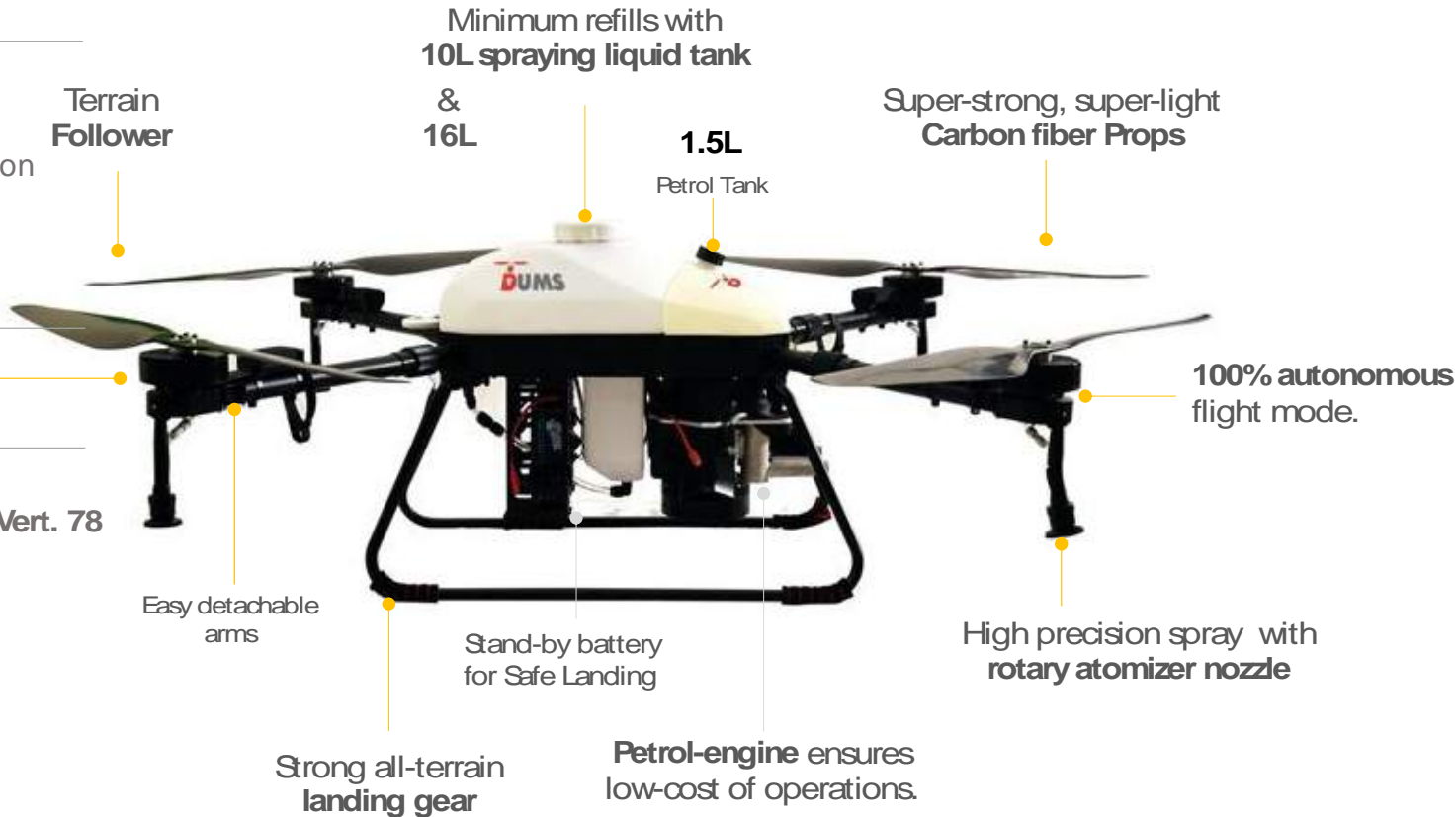
Max Slope
35°

Altitude Detection
1 – 30 m

Stabilization
1.5 – 15 m

Obstacle
Avoidance

FPV Camera
FOV Horiz. 98 Vert. 78
Res. 1080x960



Spraying per day
8 hours

One acre of spraying takes
< 10 min

4 take-offs in one hour
About 30 take-offs per day (8 hours)

Acres sprayed per day
30 to 35 Acres per drone in various trials

Petrol needed is
650 ml per acre

Operational cost is < Rs. 150 /acre
Service provider revenue: 400 to 1200/acre

Reduces Overall Cost of Spray
Operations by >30%

Reduces Pesticide consumption
by > 30%

Reduces Water consumed with
Pesticides by 80%

15 – 20 times faster than manual
spraying.

ENGINEERED FOR EXCELLENCE

40" Carbon Fiber Propellers
Manufactured By Dhaksha



4 TEEJET XR11001VS (or)
4 German Agro 11001 (or)
4 Rotary Atomizer Nozzle
Droplet size 130 – 250 Mm

Adj. Spray Width
2m – 6 m

Max Spray Flow Rate
ISO 005 Nozzle 1.8 L/min
ISO 040 Nozzle 3.6 L/min

10L/16L Spraying Liquid Tank
Petrol / Acre 700 ml
Regular Petrol 91 or above

1.5L Petrol Tank
Petrol per Acre 700 ml
Regular Petrol 91 or above



120 CC Aluminum Body
2-stroke Engine

DHAKSHA DRONES IN ACTION

ORGANIZATION	SPRAY JOB DONE	LOCATION	CROPS
One of India's top Fertilizer Co.	Pesticide spraying (4500 Acres)	Vijayawada, Andhra Pradesh	Chilly Cotton
One of India's top Fertilizer Co.	Pesticide spraying (1550 Acres)	Raichur, Karnataka	Rice Vegetables
One of India's top Pesticide Co.	Pesticide spraying (430 Acres)	Miryalaguda, Telangana	Paddy
One of India's top Pesticide Co.	Pesticide spraying (170 Acres)	Indore, Madhya Pradesh	Onion
One of India's top Pesticide Co.	Pesticide spraying (330 Acres)	Ahmedabad, Gujarat	Mango (8' crop)
A Micro-Nutrients Manufacturer	Micronutrients	Vijayawada, Andhra Pradesh	Toor Dhal
Various Farmers	Pesticides (1100+ Acres)	Ahmedabad, Gujarat	Potato Sugarcane Chilly Tomato

DHAKSHA DRONES IN ACTION

TAFE	Pesticide spraying	Many areas in Tamilnadu	Rice, Vegetables Paddy, Sugarcane Maize Tea Estates And other crops
TNAU	Pesticide spraying	Virudhachalam, Tamilnadu	Cashew Trees
TNAU	Pesticides, Nutrients, Nano Fertilizer	Multiple locations	Multiple R&D activities
Ponneri Farmers	Panchakavyam Fish Amino Acid	Ponneri, Chennai	Paddy Vegetables
Greater Chennai Corporation	Disinfectant spraying	15 Circles in Chennai	Disinfectant spraying for COVID-19
Greater Chennai Corporation	Larvicide spraying	112 kms of rivers in Chennai	Mosquito larvicide spraying with 95% efficacy
Gujarat State	Insecticide spraying	Multiple locations	Locust eradication
Rajasthan State	Insecticide spraying	Multiple locations	Locust eradication
Anna University	Pesticides Micronutrients Organic Fertilizer Weedicides	Multiple locations	Research & Development

KADI, GUJARAT | TOMATO CROP



LOCATION	CROP	VARIETY	DAYS SOWN	FORMATION	CROP HEIGHT
Kadi, Gujarat	Tomato	135 days crop	45 days	Flowers and Raw Tomatoes Formed	30 Cms
CROP SUPPORT		MAX HEIGHT	BETWEEN CROPS	BETWEEN ROWS	
6 feet wooden sticks		75 Cms	45 Cms	150 Cms	

DESCRIPTION	USING MANUAL METHOD	USING TRACTOR & PUMP	USING DHAKSHA DRONE
Acres per day	2 acres	10 acres	25 acres
Difficulty Level	High and time consuming	High due to long pipes for 10 acres	Easy reach and operations
Water used	180 L per acre	180 L per acre	12 L per acre
Amount of Pesticide	100%	100%	70%
Spray Cost	Rs. 400-440 /acre	Rs. 230 /acre 0.8 L Diesel, 3 Labourers	Rs. 125 /acre Incl. pilot, fuel, transportation costs
Time Consumed	3 hours /acre	45 min /acre	6 min /acre
Hazard Level	Very High	Medium	Nearly Zero

COMPLETE SOLUTIONS

**DHAKSHA
DRONE SYSTEM**



**DHAKSHA DRONE
MAINTENANCE TRAINING**



- **Technicians** Trained

**DRONE PILOT
TRAINING**



- **Pilots** Training – 10 days
- **Through** Anna Univ
- **10 Year** License in India

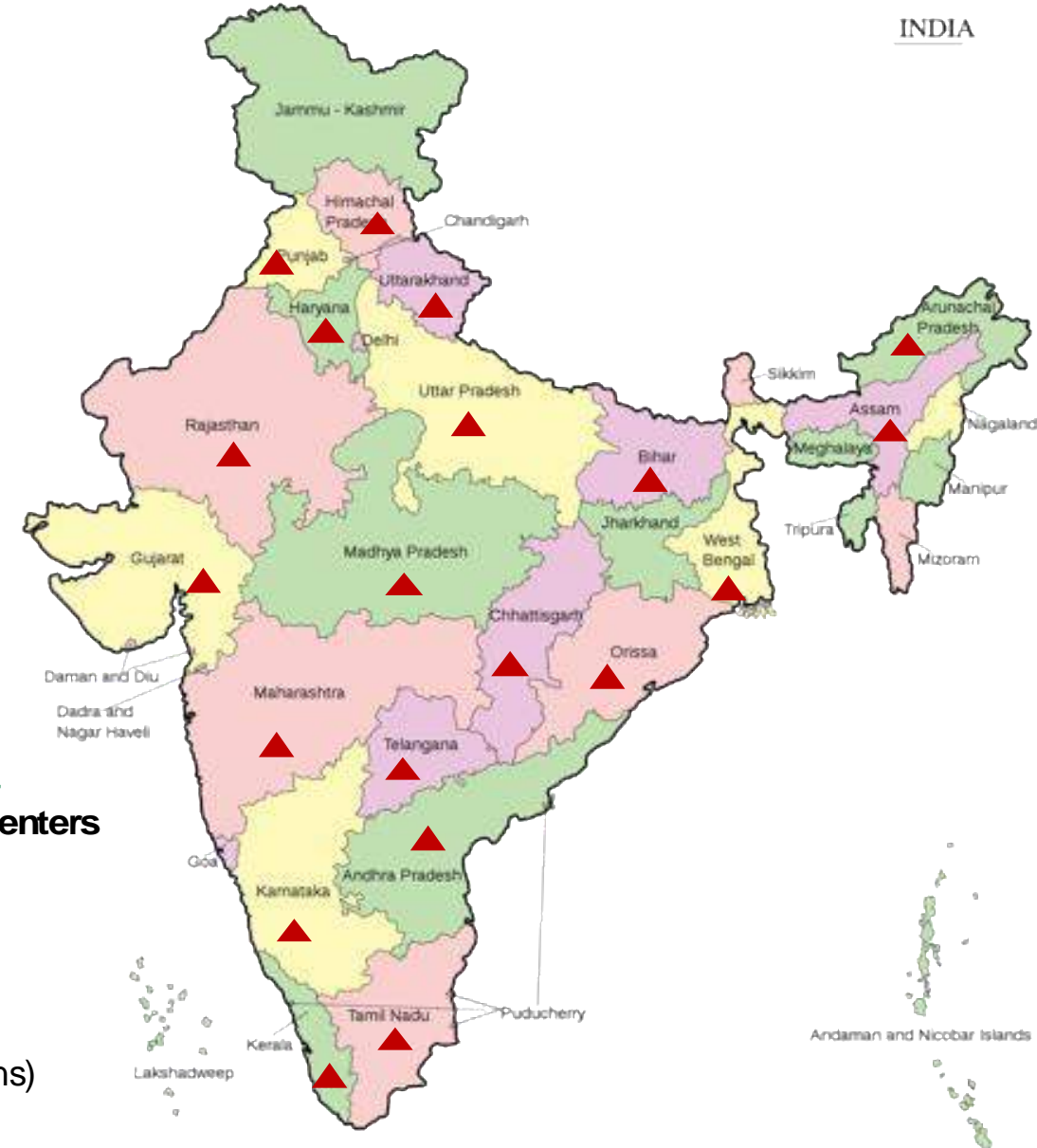
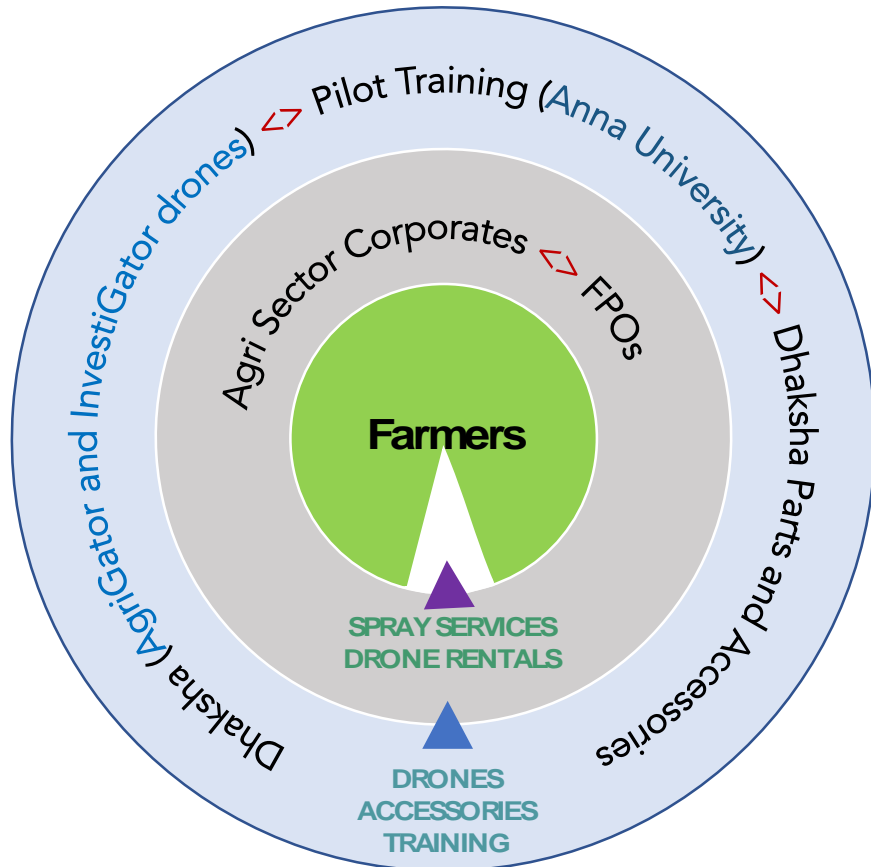
**REPAIR/REPLACEMENT
WARRANTY (1 to 3 Years)**



**SPARES, PAYLOADS &
ACCESSORIES**

200+ parts and accessories
30+ Payloads

**DRONE INSURANCE
(TROPOGO & ICICI LOMBARD)**



Dhaksha's Nationwide >> Drone Sales & Support Centers

- Drone Servicing
- Drone Backups
- Accessories
- Training (in key locations)