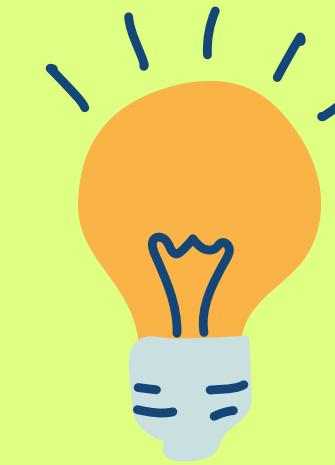




AGRO VISIONARIES

By ASTERI

WHY DO WE NEED A SOLUTION FOR THIS PROBLEM?



Rising Global Population:

- The global population is expected to reach 9.7 billion by 2050, increasing the demand for food. Efficient farming practices are critical to meet this demand without straining resources.

Resource Scarcity:

- Water scarcity is becoming a critical issue globally, with agriculture consuming 70% of the world's freshwater. Wasteful irrigation and resource use exacerbate this problem.

Environmental Impact:

- Inefficient farming practices lead to soil degradation, water pollution, and increased greenhouse gas emissions, contributing to climate change and the loss of biodiversity.

High Operational Costs:

- Traditional farming methods result in increased use of fertilizers, pesticides, and water, which drive up costs for farmers and reduce profitability, especially for small-scale farmers.

Labor-Intensive:

- Conventional farming is still highly dependent on manual labor, making it inefficient, expensive, and difficult to scale, especially in rural areas with labor shortages.

Food Security Risks:

- Inefficiencies in resource use can lead to crop failures, impacting food production and global food security, particularly in regions highly vulnerable to climate change.

Sustainability Demands:

- Consumers, governments, and industries are increasingly demanding sustainable agricultural practices that minimize environmental harm while maximizing productivity.

Technological Advancements:

- With emerging technologies like AI, robotics, and IoT, it's now possible to create autonomous, data-driven solutions that can optimize farming practices, making them more efficient and sustainable.

OUR PROBLEM STATEMENT IS BASED ON THESE SDGS



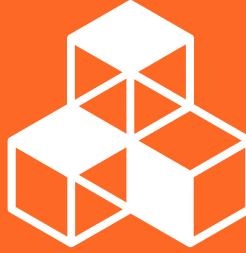
1 NO
POVERTY



8 DECENT WORK AND
ECONOMIC GROWTH



9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



11 SUSTAINABLE CITIES
AND COMMUNITIES



12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



15 LIFE
ON LAND



17 PARTNERSHIPS
FOR THE GOALS





PROBLEM STATEMENT



In many farming communities, small-scale farmers work tirelessly to grow the food we all depend on. However, they often struggle with the high costs of fertilizers, outdated equipment, and the exhausting labor required to apply fertilizers manually. For these farmers, each growing season brings tough choices—like using less fertilizer to save money, even though it may lead to lower yields.

Without access to affordable, modern tools, they're caught in a cycle where they can't fully benefit from the hard work they put into their fields. Over-fertilizing or under-fertilizing not only reduces productivity but also strains the land they rely on year after year.

These challenges call for a practical solution—one that empowers farmers with an easy-to-use, affordable technology to make the most of every season and every field.

SOLUTION OVERVIEW



Our solution is an **Autonomous Fertilizing Drone** designed specifically to help small-scale farmers increase productivity and reduce costs through precise, automated fertilization. This drone combines easy-to-use technology with smart automation, making it accessible even to farmers with limited experience with advanced equipment.

1. How It Works

- The drone uses GPS and sensors to navigate fields, identifying exactly where and how much fertilizer is needed. This precision minimizes waste and ensures that crops get exactly the right amount of nutrients.

2. Cost-Effective & Efficient

- By automating the fertilization process, the drone saves on labor and time, reducing the need for costly manual fertilization. It's a one-time investment that delivers season after season.

3. User-Friendly & Accessible

- Designed with simplicity in mind, the drone can be operated with minimal training. Farmers can set it up quickly, making it feasible for communities without access to extensive technical support.

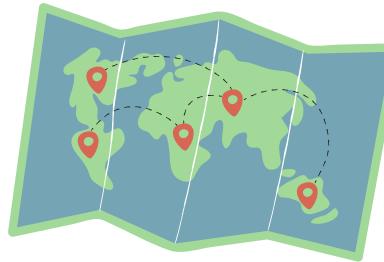
4. Environmental Benefits

- With controlled fertilizer use, the drone promotes sustainable farming practices by preventing over-fertilization, protecting soil health, and reducing run-off that can affect local water sources.

This solution not only supports higher yields and profitability for farmers but also fosters long-term, sustainable land management.



Road Map



1

PROBLEM STATEMENT

4

BLOCK DIAGRAM

5

TECHNICAL IMPLEMENTATION

8

CHALLENGES

2

OBJECTIVES

3

SOLUTION OVERVIEW

6

TARGET AUDIENCE

7

FUTURE SCOPE



OPERATIONAL OVERVIEW



1. Autonomous Farm Mapping:

- The drone autonomously maps the farm, dividing it into manageable tiles based on area size, creating an optimized flight path.

2. Machine Learning-Based Analysis:

- Crop Health Monitoring: Evaluates crop health using ML by analyzing leaf color, growth patterns, and soil moisture.
- Pest Detection: Identifies harmful insects through object detection and sprays pesticides only if insect levels exceed a set threshold.

3. Precision Resource Application:

- The drone sprays fertilizers, nutrients precisely in tiles that need them, minimizing resource waste.

4. Battery Management:

- When battery drops below 10%, the drone returns to its docking station to **recharge** and **resumes** work after reaching full charge.



5. Data Collection and Insights:

- Collects data on **crop health, pest levels, water, and resource usage**, providing farmers with predictive insights and actionable recommendations.

6. Mobile App for Real-Time Monitoring:

- Farmers can **monitor real-time data, control the drone, view historical data, and track resource usage** via a mobile app.

7. Weather Monitoring for Safe Operation:

- The system continuously **monitors weather conditions** (e.g., wind speed, rain) to ensure **safe operation**.



DJI PHANTOM 4 DRONE

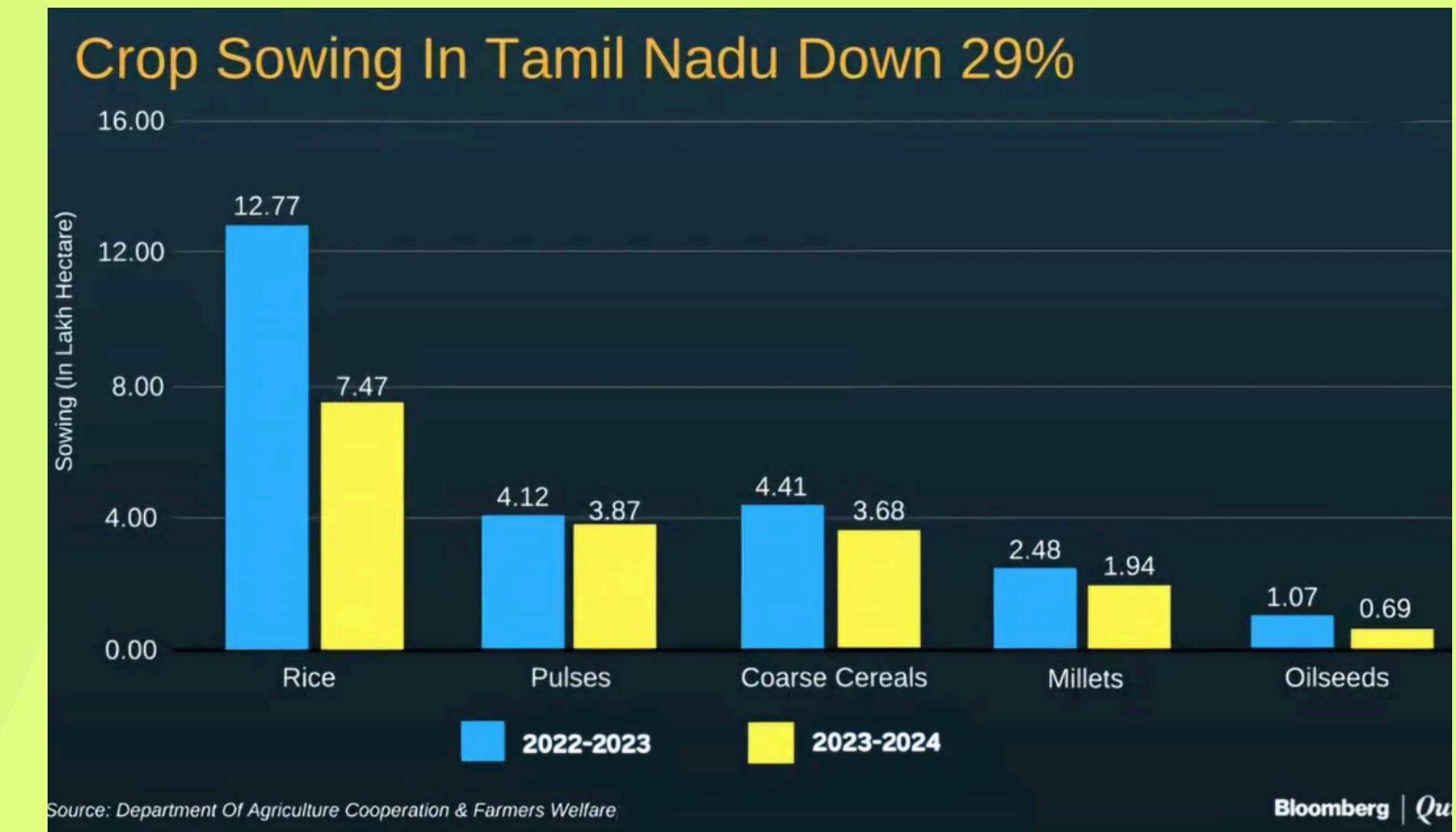
PROBLEM STATEMENT CANVAS



CONTEXT When does the problem occur?	PROBLEM What is the root cause of the problem? Small-scale farmers lack access to affordable, modern agricultural technology. Fertilization processes are labor-intensive, costly, and often imprecise, leading to lower crop yields, wasted resources, and financial strain.	ALTERNATIVES What do customers do now to fix the problem? Farmers often rely on manual application methods, which are time-consuming and prone to over- or under-fertilization. Some might hire labor, which adds to expenses, while others may use traditional tools that lack precision. In some cases, they may reduce fertilizer usage to save costs, affecting crop yield and quality.
CUSTOMERS Who has the problem most often? The primary customers are small-scale farmers in developing or under-resourced areas who can't afford expensive agricultural machinery but still need to optimize their yields and manage input costs effectively.	EMOTIONAL IMPACT How does the customer feel? Farmers feel frustrated and overwhelmed by the constant struggle to improve productivity with limited resources. QUANTIFIABLE IMPACT What is the measurable impact (include units)? Typical small-scale farms experience a 10-20% lower yield due to inefficient fertilization. An autonomous drone could potentially reduce fertilizer waste by 20-30% and increase yields by 15-25%.	ALTERNATIVE SHORTCOMINGS What are the disadvantages of the alternatives? Manual fertilization is time-consuming, labor-intensive, and imprecise. Hiring labor increases costs, and traditional tools lack the precision needed for optimal fertilization. These methods can lead to soil degradation from overuse, reduced yields, and lost income due to inefficiency.

Market Size in India:

- **Agriculture Landscape:** India's agricultural landscape comprises approximately 146.5 million operational holdings, with 86% classified as small and marginal farmers.
- In Tamil Nadu, 93% of the 7.938 million landholders are small and marginal farmers.
- These farmers face challenges such as limited access to institutional credit, often resorting to informal lenders charging high interest rates, sometimes up to 60%.
- Additionally, rising input costs, labor shortages, and climate change impacts, like the severe 2016–2017 drought, have exacerbated their financial struggles.
- Addressing these financial challenges is crucial for enhancing the sustainability and productivity of small-scale farmers in Tamil Nadu and across India.

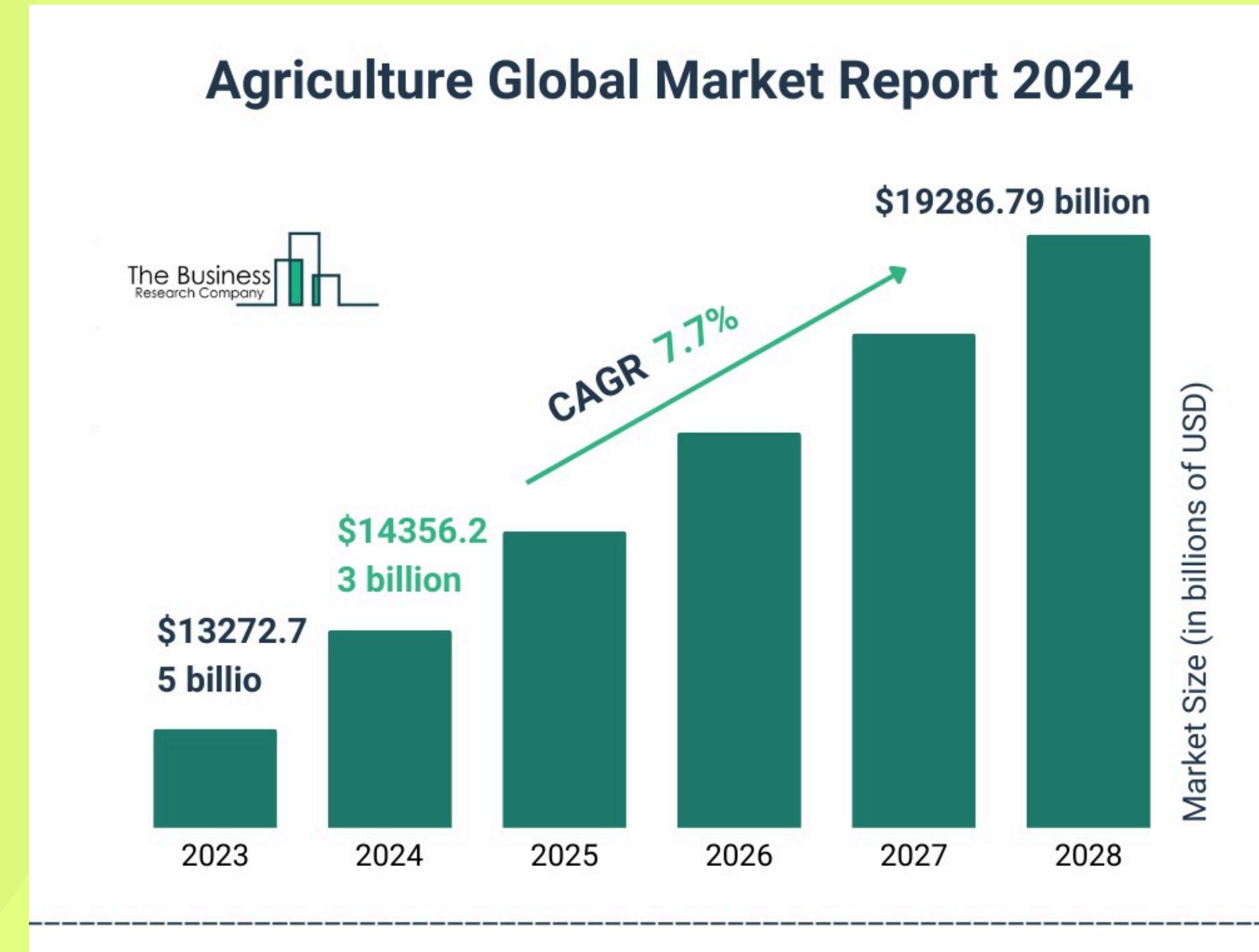


1. Total Addressable Market (TAM)

Definition: The TAM represents the total market value if all small and marginal farmers in Tamil Nadu were to adopt autonomous fertilizing drones.

Estimate: Tamil Nadu has approximately 8 million farmers, of which about 92% are small or marginal. This is around 7.36 million small-scale farmers.

For affordability, it's very likely that small farmer groups or cooperatives would share one drone among every 10 farmers.





2. Serviceable Available Market (SAM):

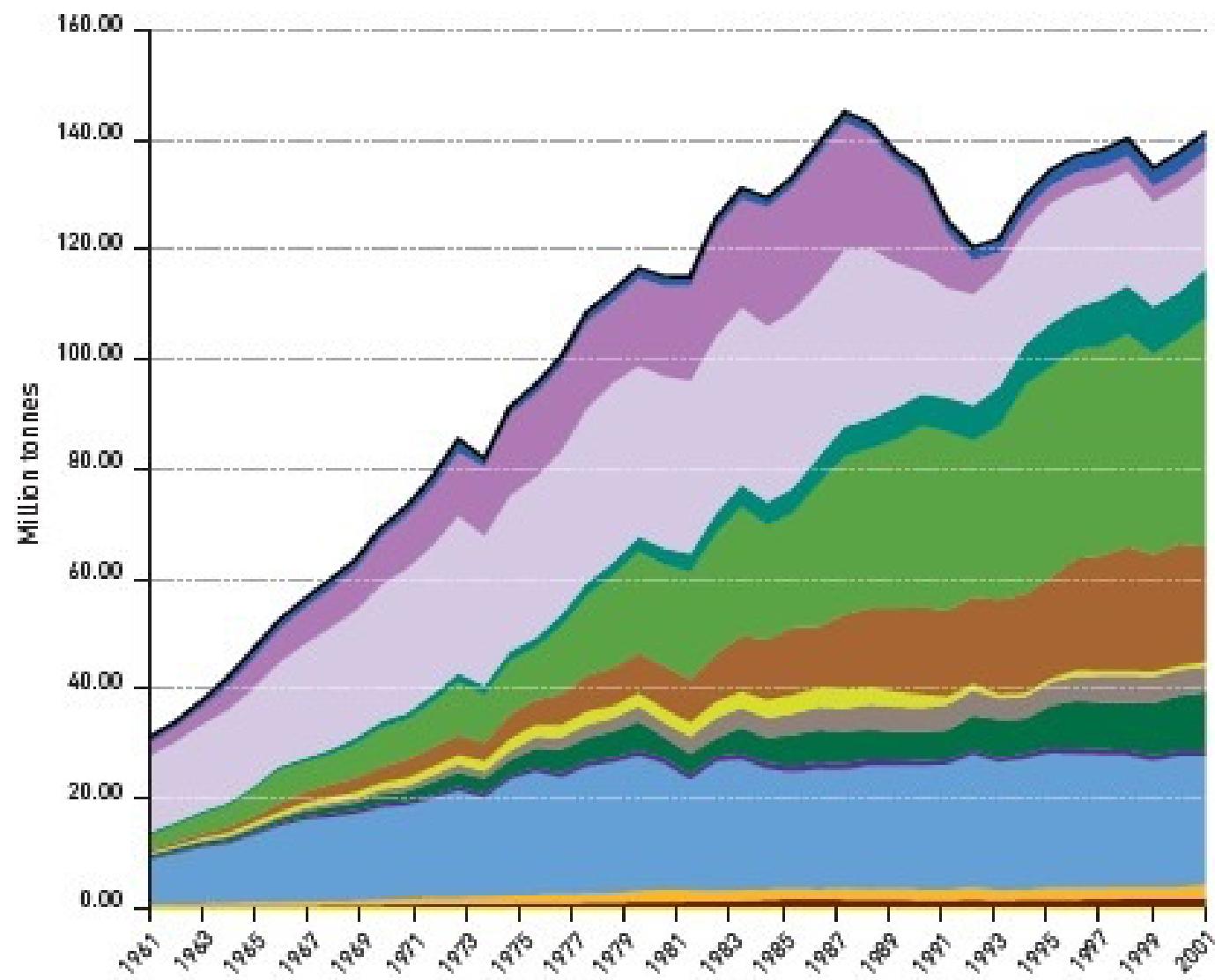
Definition: The SAM is the portion of the TAM that includes farmers in Tamil Nadu who are financially ready to invest in this technology.

Estimate: Of the 736,000 potential drone units needed to cover all farmers in Tamil Nadu, let's assume that 10% could be realistically reached through available financing options.

This would mean a target of 73,600 drones and with each drone costing ₹86,000, the SAM would be:

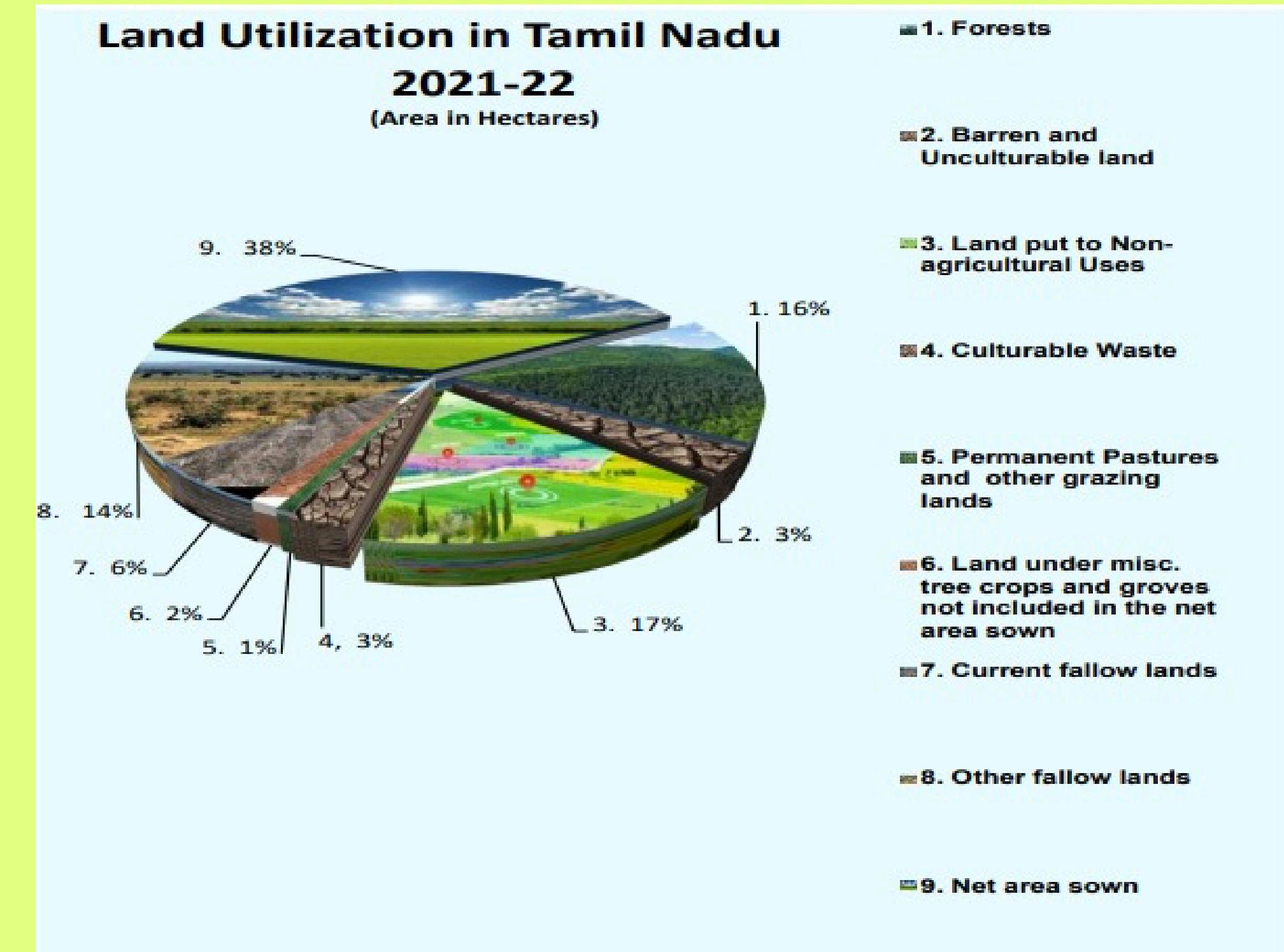
$$73600 * 86000 = 632.96 \text{ crores}$$

FIGURE 3.3: TRENDS IN FERTILIZER USE



3. Serviceable Obtainable Market (SOM):

- **Definition:** The SOM is the share of the SAM that the business can realistically capture within the first 5 years of launching, considering adoption rates, partnerships, and initial awareness.
- **Estimate:** Assuming 10% of the SAM can be captured in the initial phase due to early adoption, partnerships with cooperatives, and government incentives, we target 36,800 drones for the first 5 years.
- With each drone costing ₹86,000, the SOM would be 310 crores rupees.



Tamil Nadu Percentage of District Agricultural Land



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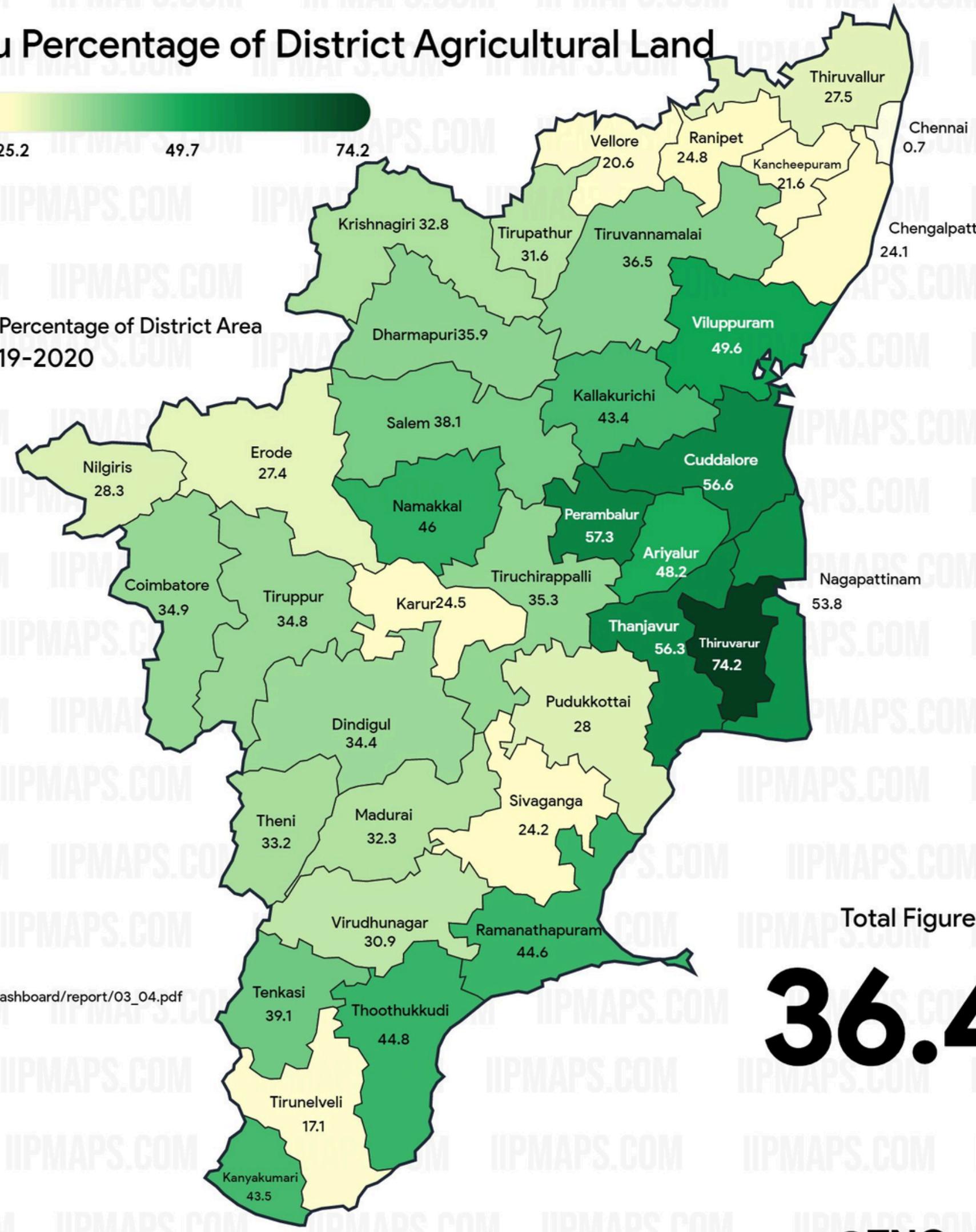
0.7 25.2 49.7

0.7

25.2

49.7

Net Area Sown in Percentage of District Area
In the Year 2019-2020



Total Figure

36.4%

Source

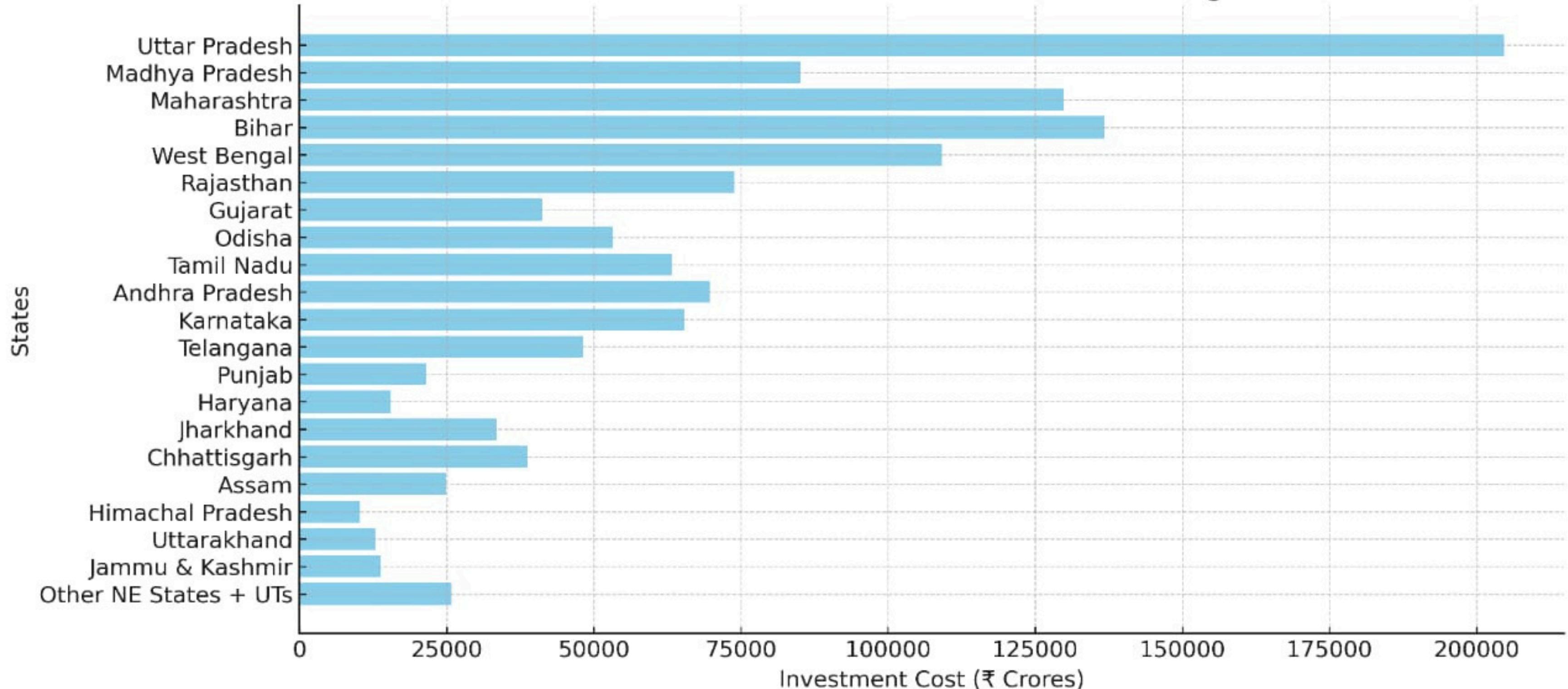
http://www.tnagriculture.in/dashboard/report/03_04.pdf

Created by
IIPMAPS.COM



The Total Estimated Cost required for autonomous fertilizing drones across india is approx. Rs.10.8 Trillion

State-wise Investment Cost for Autonomous Fertilizing Drones in India



Central-Government Schemes



भारत सरकार
GOVERNMENT
OF INDIA

1. Sub-Mission on Agricultural Mechanization (SMAM):

Farmers can receive financial assistance for purchasing agricultural drones. Small and marginal farmers, as well as those belonging to Scheduled Castes/Scheduled Tribes, women, and farmers from the Northeast, can get a subsidy of up to 50% of the drone's cost, capped at ₹5 lakh. Other farmers are eligible for a 40% subsidy, up to ₹4 lakh.

2. Namo Drone Didi Scheme:

Announced in the Union Budget 2024-25, this initiative allocates ₹500 crore to empower 15,000 women self-help groups with drones. These SHGs will provide drone-based services to farmers on a rental basis, facilitating wider adoption of this technology.

3. Krishi Vigyan Kendras (KVKs):

Provide training and demonstrations on the latest agricultural technologies.

These programs aim to increase efficiency in agriculture by leveraging drone technology for activities such as pesticide spraying, crop health monitoring, and precision farming. Drones can reduce costs and improve resource use, benefiting farmers economically and operationally.

State-Government Schemes



1. Chief Minister's Mannuyir Kaathu Mannuyir Kappom Scheme: Focuses on soil fertility, offering green manure and vermicomposting support.

2. Uzhavar Angadis: Establishes farmer markets to connect rural producers with urban consumers, ensuring fair pricing schemes aim to improve income, ensure sustainable farming practices, and enhance access to modern agricultural inputs.

3. Cooperative Crop Loans: The government has allocated ₹14,000 crore for crop loans accessible through cooperative banks, helping farmers finance their crop cultivation and operational costs. In recent years, this initiative has supported over 16 lakh farmers annually.

These programs aim to increase efficiency in agriculture by leveraging drone technology for activities such as pesticide spraying, crop health monitoring, and precision farming. Drones can reduce costs and improve resource use, benefiting farmers economically and operationally.

Collaborations with NGOs and Private Companies

Stabilitas Solvents And Chemicals Private Limited

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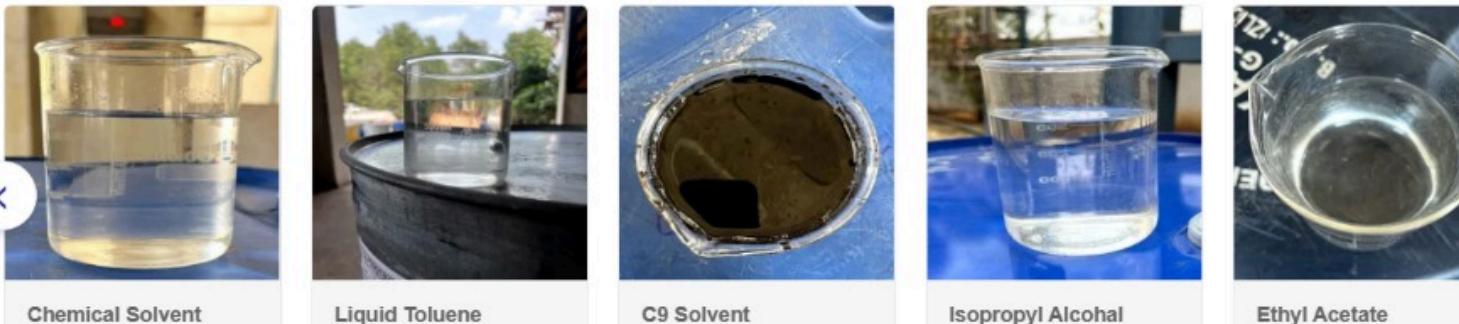
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- Liquid Toluene** 2 products available
- C9 Solvent** 1 product available
- Isopropyl Alcohol** 1 product available
- Ethyl Acetate** 1 product available
- Acetone Solvent** 1 product available
- Methylene Dichloride** 1 product available

Our Products



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Stabilitas Solvents And Chemicals Private Limited

Established as a Proprietor firm in the year 2017, we "Stabilitas Solvents And Chemicals Private Limited" are a leading Manufacturer of a wide range of Ethyl Acetate,Acetone Solvent,Methylene Chloride, Chemical Solvent etc.

Company Album



Ambuja FOUNDATION

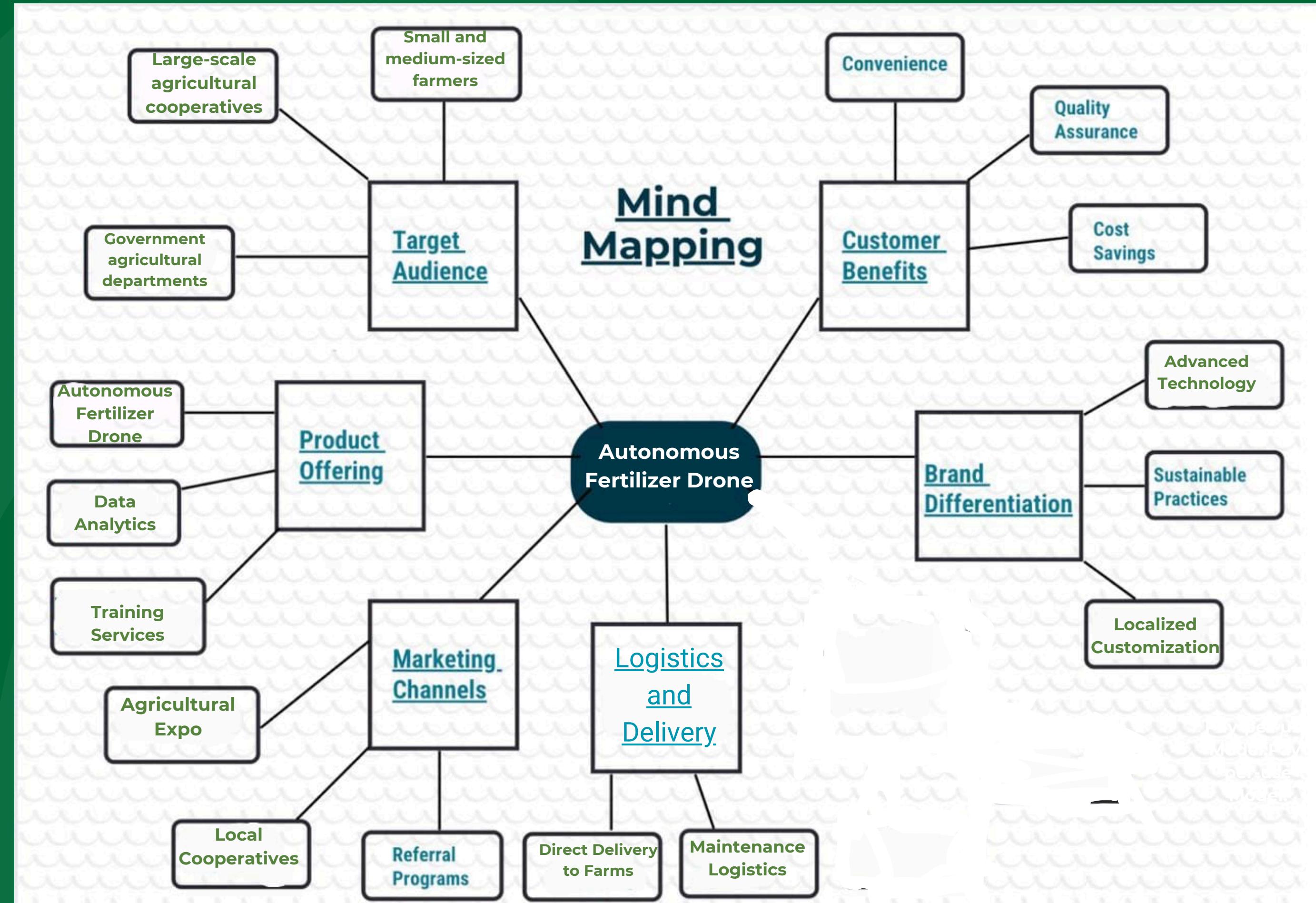
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AGRICULTURE
SUSTAINABLE FARMING MODELS &
CAPACITY BUILDING



MIND MAPPING CANVAS



BUSINESS MODEL CANVAS

<p>Key Partners</p> <ul style="list-style-type: none"> • Local drone manufacturers and suppliers • Agricultural extension services • Fertilizer companies • Tamil Nadu Agricultural University and other research institutions • Government agriculture and rural development departments • NGOs focused on sustainable farming 	<p>Key Activities</p> <ul style="list-style-type: none"> • Research and development of drone technology for agriculture • Manufacturing and assembling drones • Testing and regulatory compliance • Maintenance and repair services • Training programs for farmers on drone usage • Marketing and promotion <p>Key Resources</p> <ul style="list-style-type: none"> • Skilled R&D team for drone development • Partnerships with local fertilizer experts • Financial resources for scaling up production and outreach • Agricultural datasets to optimize drone performance • Manufacturing and service facilities 	<p>Value Propositions</p> <ul style="list-style-type: none"> • Increased crop yield through precise fertilizer application • Reduced labor costs and improved efficiency • Environmentally friendly by reducing fertilizer wastage • Accessible for small and marginal farmers in Tamil Nadu • User-friendly interface for easy adoption by farmers • Enhanced monitoring of crop health 	<p>Customer Relationships</p> <ul style="list-style-type: none"> • Dedicated customer support for maintenance and troubleshooting • Educational workshops and demonstrations • Regular feedback collection to improve services • Collaboration with farmers for improvement • Digital platform for direct engagement and support <p>Channels</p> <ul style="list-style-type: none"> • Direct sales through agricultural expos and fairs • Partnerships with local agricultural cooperatives • Collaboration with government schemes to subsidize drones for farmers 	<p>Customer Segments</p> <ul style="list-style-type: none"> • Small to medium-sized farmers in Tamil Nadu • Large-scale agricultural cooperatives • Government and agricultural organizations promoting modern farming • Agri-tech enthusiasts interested in precision agriculture
<p>Cost Structure</p> <ul style="list-style-type: none"> • Research and development costs for drone technology • Manufacturing and assembly costs • Marketing and farmer training expenses • Cost of partnerships and regulatory compliance • Maintenance and repair infrastructure • Customer support system costs 	<p>Revenue Streams</p> <ul style="list-style-type: none"> • Sales of autonomous fertilizer drones • Subscription-based maintenance and support service • Training and consulting services for farmers and cooperatives • Revenue from data collected (if offered as a value-added service) • Government subsidies or grants for agricultural innovation • Partnership revenue with fertilizer companies for bundled products 			



AGROVISIONARIES

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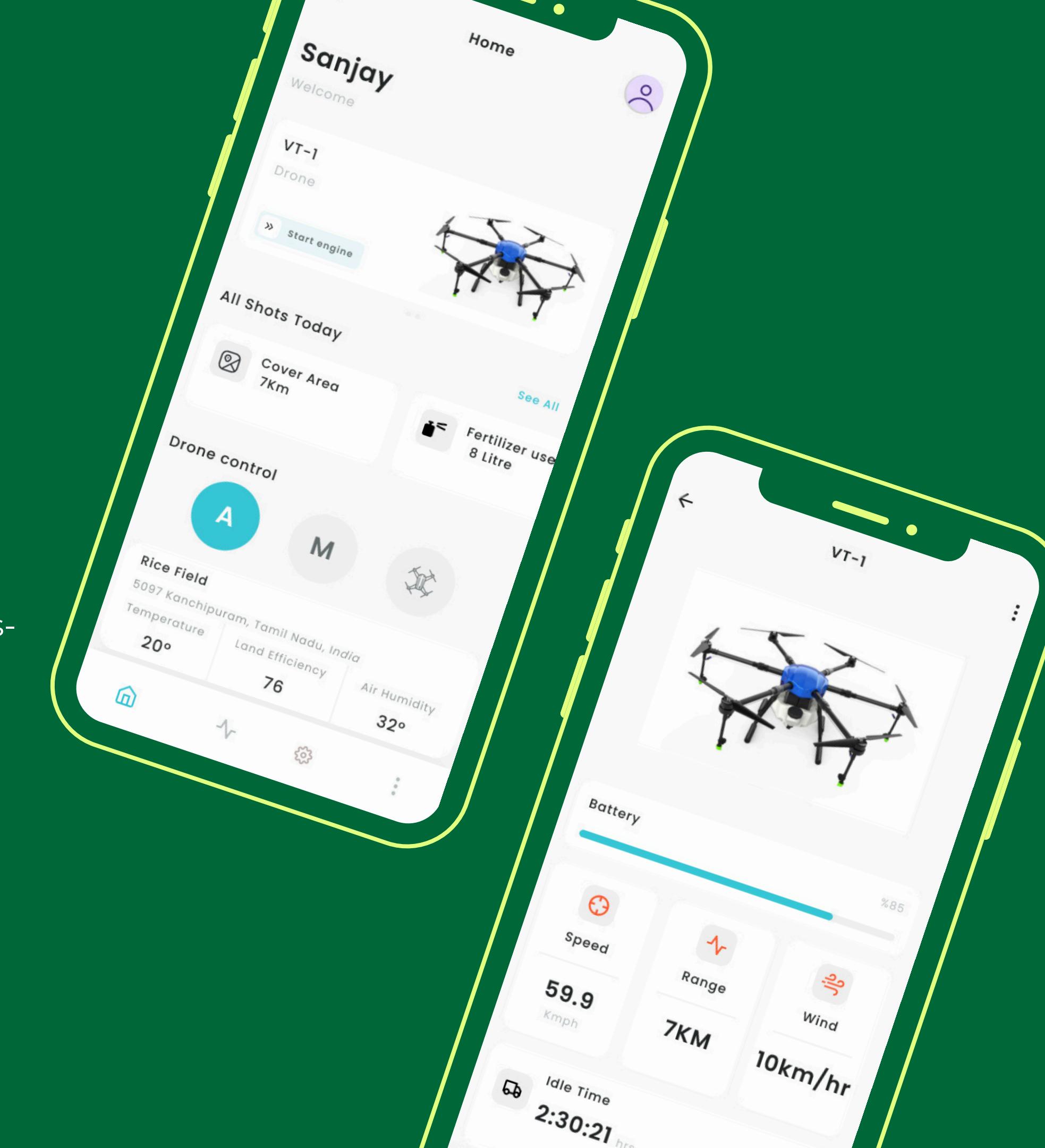
[https://github.com/Sanjay1712KSK/Agro-Visionaries-
By-Asteri](https://github.com/Sanjay1712KSK/Agro-Visionaries-By-Asteri)



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THANK YOU

FOR YOUR ATTENTION