

# Krishi Inspiro

Journey towards a Sustainable tomorrow!



# Krishi Inspiro

NATURE'S PURIFIER



Team: The One

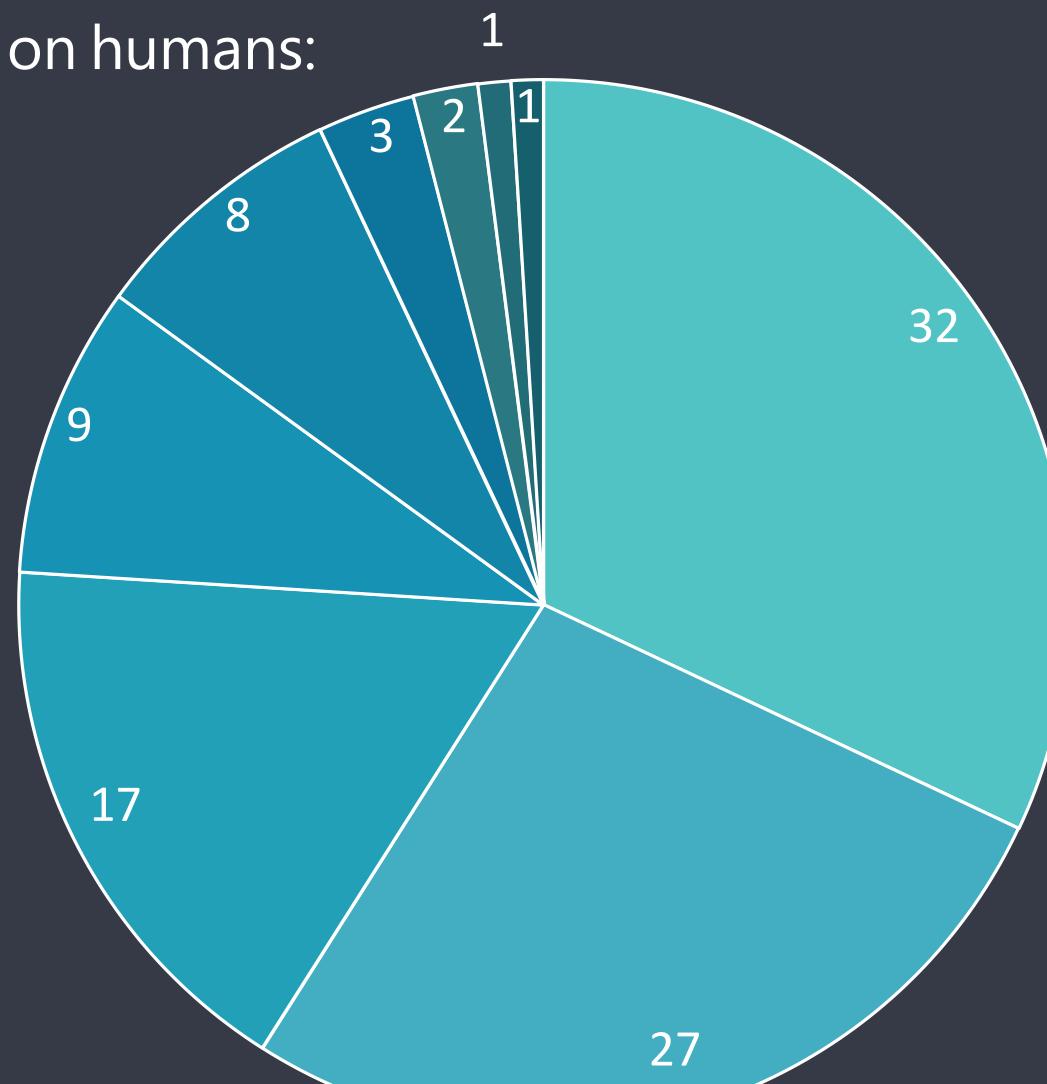
# Problem Statement

Do you know the effects of micronutrients and harsh chemicals?

As per WHO survey

**1.2 billion** people are significantly compromised as industries dump **300 - 400 MT** of effluents each year. Apart from chlorine, these chemicals were found to have a toxic

effect on humans:



■ Chlorine  
■ Aligicide  
■ Bioside

■ Muriatic Acid  
■ Chromium  
■ Sodium Bisulphite

■ Nitrates and phosphates  
■ Sodium bicarbonate  
■ Piggery waste



## Incomplete filtration

Only **59.26%** of water is treated, the rest of the **micronutrients** along with **chemical treatments** remain and enter water bodies and domestic waters.

## Eutrophication

Deposition of these chemicals leads to the **degradation of water bodies, groundwater table**, and disruption in the food chain by **biomagnification**.

## Lack of crop microclimate knowledge

It is a scientific parameter that determines:

- Water for irrigation
- Nutritional Requirements

## Health Hazards

Water with even the slightest change in ppm causes:

- **Skin abnormalities**
- **Digestive and renal problems**

[https://www.who.int/news-room/fact-sheets/detail/drinking-](https://www.who.int/news-room/fact-sheets/detail/drinking-water#:~:text=Key%20facts,water%20source%20contaminated%20with%20faeces.)

water#:~:text=Key%20facts,water%20source%20contaminated%20with%20faeces.

# Problem survey

## Severity

Its High time!

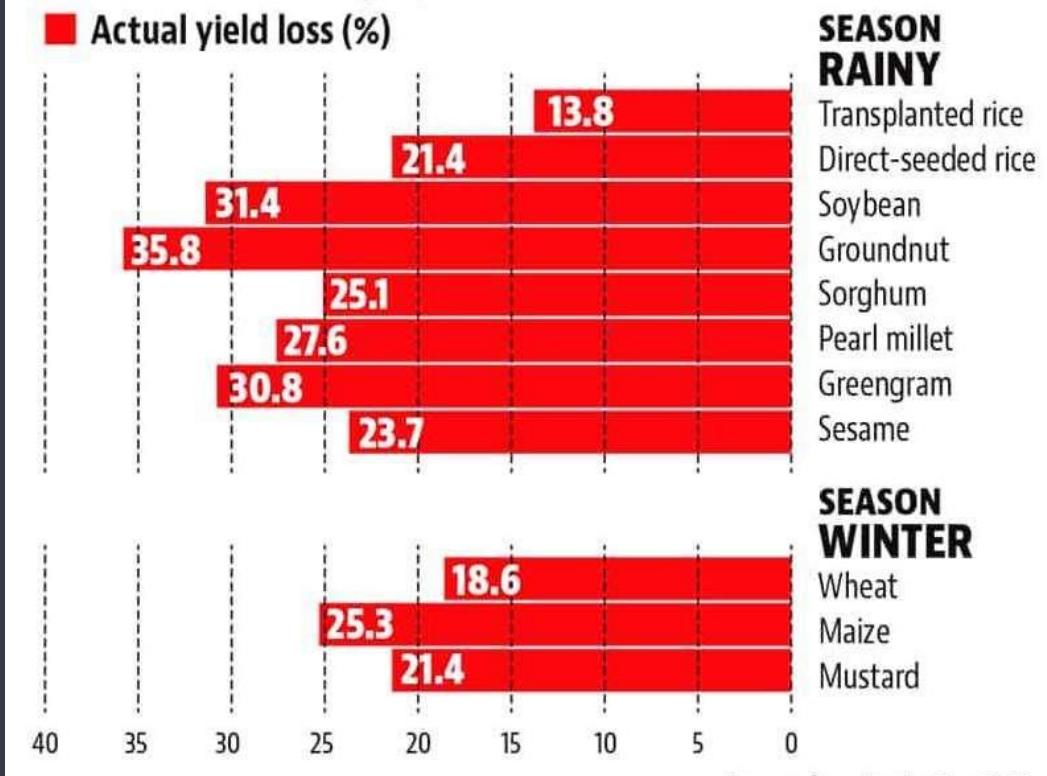
A water survey was conducted in 4 locations in Karnataka which were rural(1), sub-urban(2), urban(3), and Industrial(4) regions.

The results were shocking:

CoD and BoD(indication of purity) of the rural side were dangerously close to the urban, which means chemicals are breaching agricultural land and groundwater table leading to ecosystem destruction.

| Parameter                             | Location-1 | Location-2 | Location-3 | Location-4 |
|---------------------------------------|------------|------------|------------|------------|
| Temperature                           | 34         | 30         | 32         | 32         |
| pH                                    | 8.6        | 8.6        | 8.4        | 9.8        |
| Turbidity                             | 21.2       | 22         | 51         | 73.6       |
| Conductivity ( $\mu\text{Scm}^{-1}$ ) | 400        | 409        | 426        | 472        |
| TSS (mg/l)                            | 108        | 102        | 110        | 118        |
| Total alkalinity (mg/l)               | 64         | 115        | 105        | 124        |
| Chlorides (mg/l)                      | 225        | 116        | 150        | 240        |
| COD (mg/l)                            | 280        | 268        | 250        | 296        |
| BOD (mg/l)                            | 36         | 32         | 27         | 54         |
| Oil and grease (mg/l)                 | 8          | 12         | 8          | 18         |
| Sulphide (mg/l)                       | 24         | 28         | 54         | 70         |

### Yield losses (%) due to weeds

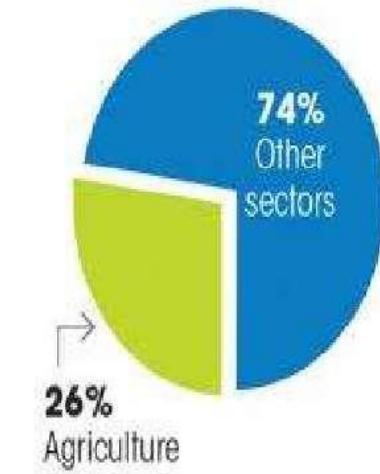
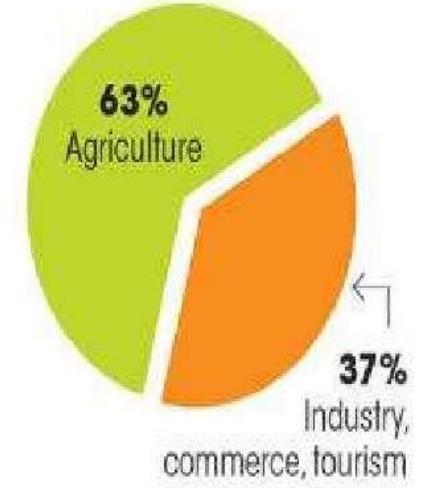


### HEIGHTENED THREAT

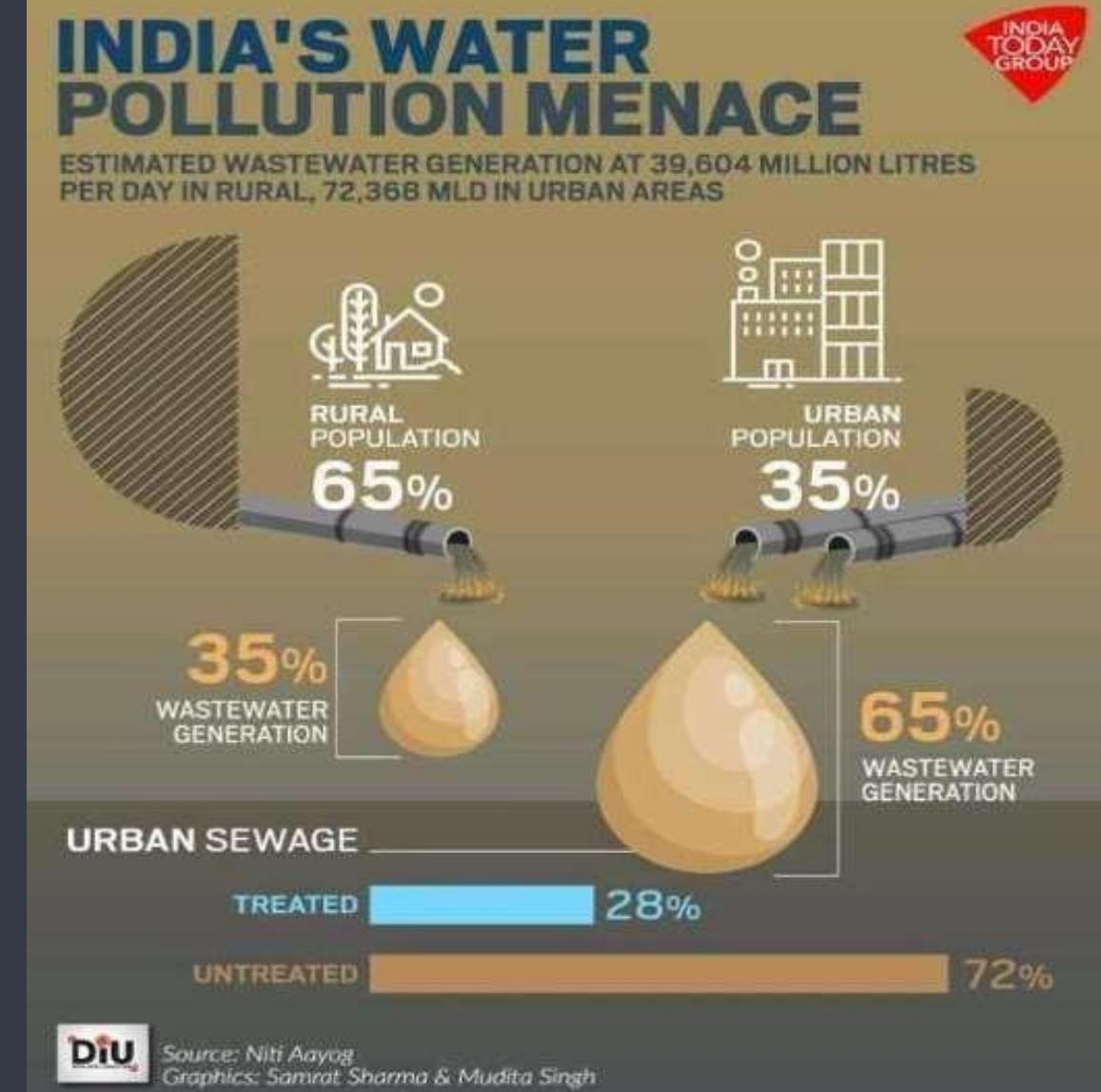
Given its reliance on weather, agriculture is especially vulnerable to the increased frequency/intensity of extreme weather events

Damage and loss in agriculture relative to combined industry, commerce and tourism, 2008-18

Damage and loss in agriculture as share of total damage and loss in all sectors, 2008-18



Source: "The impact of disasters and crises on agriculture and food security: 2021" by FAO

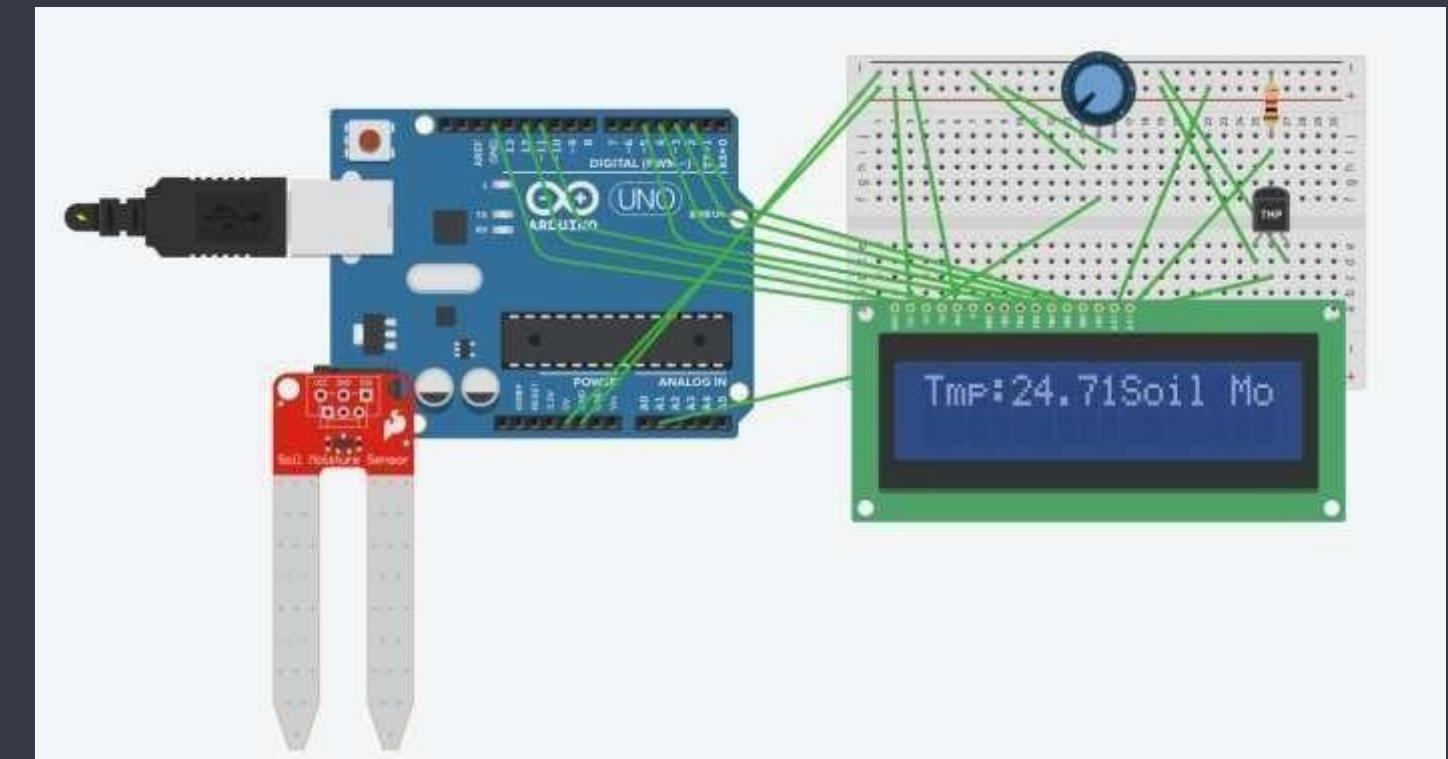


# Solution

Our holistic approach is based on **bio-purification**.

We have created a prototype of an automated aerobic tank:

- Regulated by a microcontroller
- Integrated with the combination of different algae which purifies water.



Conceptual simulation

## 01 Polyethylene Tanks

- Primary tank holds effluent water and algae.
- Secondary tank stores filtered water.



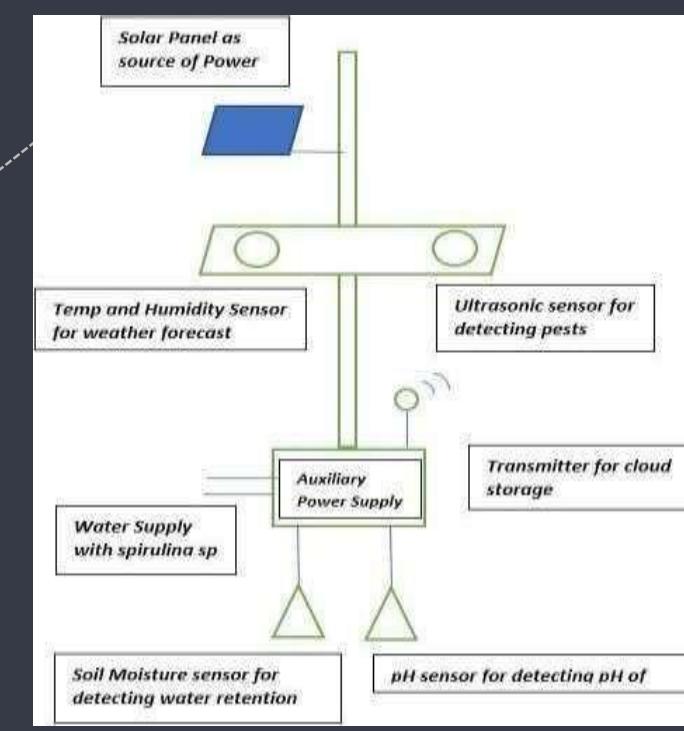
Prototype

## 02 Recombinational algae

The USP of our product which filters the water by absorbing chemicals (biosorption)

## 03 Microcontroller

For automation and less human intervention, we have set up a smart system

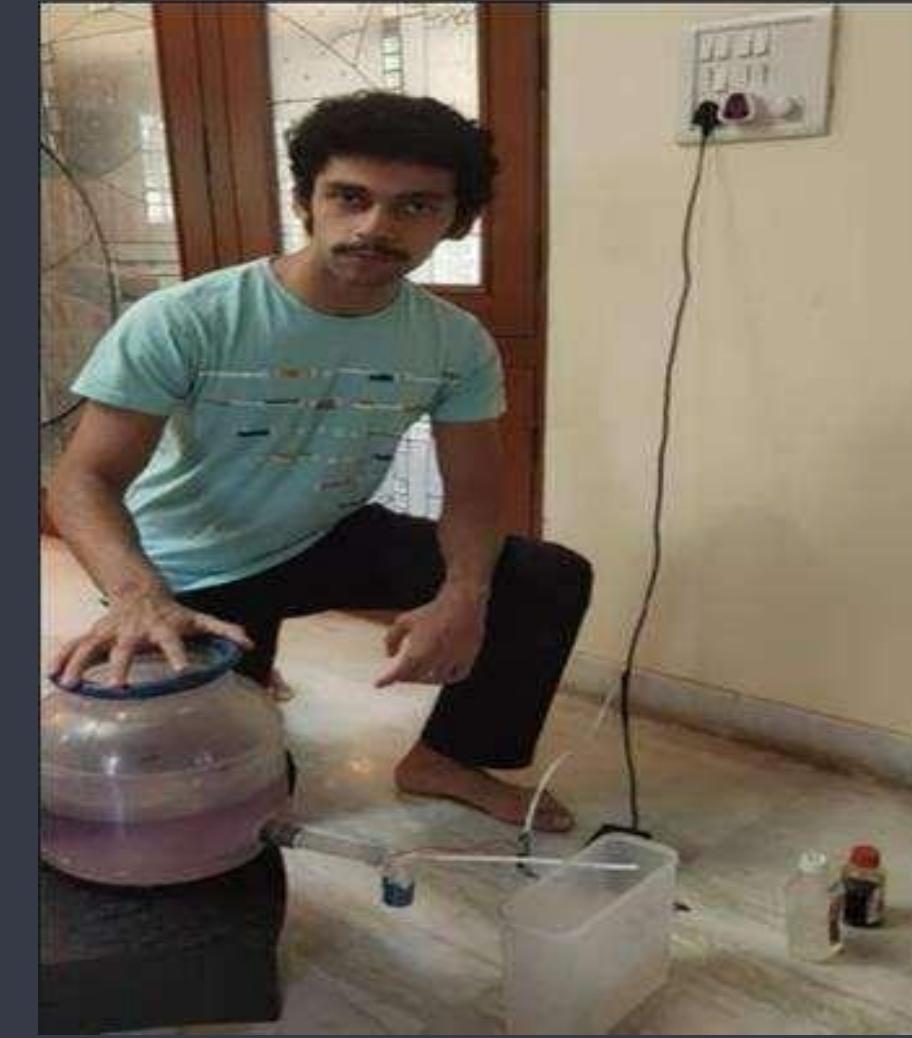


## 04 Sensors

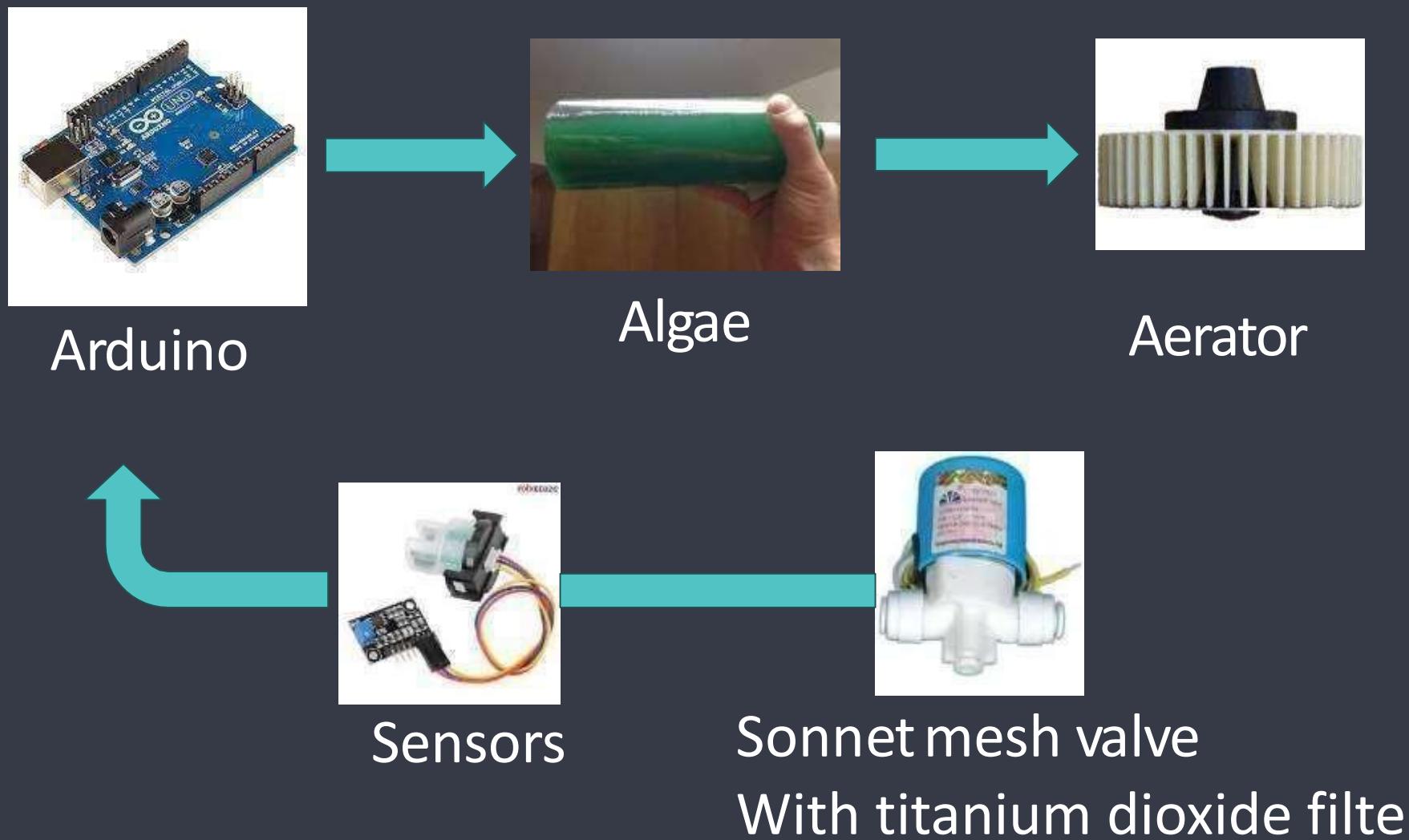
humidity pH, temperature and soil moisture sensors sends microclimate data to controller which will send required message for user

# Methodology

- Once the primary tank has reached its capacity, algae is added and the tank undergoes aeration to initiate the process of biosorption, after a stipulated time all the impurities are absorbed by the algae
- The clean water is then passed through a filter into the secondary tank which is ready for usage.
- The sensors continuously monitor micro-climate of crops which is specific for each crop.
- Once the sensors read the soil requirement it releases water and nutrients to the soil for the crops crops.



Output



```
COM9 (Arduino/Genuino Uno)
*****
***** Water Quality Parameters Values at Coordinator *****
Turbidity value of Water : 2.85 NTU
Temperature value of Water : 27.99*C
ph value of Water : 7.34

*****
***** Water Quality Parameters Values at Coordinator *****
Turbidity value of Water : 2.85 NTU
Temperature value of Water : 27.90*C
ph value of Water : 7.31

*****
***** Water Quality Parameters Values at Coordinator *****
Turbidity value of Water : 2.84 NTU
Temperature value of Water : 27.85*C
ph value of Water : 7.27

Autoscroll
No line ending 9600 baud Clear output
```

The screenshot shows a serial monitor window titled "COM9 (Arduino/Genuino Uno)". It displays three sets of water quality parameters. Each set includes Turbidity, Temperature, and pH values. The first two sets show nearly identical values, while the third set shows slightly different values. The window also features standard serial monitor controls at the bottom: "Autoscroll", "No line ending", "9600 baud", and "Clear output".

# Working



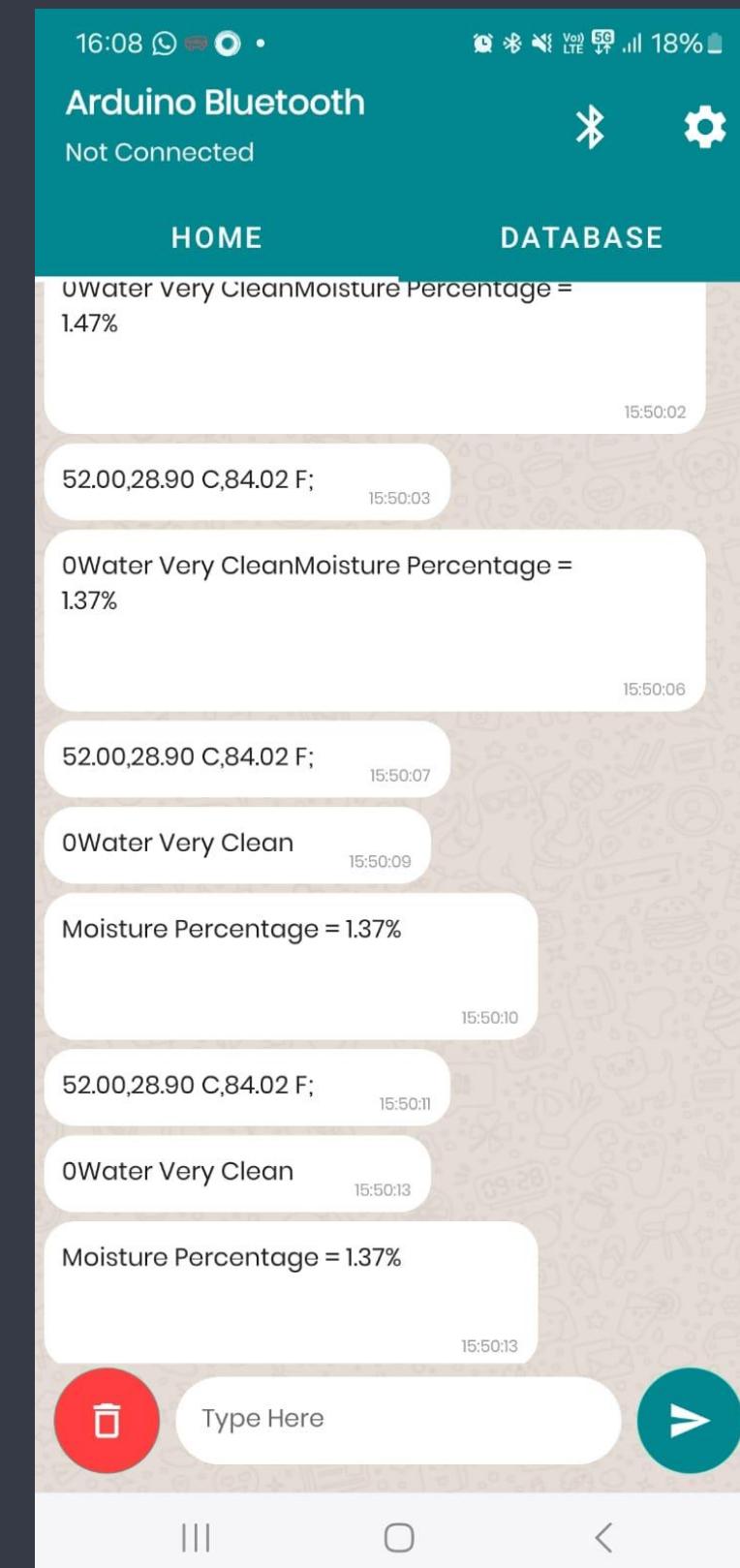
Stage 1  
Maturation



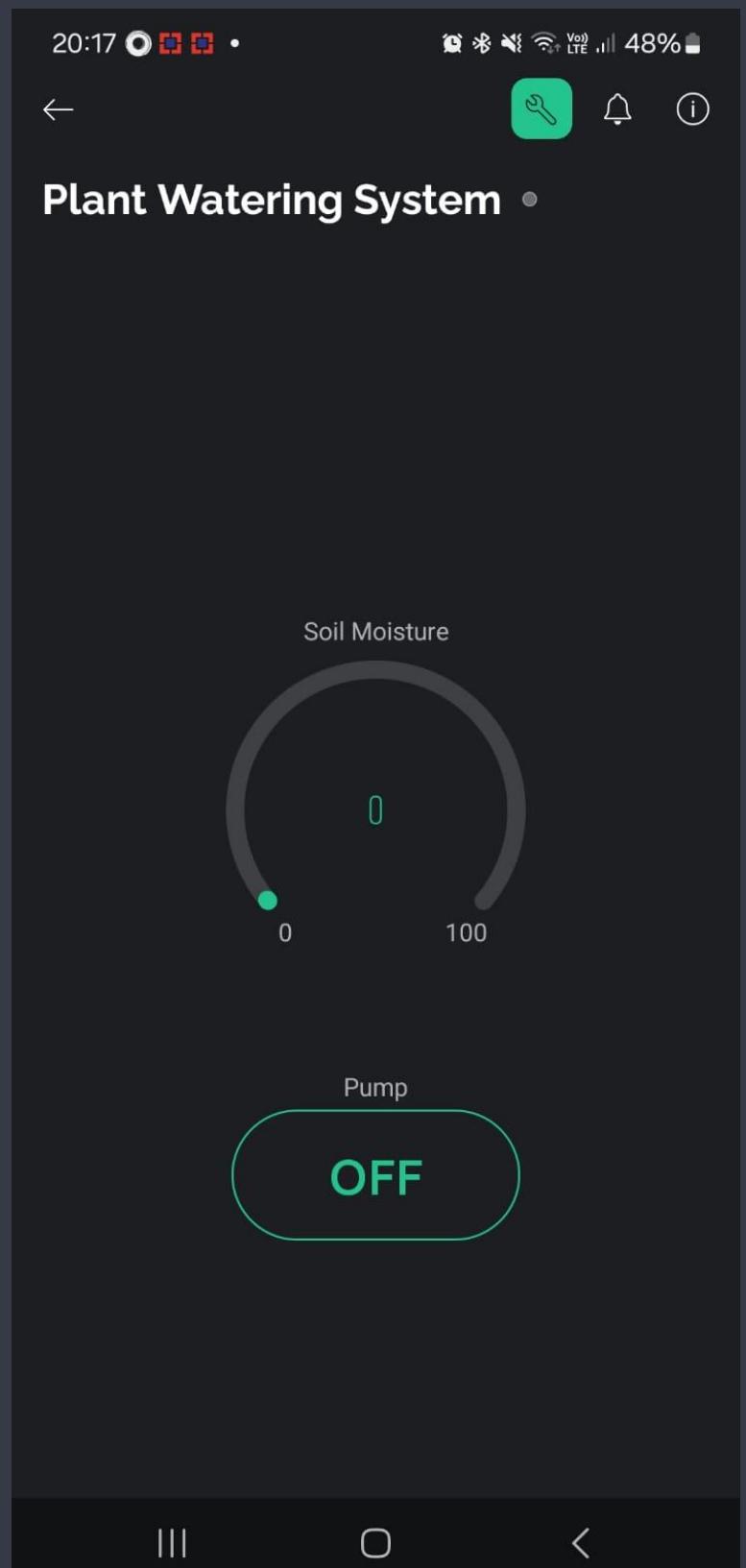
Stage 2  
Protein  
biosynthesis



Stage 3  
Filtration  
and data  
tracking



App1



Beta App  
in progress

# Market Opportunity

## Target Market

Primary: (B2B) Textile and Petrochemical Industries  
Secondary: (B2C) Semi-medium to large farmers

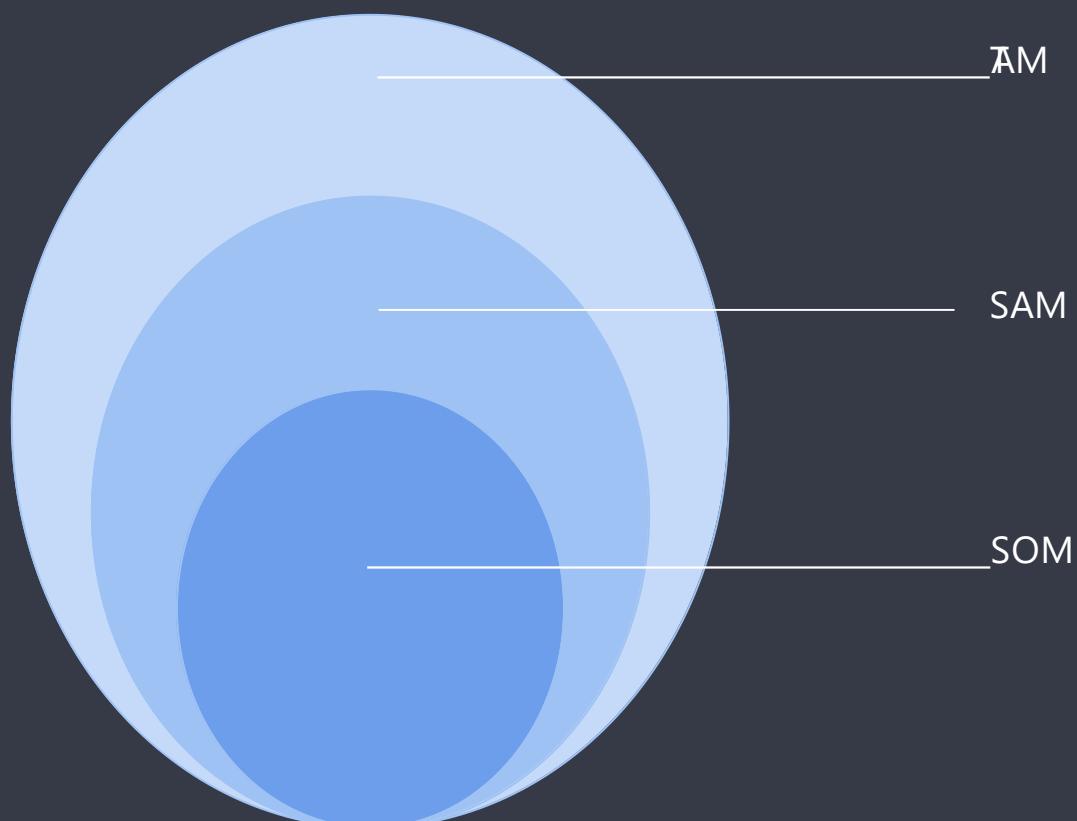
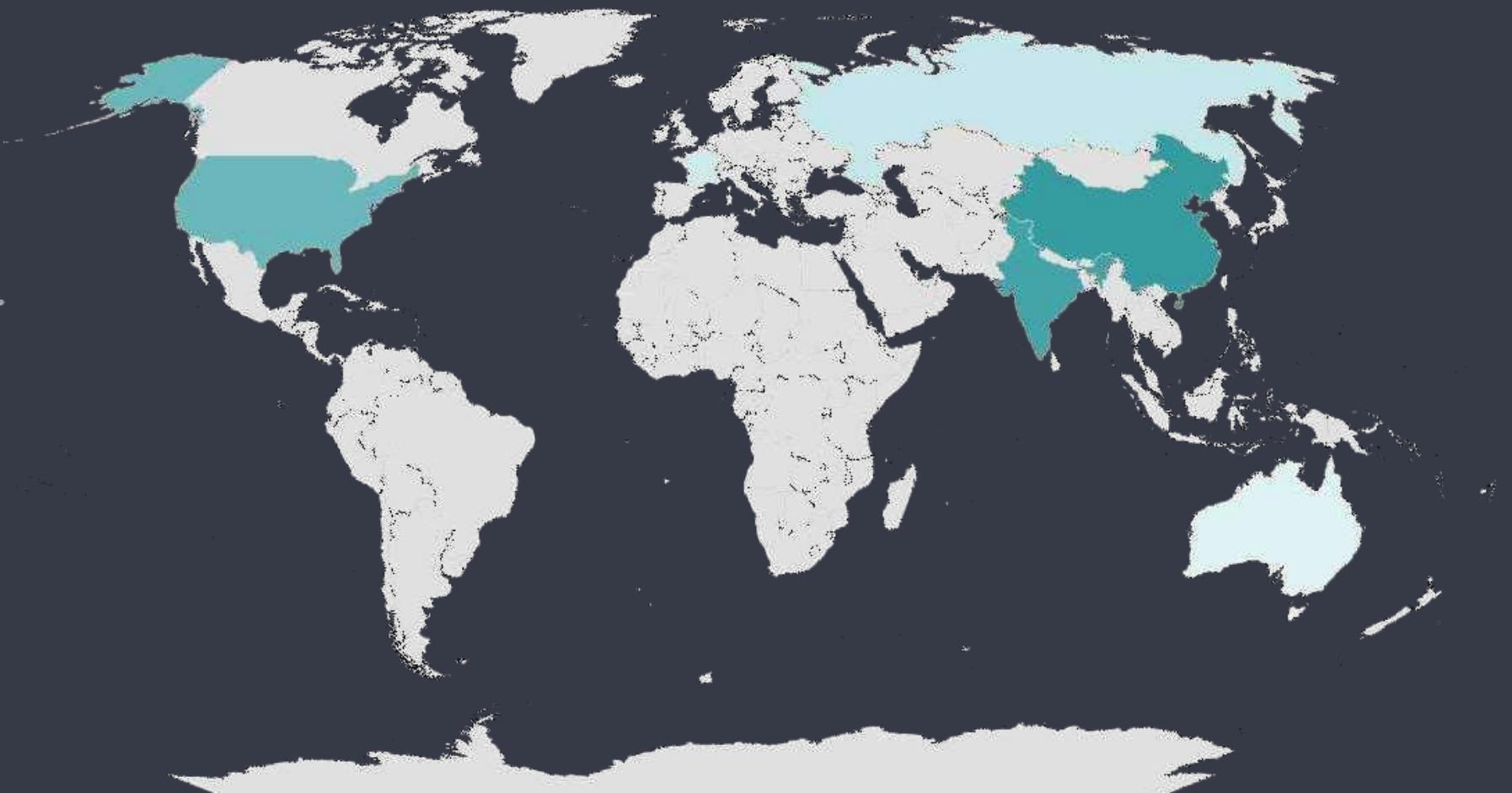
Growth of market annually

| Industry | Agriculture |
|----------|-------------|
| 4.2%     | 3.3%        |

## Market Share

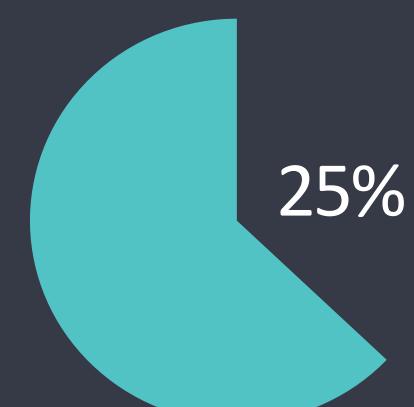
Our goal is to capture 10 percent of SAM which is 200 crore INR

World Distribution

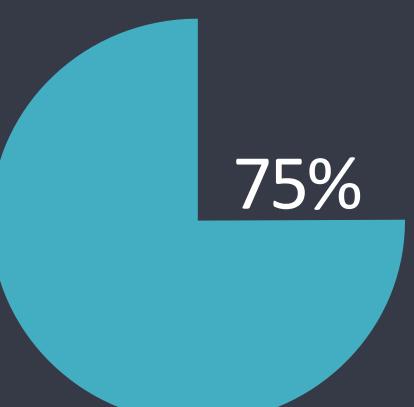


**20,000 Crore INR**  
Across the globe  
**2,000 crore INR**  
For Indian Industries  
**200 crore INR**  
From Deccan region

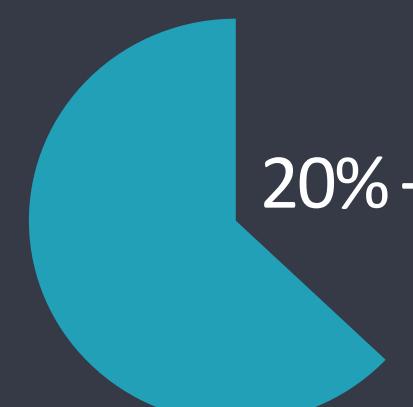
# Differentiator S.W.O.T Analysis



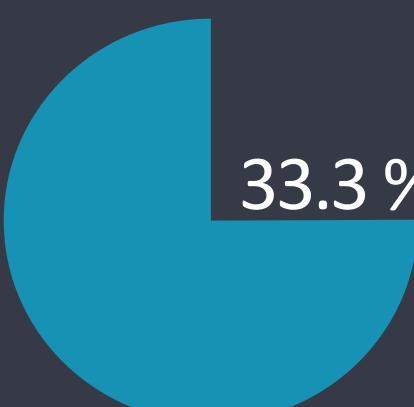
Reduction in dependence on resources



Increase in health and employability



Water saving



Increase in yield

## Strengths/USP

- Customized Filtration and analysis to cater to different industries
- Low Power and Low wastage
- Smart water, fertilizer, and pesticide allocation
- Eco Friendly and Sustainable

## Weakness

- Adoption requires extensive marketing
- Process is slightly time-consuming

## Opportunity

- Caters a huge market of 30.9 Billion USD or 20,000 Crore INR
- Paves the way to open algal farms and establish cosmetic products

## Threats

Suez and BioRock company are currently working with similar products

| FACTORS / COMPETITORS | PRICE Of filtrate | EFFICIENCY | POWER CONSUMPTION | FELEXIBILITY   | SERVICE                           |
|-----------------------|-------------------|------------|-------------------|--|-----------------------------------|
| KRISHI INSPIRO        | 750/-             | 8/10       | 2.5 kwatt/hour    | Ratio of algae can be modified depending on industry | Subscription                      |
| SUEZ                  | 2150/-            | 4/10       | 15 kwatt/hour     | LIMITED  | One time installment+ maintenance |
| BIO ROCK              | 1500/-            | 9/10       | 5 kwatt/hour      | Fixed, no changes                                    | Subscription                      |

<https://platform.tracxn.com/a/d/company/Sj7skCyhATdfoB7th8ns8MPmb6S-LHyw5OS7mPGLqk/suez.com>

[https://platform.tracxn.com/a/d/company/\\_j4eEilzwxO8CHmshT8HkgOpD8umpB7KNu3QPHkjN8U/bioroc#a:key-metrics](https://platform.tracxn.com/a/d/company/_j4eEilzwxO8CHmshT8HkgOpD8umpB7KNu3QPHkjN8U/bioroc#a:key-metrics)

# Razor blade Business Model

Nature of business: **B2B**

Target audience: **Petrochemical and Textile industries**

The average cost of product: **Rs 5500/-**

Services:

- 1. Tank installation(razor)**
- 2. Algae subscription(blade/repeat orders)**

| Sc.no | Item                             | Year 1    | Year 2    | Year 3    |
|-------|----------------------------------|-----------|-----------|-----------|
| 1     | Logistic cost                    | 1,50,000  | 4,00,000  | 10,00,000 |
| 2     | Raw material                     | 3,00,000  | 9,00,000  | 15,00,000 |
| 3     | Cost for office operation        | 1,00,000  | 1,50,000  | 2,00,000  |
| 4     | Electrification and installation | 2,00,000  | 2,00,000  | 2,00,000  |
| 6     | Variable operation cost          | 1,00,000  | 2,00,000  | 4,00,000  |
| 6     | Maintenance                      | 50,000    | 80,000    | 1,50,000  |
| 7     | Licence and Registration         | 2,00,000  | 2,00,000  | 2,00,000  |
| 8     | R & D                            | 10,00,000 | 15,00,000 | 25,00,000 |
| 9     | 1 Manager + 2 Supervisors        | 6,00,000  | 7,00,000  | 9,00,000  |
| 10    | 5 workers                        | 9,00,000  | 10,00,000 | 12,00,000 |
| Total | sum                              | 36,00,000 | 53,30,000 | 82,50,000 |

**Overall running cost for full operation**

## Unit Economics

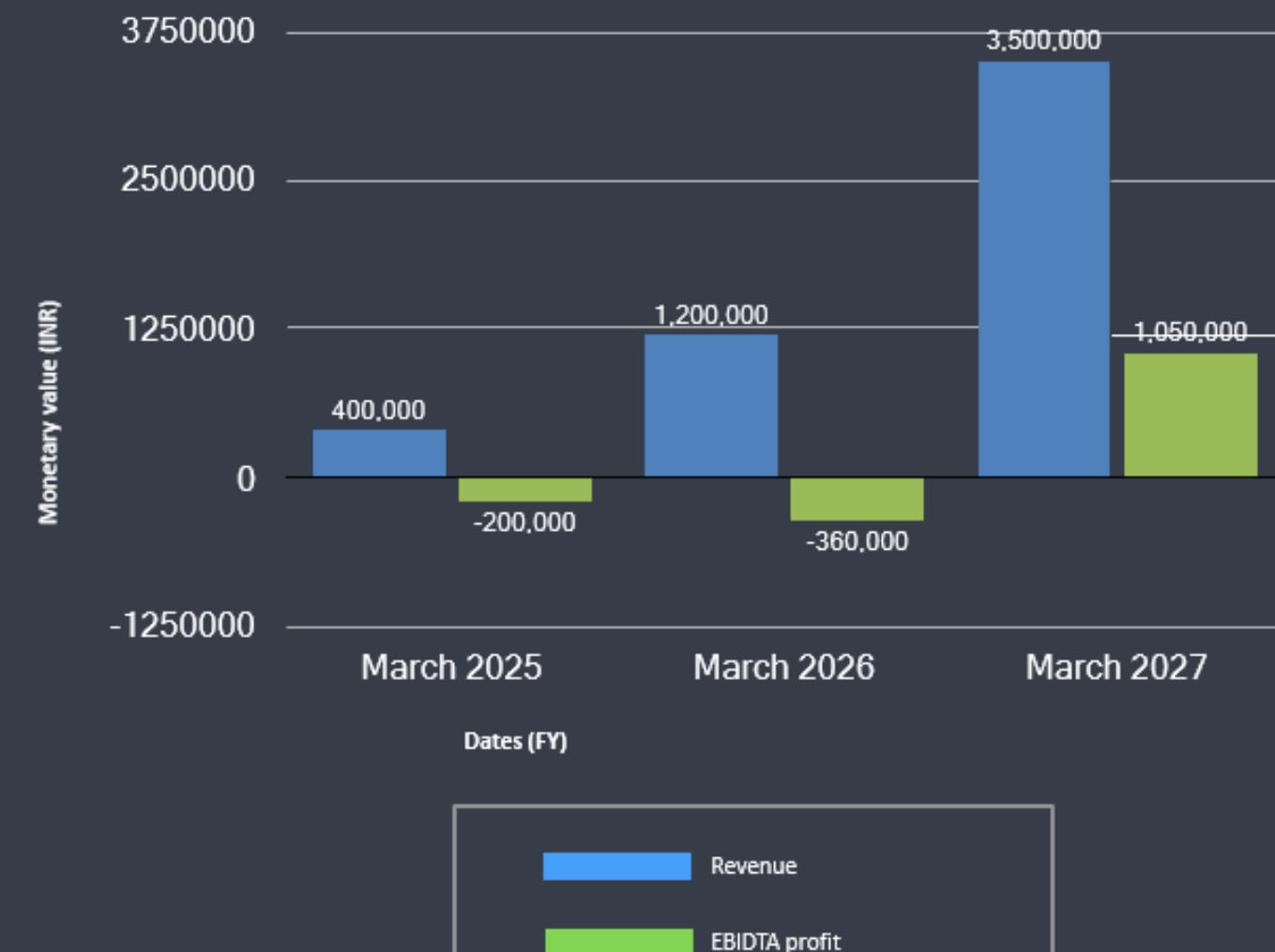


### Manufacturing Cost

- Tank cost: 60 Rs/kg
- Sensors: 350 Rs
- Microcontroller: 600 Rs
- Mesh Valve: 150 Rs
- Aerator: 350 Rs

Algae cost: 400 Rs/kg

Packaging cost: 50 Rs



# Financial Projections

Bootstrap Investment - 1 Lakh INR

Anticipated growth - 10%yyo

Break-even point- 2.5 years

Gross margin: 50%.

Manufacturing machines:  $3 \times 2,50,000 = 7,50,000$  INR

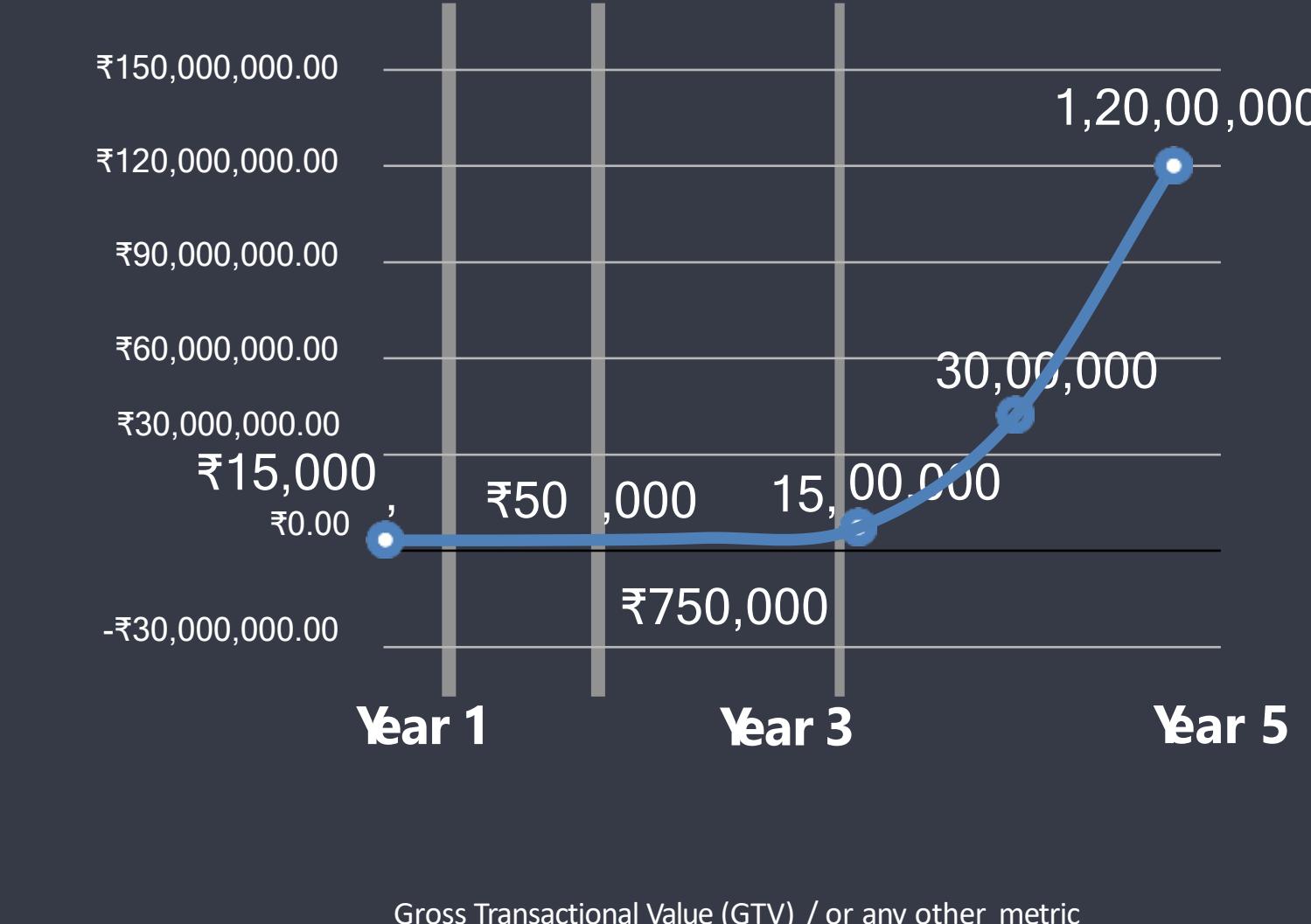
Sensors:  $10 \times 1000 = 10,000$  INR

Bank: 10,000 INR

Inventory: 1,00,000 INR

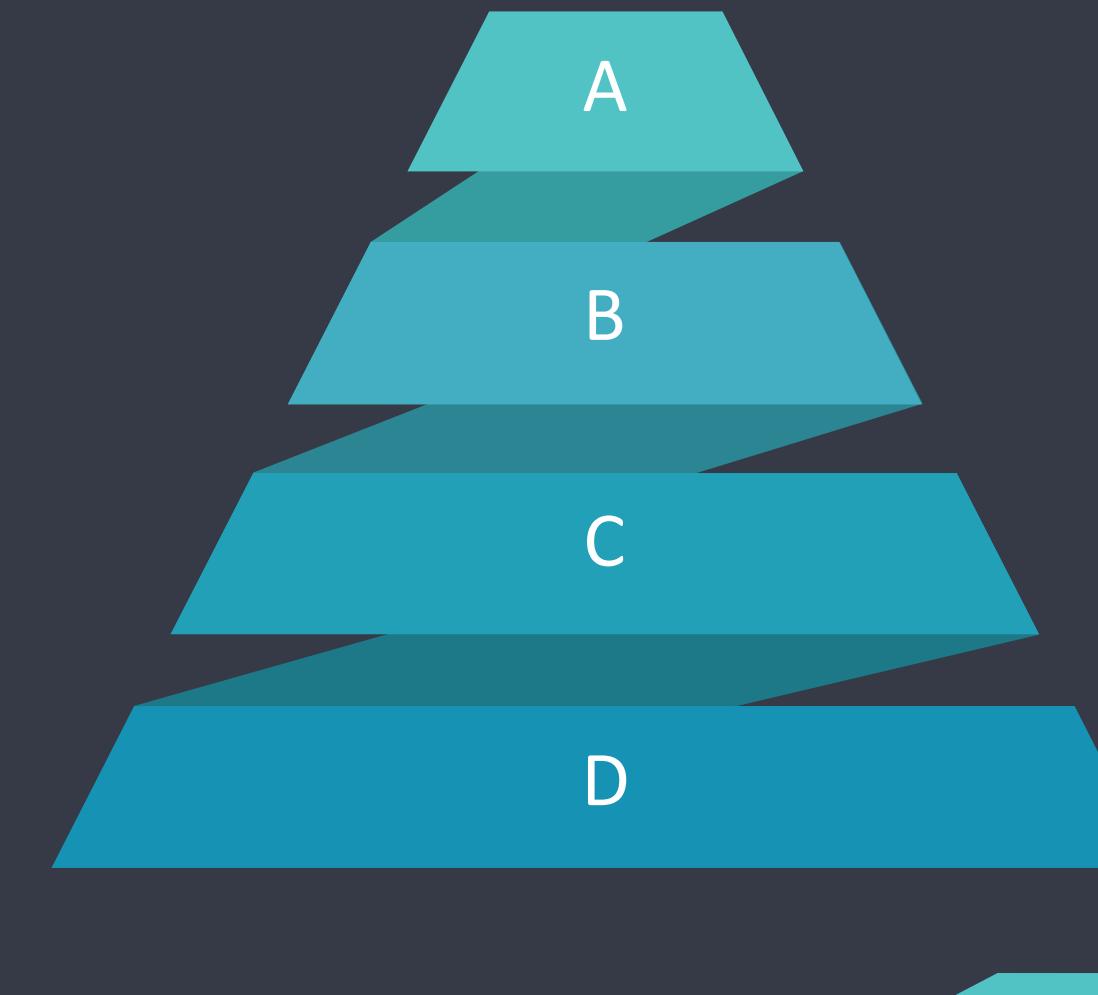
Raw Material and automation: 2,00,000 INR

Miscellaneous- 1,00,000 INR



## Razor Blade Subscription Model

To capture customers and obtain repeat rate



## Marketing by social media

Organic growth

## Create digital presence by website

Have social marketing in Instagram  
Collaborate with eco friendly events

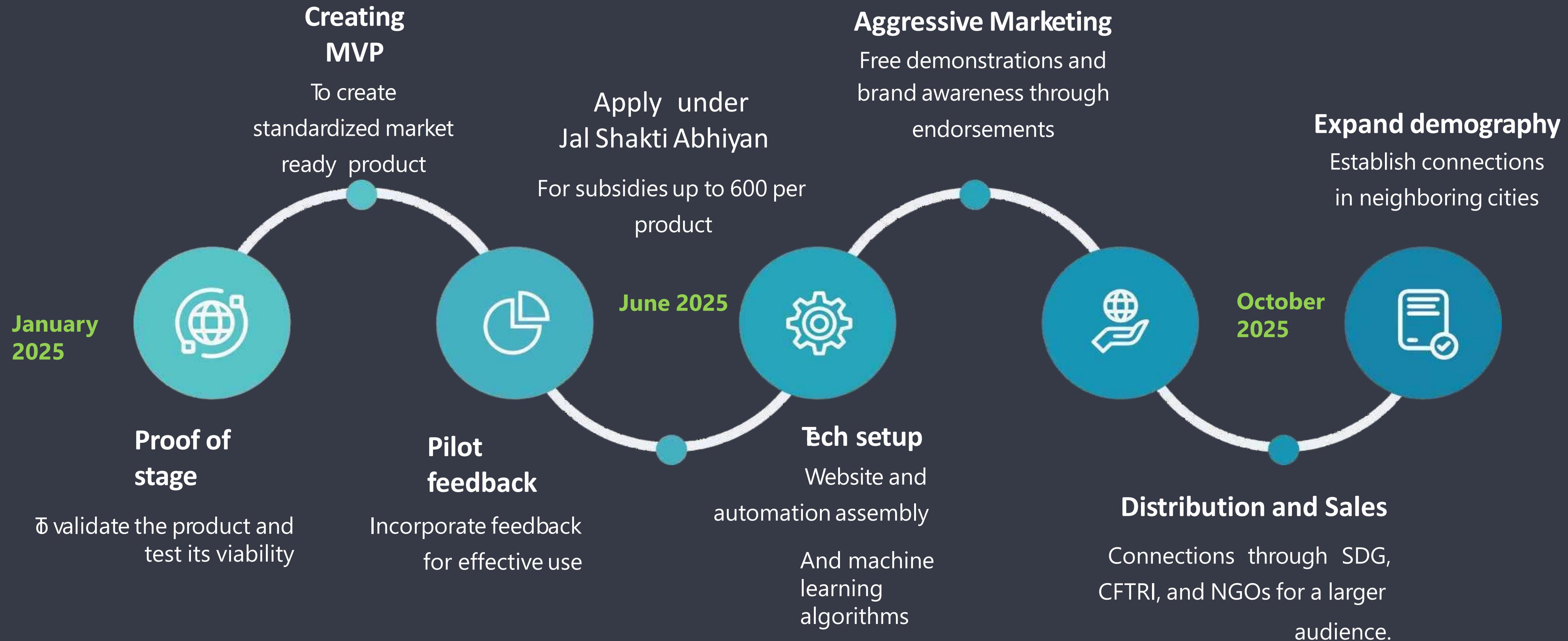


## Capture all Market places

And obtain maximum review



# Road Map



# Collaboration



The team thanks the Department of plant cell biotechnology (PCBT), CSIR-CFTRI, Mysuru for providing spirulina culture (CFR/SP6) culture and providing resources



## Achievements



The team has won B plan and technical competitions in IIT Madras, IIT Bombay Eureka, SIIB, IBS Pune.

## References:

Our Website link: <https://willowy-cat-2473ab.netlify.app/>

My research IEEE research paper: (paste only in google)

<https://drive.google.com/drive/folders/1kwEsBmp44616KGcmPIGenhjckqEjxSLZ?usp=sharing>

[www.ellenmacarthurfoundation.org](http://www.ellenmacarthurfoundation.org)

Wikipedia [www.researchgate.net](http://www.researchgate.net)