

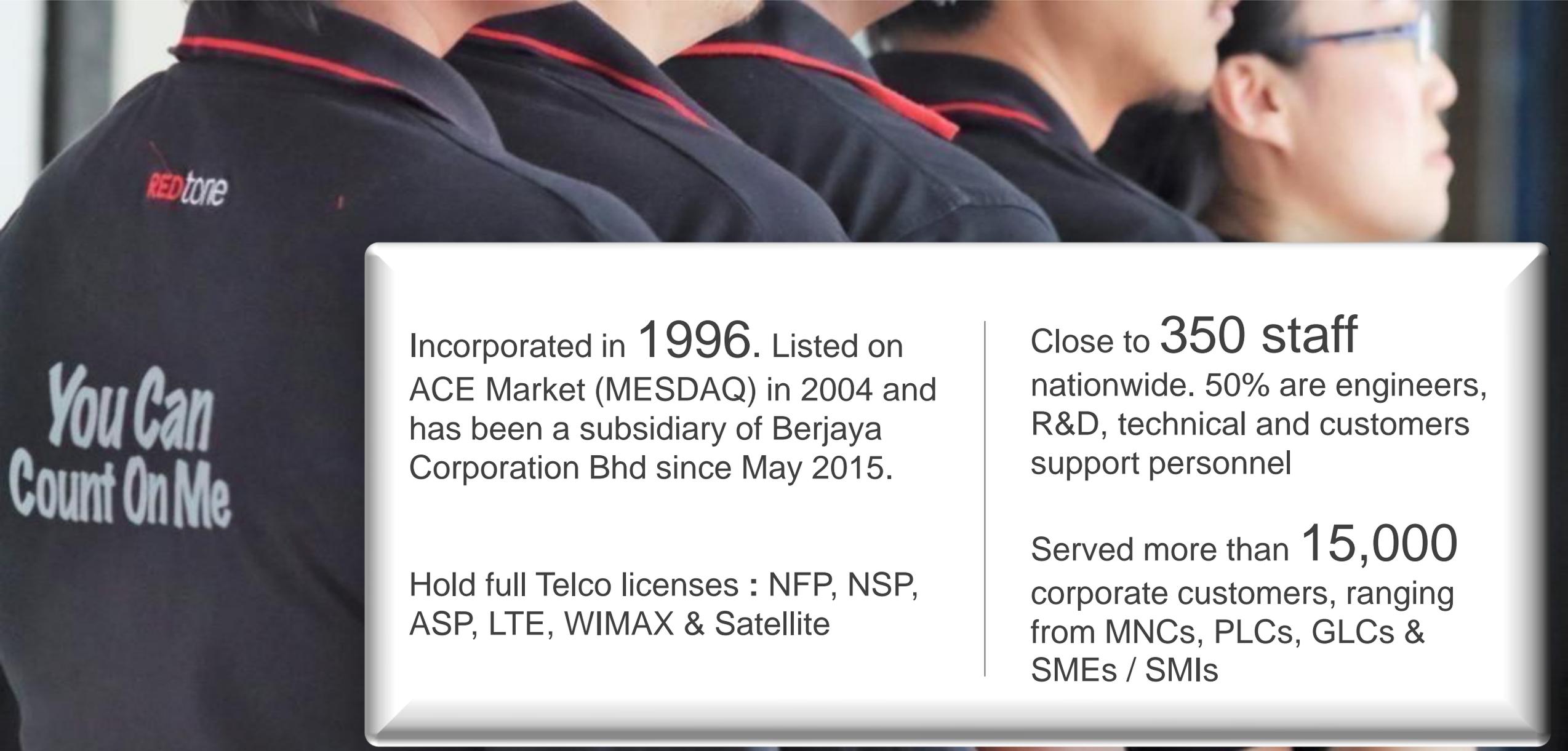


**RED**tone **SMART FARMING**

# Smart Farming – Smart Fertigation



# About Us



Incorporated in **1996**. Listed on ACE Market (MESDAQ) in 2004 and has been a subsidiary of Berjaya Corporation Bhd since May 2015.

Hold full Telco licenses : NFP, NSP, ASP, LTE, WIMAX & Satellite

Close to **350 staff** nationwide. 50% are engineers, R&D, technical and customers support personnel

Served more than **15,000** corporate customers, ranging from MNCs, PLCs, GLCs & SMEs / SMIs

# Our Awards & Accolades

39 awards won over the past 24 years



**2019**  
Global AgriTech Awards  
Best Smart Farming  
Technology



**2016**  
FROST AND SULLIVAN AWARD  
Malaysia Innovative Smart City  
Solution Provider of the Year

**2009, 2007, 2005**  
Alternative Voice Service  
Provider of the Year



**2019, 2016, 2001**  
APICTA  
ASIA PACIFIC ICT  
AWARDS  
Industrial:  
Agriculture (2019)  
Best of e-  
Government &  
Public Sector – Merit  
Award (2016)  
Best of  
Communications  
Applications (2001)



**2019**  
CSR Malaysia  
Awards  
Integrated  
Telecommunications



**2019**  
ASIA RESPONSIBLE  
ENTERPRISE AWARDS  
(AREA)  
“Social Empowerment”  
category



**2018**  
INTERNATIONAL  
FINANCE AWARDS  
The Most Innovative  
Telecom Company



**2017**  
APAC CIO  
Top 25 APAC Cyber  
Security Solutions  
Providers (2017)

# 3 Pillars Of Growth

## Telecommunications Services

- Broadband & Corporate Internet
- Managed Services
- Voice

## Managed Telco Network Services

- Large Scale Wi-Fi
- Telco Engineering

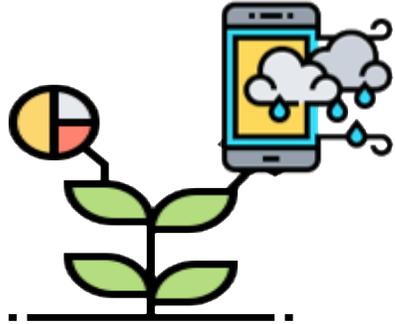
## Industry Digital Services

- Cloud, Data Centre & VR
- Internet Of Things - Smart Farming
- Healthcare



# Industry Digital Services

## IoT / Smart Farming

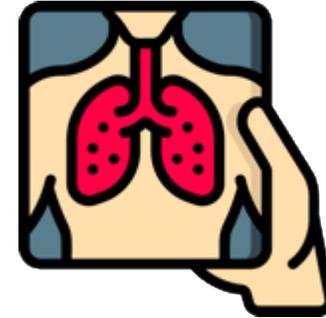


Winner of Malaysia **APICTA Award 2019** -  
“**Best Industrial Provider for the Agriculture Sector**”

Empower smallholder and youth - adopt **technology, increase yields and reduce costs.**

- An **integrated IoT platform**
  - Remote monitoring
  - Automation
  - Remote control

## e-Health



Allows radiologists to read 2D & 3D scan images loselessly in real-time over mobile networks to provide 24/7, onsite & offsite radiology reporting services.

Won **RM130 mil contract** to provide nationwide medical imaging, filmless radiology information system infrastructure and network connectivity to **20 of the largest hospitals in Sri Lanka**, including the national hospital in Colombo.



How do we support businesses to leverage Digital & EMERGE STRONGER?



# Digital Transformation Journey:

The 3 Elements of Exceptional Execution

## Training:

Company-Wide Performance Boost



1st Step to DX journey. Elevate digital capabilities and know-how

## Consultancy:

Strategic Formulation



Identify pain points & high value opportunities. Establish frameworks, roadmap & strategies.

## Implementation:

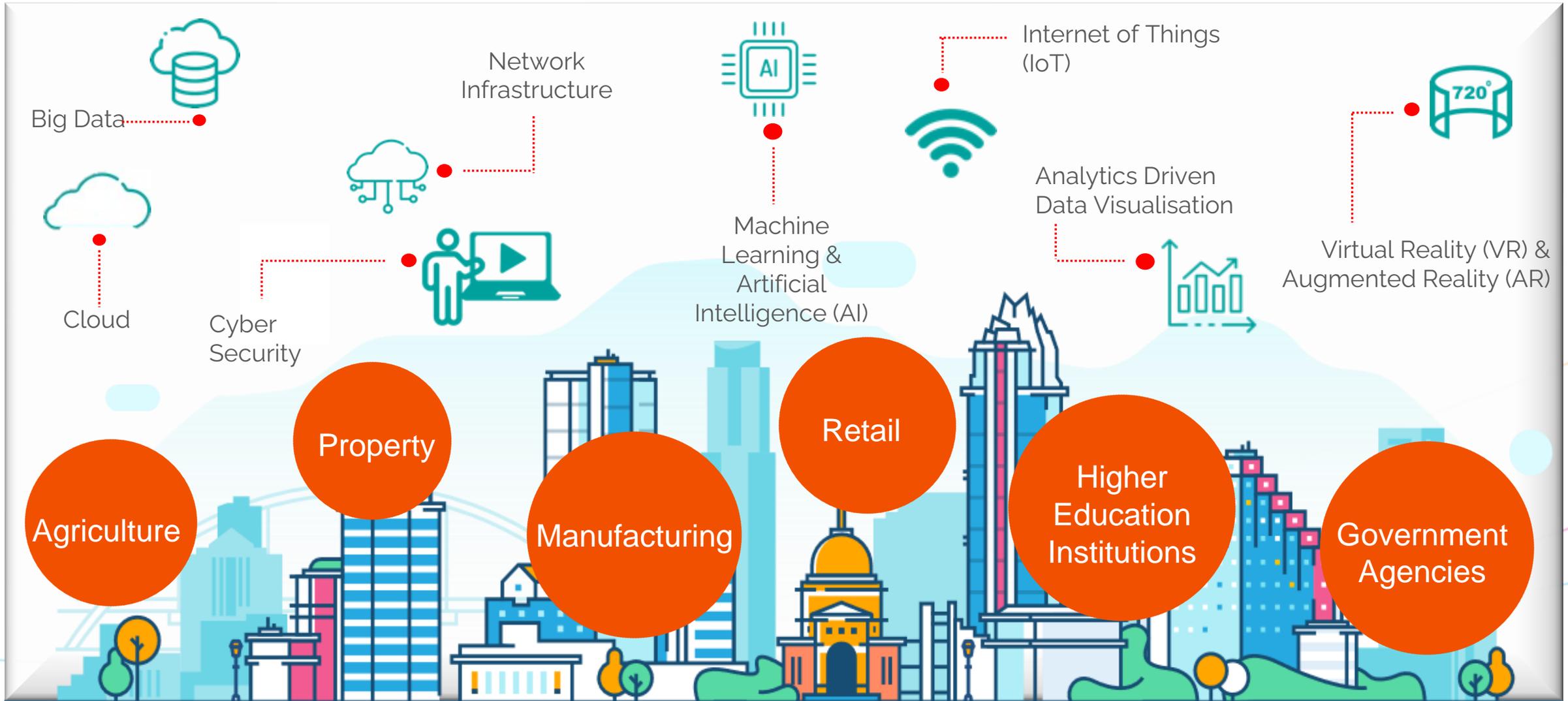
Tech Enabled Business Transformation



Fuelled by data, embrace technologies at scale for business growth & operational efficiency

# End-to-End Components

## Across Myriad Industries



# REDtone SMARTFARMING



# Sustainability Issues



**70%** of fresh water used in Agriculture.



**39%** water shortage 2030



**9.8 Billion** Population by 2050



**70%** Increase of food production from 2007-2050



**5%** Cropland are irrigated .



**40.7 Million** Population by 2050



**> 90%** Of crops cultivated by smallholder



**8.2%** Decrease in farming employment annually



**18.4 Billion** Food export deficit in 2015

# Projected Evolution Of Smart Farming In Malaysia

## Phase 1

- Farm Data Collection, Automation, Control

## Phase 2

- Drone Utilization, Satellite Data Collection, Track & Trace

## Phase 3

- Big Data Analytics & Machine Learning (AI)

## Phase 4

- Farm Aggregation, Mechanization



# Problem Statement

Smallholder farmers have **NO ACCESS TO MODERN AGRICULTURE TECHNOLOGIES**

**65% of smallholder farmers to retire in the next 15 years.  
Next Generation?**

**High wastage – inefficient use of resources**

**Growing population vs limited resources**  
- We have a national food security problem.

**High dependency on foreign labor**



1. **In-house developed, integrated cloud-based IoT platform**

- Remote monitoring
- Automation
- Remote control

2. These solutions are aimed at:

- **Increasing Yields**
- **Reducing Labor Costs**
- **Reducing Material Costs**

3. To make farming SEXY, so that we can attract and train a new generation of growers.



# The Technology

1. Designed to be **user friendly UI**.
2. **Set & forget system**.
3. Cloud based system allows for **high availability and reliability**.
4. **Global security standards compliance** as platform is based in REDtone's cloud infrastructure.
5. **Proven technologies** suitable for harsh environments.



Cert. No. ISM 00292  
ISO/IEC 27001:2013

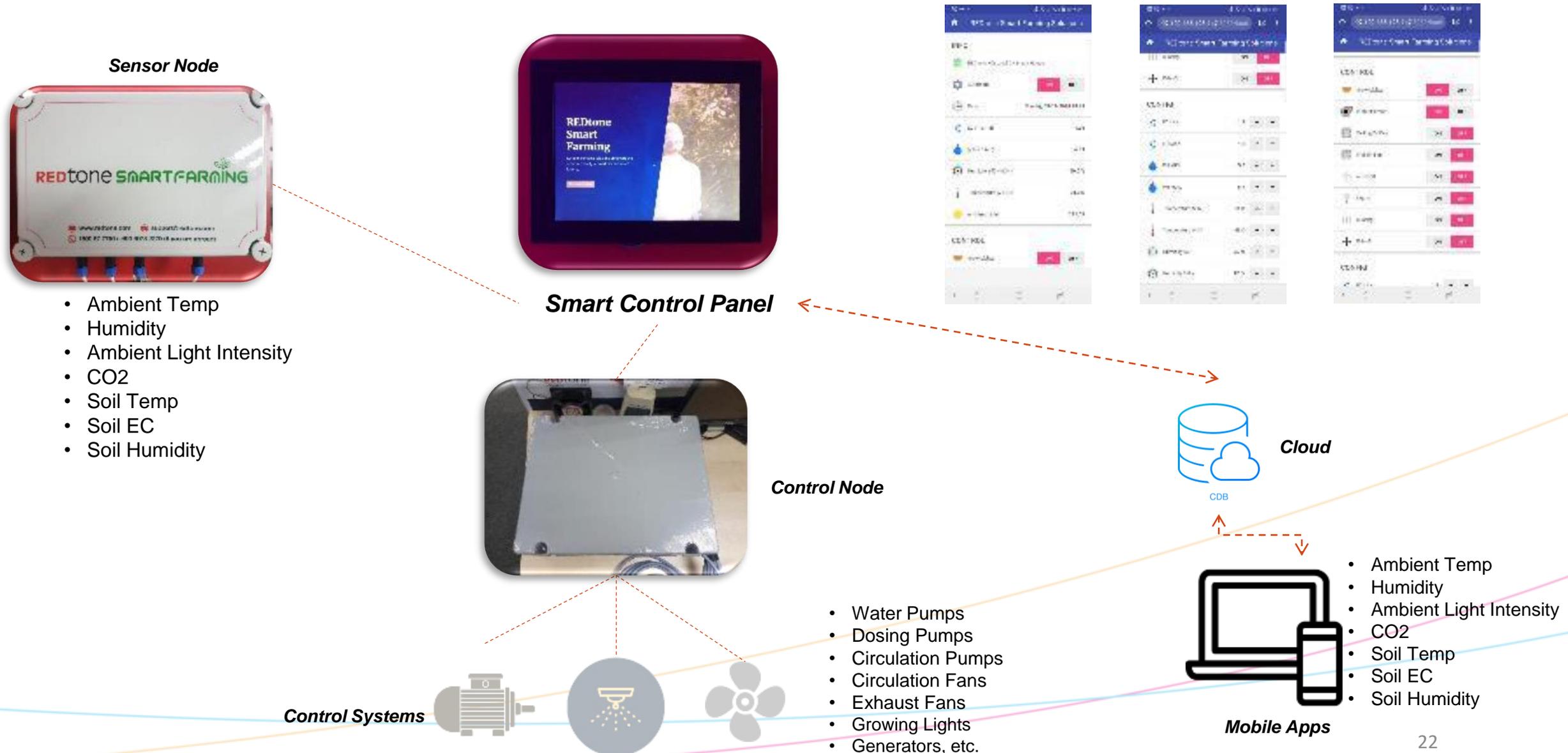
ISO/IEC 27001:2013  
Information Security  
Management Systems



Certificate No: WLD1903C  
Classification: Service Provider

PCI DSS (Payment Card Industry  
Data Security Standard)

# REDtone Smart Farming Solution



# REDtone Smart Farming Solution



## SF-1000 Single Phase

### Smart Fertigation System



#### Sensors Included:



Water EC



Water pH



Water Level



Ambient  
(T, L, H)

#### Standard Package:

- CPU x 1
- SF-P-105: Peristaltic Pump x 2
- Sensor Slots x 6
- SF-WS-100: EC Sensor & Controller x 1
- SF-WS-101: Water pH & Controller x 1
- Control Slots x 8
- \*Max 16 Control Slots

#### 4 Sensor Package:

- SF-WS-102: Water Level x 3
- SF-ES-101: Ambient x 1 (Temp, Light, Humidity)

#### Mixing Pump:

- SF-P-100: 2HP Water Pump x 1



# REDtone Smart Farming Solution



## SF-2200 Three Phase

### Smart Fertigation System



#### Sensors Included:



Water EC



Water pH



Water Level



Ambient  
(T, L, H)



#### Standard Package:

- 8" Touch Screen CPU Control Panel x 1
- SF-P-105: Peristaltic Pump x 2
- Sensor Slots x 6
- SF-WS-100: EC Sensor & Controller x 1
- SF-WS-101: Water pH & Controller x 1
- Control Slots x 8
- \*Max 32 Control Slots

#### 4 Sensor Package:

- SF-WS-102: Water Level x 3
- SF-ES-101: Ambient x 1(Temp, Light, Humidity)

#### Mixing Pump:

- SF-P-100: 2HP Water Pump x 1

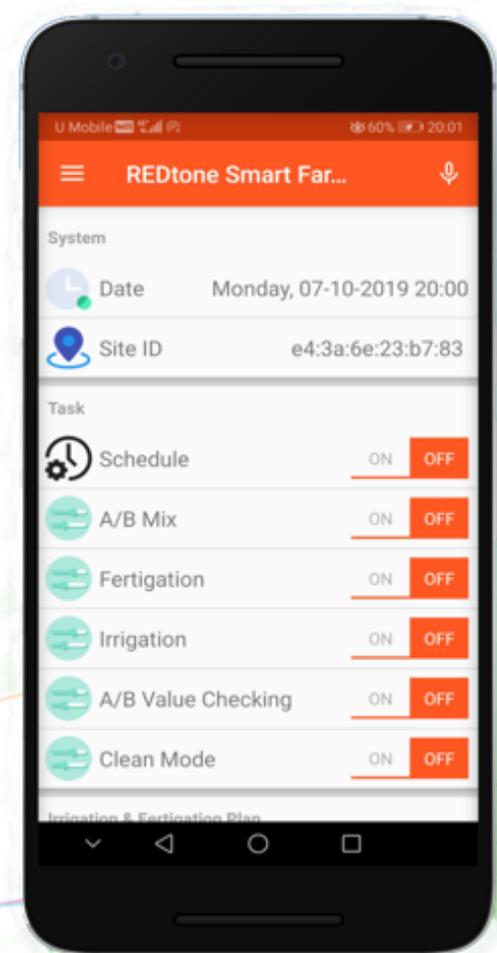
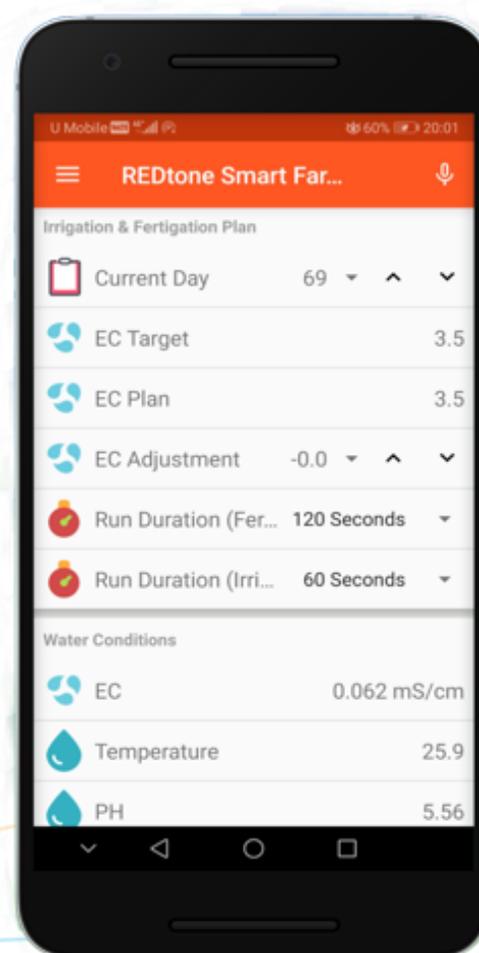
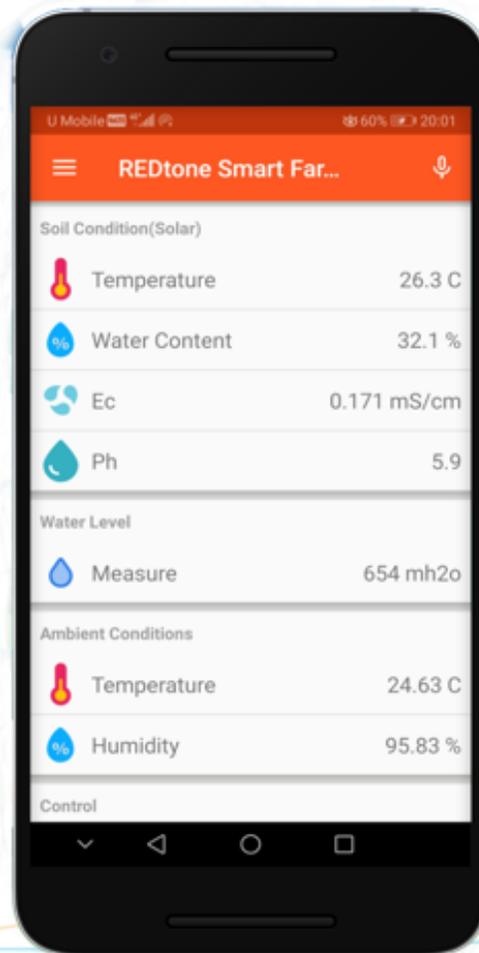
# Additional Components

| Control Node   | DB Box   | Sensor Node  | Sensor Node  | Sensor Node  |
|--|--|--|--|--|
|                                     |    |                                     |                                     |                                   |
| <p><b>CN-1000:</b></p> <ul style="list-style-type: none"> <li>Control Node</li> <li>Control Slots 16A x 8</li> </ul> | <p><b>DB-3000-4-CPU:</b></p> <ul style="list-style-type: none"> <li>DB Box Three Phase - 8" Touch Screen Control Panel</li> <li>Control Slots x 8</li> </ul> | <p><b>SN-1000-LR:</b></p> <ul style="list-style-type: none"> <li>Sensor Node Lora</li> <li>Sensor Slots x 6</li> </ul> | <p><b>SN-1000-WL:</b></p> <ul style="list-style-type: none"> <li>Sensor Node WiFi</li> <li>Sensor Slots x 6</li> </ul> | <p><b>SN-1000-4G:</b></p> <ul style="list-style-type: none"> <li>Sensor Node 4G</li> <li>Sensor Slots x 6</li> </ul> |

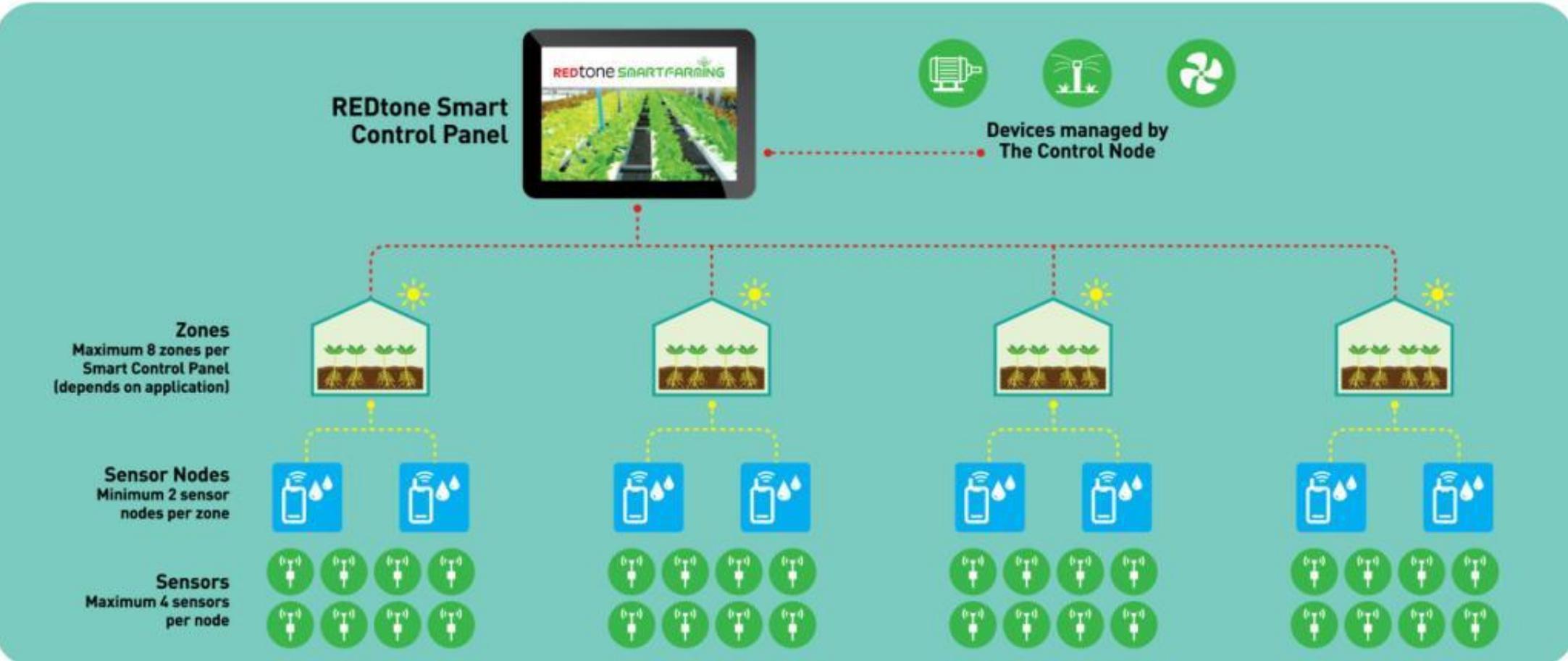
# Additional Components

| Battery Module   | Solar Panel Module  | Mixing Pump   | Mixing Pump  | Mixing Pump   | Mixing Pump  | Mixing Pump   | Mixing Pump   |
|--|---|---|--|---|--|---|---|
|   |          |   |   |    |   |    |  |
| <b>SF-BM-100:</b> <ul style="list-style-type: none"> <li>Battery Module</li> </ul> | <b>SM-1000-41AH:</b> <ul style="list-style-type: none"> <li>Solar Panel Module</li> </ul> | <b>SF-P-100:</b> <ul style="list-style-type: none"> <li>2HP Water Pump</li> <li>INLET / OUTLET PORT ; 2" X 2"MAX. FLOW ; 500 L/MIN</li> <li>VOLTAGE : 220 ~ 240 VAC / 50Hz</li> </ul> | <b>SF-P-101:</b> <ul style="list-style-type: none"> <li>1HP Water Pump</li> <li>MAX. FLOW : 100 L/MIN</li> <li>VOLTAGE : 220 ~ 240 VAC / 50Hz</li> </ul> | <b>SF-P-102:</b> <ul style="list-style-type: none"> <li>0.5HP Water Pump</li> <li>Max flow rate: 40L/min</li> <li>VOLTAGE : 220 ~ 240 VAC / 50Hz</li> </ul> | <b>SF-P-103:</b> <ul style="list-style-type: none"> <li>1HP Submersible Water Pump</li> <li>Max capacity 300L/min (18m3/hour)</li> <li>Voltage 220V~240V 50Hz</li> </ul> | <b>SF-P-104:</b> <ul style="list-style-type: none"> <li>0.5HP Submersible Water Pump</li> <li>Max capacity 25-120L/min</li> <li>Voltage 220V~240V 50Hz</li> </ul> | <b>SF-P-105:</b> <ul style="list-style-type: none"> <li>Peristaltic Pump</li> </ul> |

# Visual Interface



# System Architecture



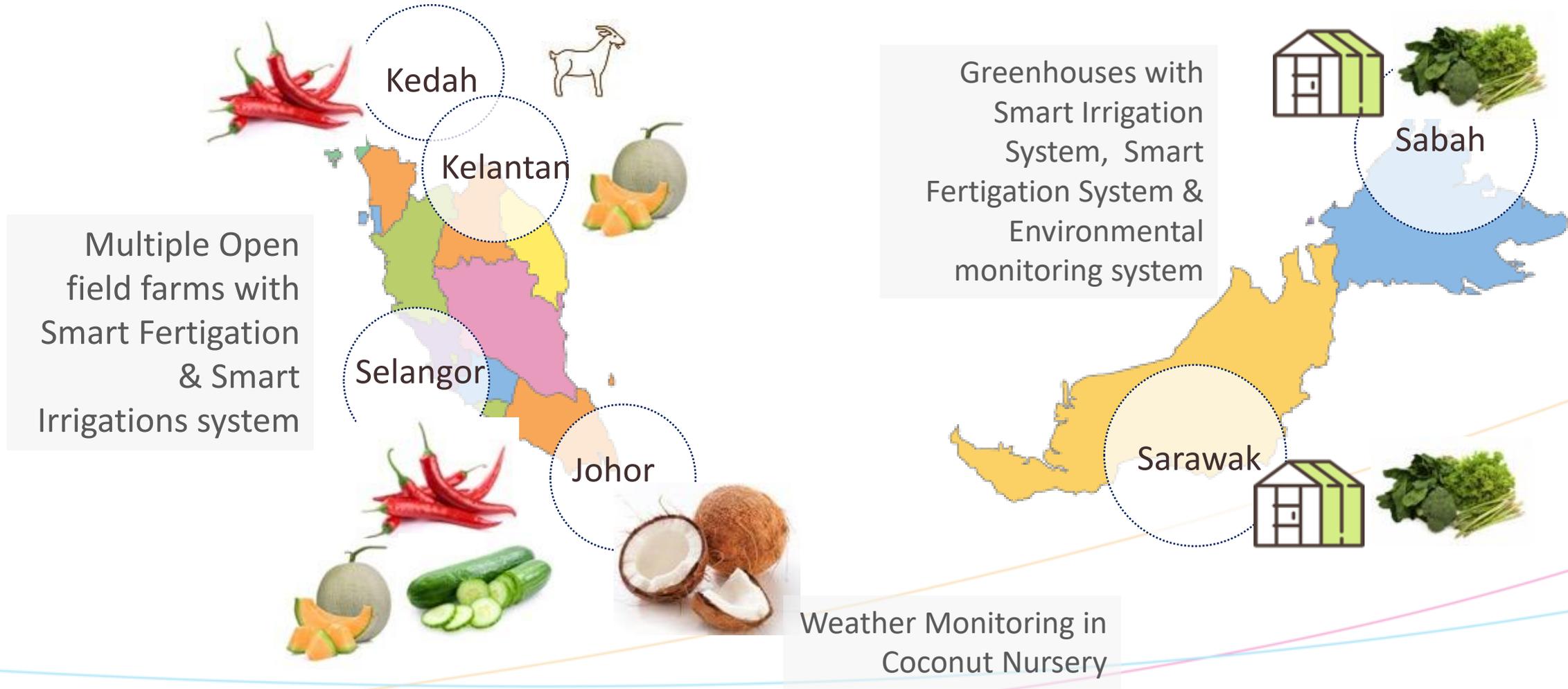


# REDtone Smartfarming Implementation

- Smart Greenhouse
- Open Fertigation System
- Vertical Farming
- Digital Swiftlet Farming
- Aquafarming



# Current Smart Farming Deployments



# Our Deployments

## Vertical NFT Vegetable Farm - Selangor

### REDtone Smart Vertical Farming System

- Automated NFT Dosing
- Automated environmental controls:
  - Circulation Fan
  - Exhaust Fan
  - Lighting
  - Air Conditioning
  - Circulation Pump
- Sensors:
  - Air Temp
  - Humidity
  - Light Intensity



# Our Deployments

## NFT Vegetable Greenhouse - Sarawak



### REDtone Smart Pesticide Misting System

- Vegetable Greenhouse
- Automated pesticide misting and controls circulation fans.
- Sensors:
  - Air Temp, Humidity.



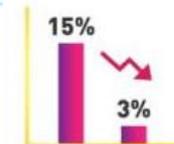
#### PESTICIDE FREQUENCY

Reduced from 3 times to 1 time per week



#### PESTICIDE USAGE

Reduced from 540L to 280L per cycle



#### CROP DAMAGE RATE

Reduced from 15% to 3%

# Our Deployments

## Open Field Rock Melon Farm - Selangor

### REDtone Smart Fertigation System

- Rock Melon Farm
- Automated Fertigation and Remote Control & Monitoring System
- Sensors:
  - Environmental: Air Temp, Humidity
  - Soil: Temp, Humidity, pH & EC
  - Water: EC & pH



**MANUAL FERTILISER MIXING PROCESS**

- Fully dependent on workers
- Prone to human error and inconsistency

**AUTOMATED MIXING SYSTEM FOLLOWING SOPs**

- Accurate, uniform and precise applications
- Improves uptake
- Saves fertiliser usage by 30%



**NO RECORD OF FERTILISER MIXING**

- Unknown quantity

**FERTIGATION TANK (EC CHART)**

- EC level is well managed according to set parameters

# Our Deployments

## Rooftop Drip Fertigation Chili Farm - Putrajaya

- REDtone Smart Fertigation System
  - Chilli POC Farm
  - Remote Monitoring, Automated Fertigation, & Remote Control System
  - Sensors:
    - Environmental: Air Temp, Humidity
    - Soil: Temp, Humidity, pH & EC
    - Water: EC & pH





Fahniah kepada Ratu Rock Malaysia, Ella dan suaminya E. Azhar Ghazali. Semoga terus berjaya dan merencanakan lagi industri pertanian di Selangor.



# Our Deployments

## Drip Fertigation Chili Farm - Selangor

- REDtone Smart Fertigation System
  - Chilli Farm
  - Remote Monitoring, Automated Fertigation, & Remote Control System
  - Sensors:
    - Environmental: Air Temp, Humidity
    - Soil: Temp, Humidity, pH & EC
    - Water: Water Level, EC & pH



# Our Deployments

## Vertical NFT Vegetable Farm - Selangor

### Smart Vertical NFT System

- Vegetable NFT (at Café)
- Remote Monitoring, Automated Fertigation, & Remote Control System
- Sensors:
  - Water: EC, Water Level
  - Environmental: Air Temp, Humidity



RED TONE SMART FARMING



| BEFORE  | AFTER   |
|---|---|
| <p><b>1. Manual Fertiliser Mixing Process</b></p> <ul style="list-style-type: none"> <li>• Fully dependent on workers</li> <li>• Errors and inconsistency were unavoidable</li> </ul>   | <p><b>1. Automated Mixing Process According to SOPs</b></p> <ul style="list-style-type: none"> <li>• Accurate, uniform and precise as per EC target</li> <li>• Crops are well nourished</li> </ul>  |
| <p><b>2. Inconsistency in Yield Weight</b></p> <ul style="list-style-type: none"> <li>• Average 200gm to 210gm per bunch of salad</li> </ul>  <p>201g</p> | <p><b>2. Yield Weight Increased by 50%</b></p> <ul style="list-style-type: none"> <li>• From 201g (previous cycle) to 293gm per bunch of salad</li> </ul>  <p>293g</p> |
| <p><b>3. Manual EC Target Checking</b></p> <ul style="list-style-type: none"> <li>• Assigned a worker to manually check the EC target twice a day</li> </ul>  | <p><b>3. Automated EC Target Checking</b></p> <ul style="list-style-type: none"> <li>• No manual checking required; all data monitored via mobile phone and dashboard</li> </ul>  |



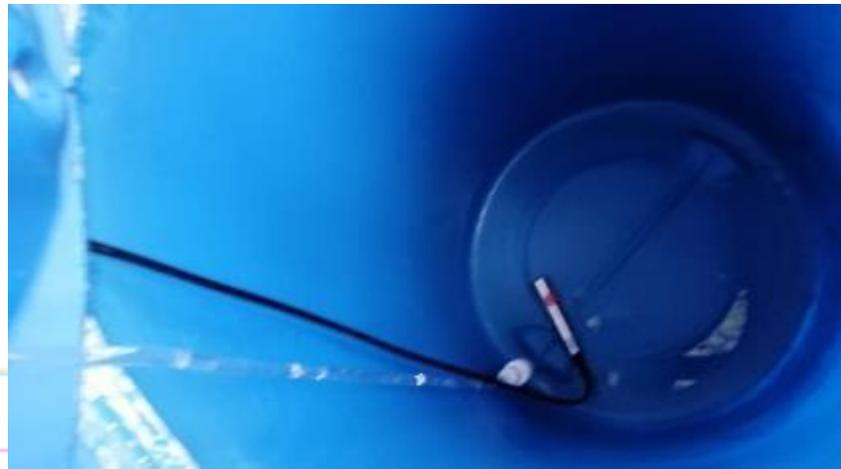
**REDtone SMART FARMING**

# Our Deployments

Bedding Vegetable Farm - Sabah

## Smart Bedding Fertigation System

- Vegetable Greenhouse
- Remote Monitoring, Automated Fertigation, & Remote Control System
- Sensors:
  - Water: EC, Water Level
  - Environmental: Air Temp, Humidity



# Our Deployments

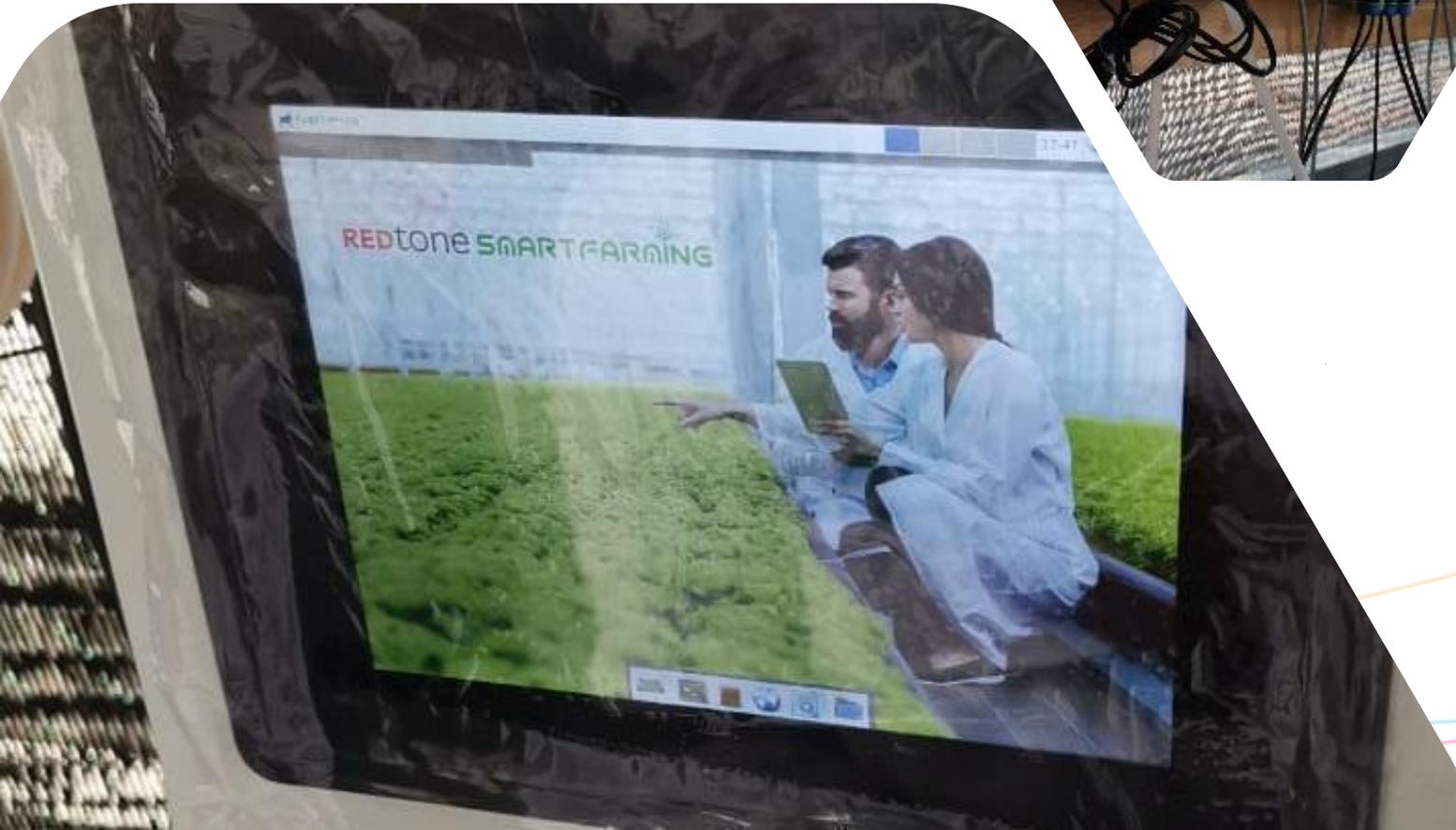
## Drip Fertigation Cucumber Farm - Kedah

- **REDtone Smart Fertigation System**
  - Cucumber Farm
  - Remote Monitoring, Automated Fertigation, & Remote Control System
  - Sensors:
    - Environmental: Air Temp, Humidity
    - Soil: Temp, Humidity, pH & EC
    - Water: Water Level, EC & pH



# Our Deployments NFT Vegetable Greenhouse - Indonesia

- **Smart GreenHouse NFT System**
- Vegetable NFT
- Remote Monitoring, Automated Fertigation, & Remote Control System
- Sensors:
  - Water: EC, Water Level
  - Environmental: Air Temp, Humidity, Light Intensity



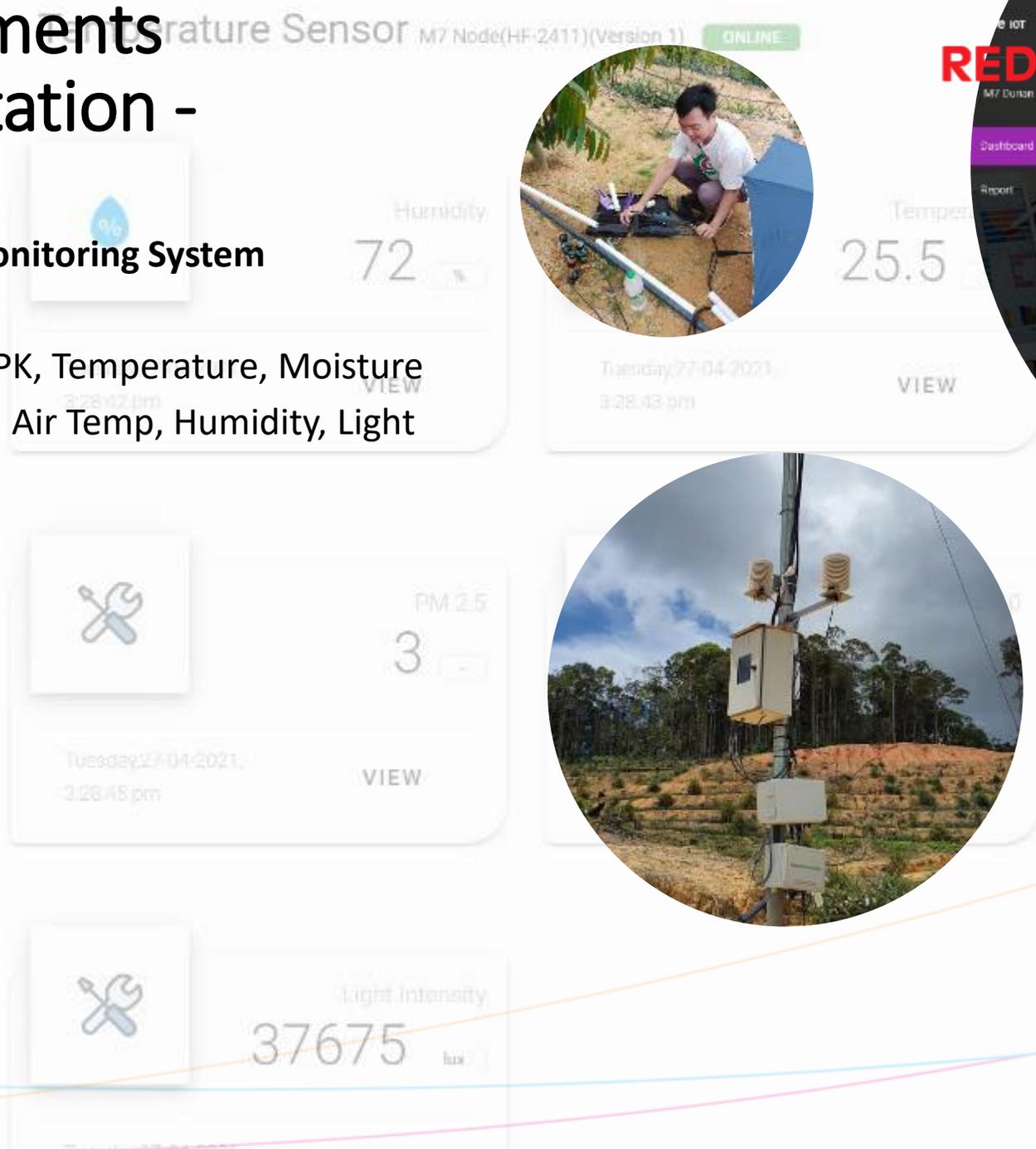
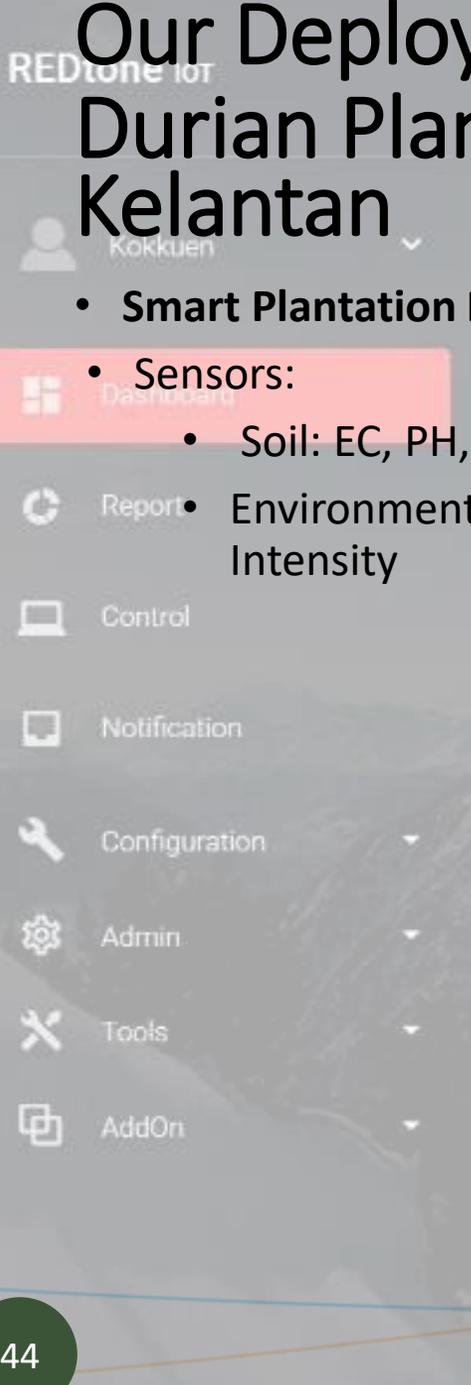
# Our Deployments

## Durian Plantation - Kelantan

- Smart Plantation Monitoring System

- Sensors:

- Soil: EC, PH, NPK, Temperature, Moisture
- Environmental: Air Temp, Humidity, Light Intensity



# Other Smart Farming Solutions

REDtone

## IOT-BASED / SMART FARMING SOLUTIONS FOR DURIAN FARMS

- Integration of end-to-end IoT solutions with traditional techniques which have been proven to be successful



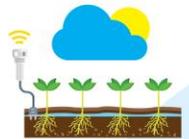
- Increase yield / production
- Real-time data and insights
- Remote monitoring
- Accelerate decision-making
- Lower operational costs



- Plan fruiting cycle
- Increase yield value



### AGRICULTURE MEETS TECHNOLOGY FROM FARM TO RETAIL



Weather Prediction, Water & Soil Monitoring Sensors To Maintain A Perfect Microclimate And Environment For Optimal Plant Growth

- Moisture and nutrient monitoring
- Water usage monitoring
- Efficient fertilisation and chemical composition monitoring
- Weather condition monitoring



CCTV Monitoring

- From 3G / 4G wireless to deployment of satellite in the most remote areas
- 24/7 remote access via mobile / tablets
- Intruder monitoring and theft deterrence especially for fertiliser inventory and daily operations monitoring



Ultrasonic Intrusion Detection Sensor

- Ultrasonic waves attack the auditory system of animals, e.g. monkeys and squirrels, causing discomfort
- Effectively get rid of animal menace and nuisance from early growth to fruiting stages

Product Tracking, Distribution Tracing & Analytics

- Tracking system that checks the authenticity, place of origin, packaging date and logistics information
- IoT is used to facilitate real-time tracking; solution enables farms to trace the tree of origin for each durian product

- Digital Plantation Monitoring for cultivation of cash crops such as Palm Oil, Durian, Rubber Trees, Coconut Trees, etc..
- Digital Mushroom Cultivation Monitoring & Control.



# Environmental Monitoring



- A cost-effective system to monitor environmental conditions.
- Variables monitored include:
  - Ambient Temperature
  - Air Pollution
  - Water Quality:
    - Dissolved Oxygen
    - pH
    - Temperature
    - Chemical Content (Subject To Requirements)



# Smart Poultry Monitoring System

## Suggested Sensors

### 1. Temperature and Humidity Sensor

- Indicator to triggered exhaust fans, curtain or heater for broiler accordingly to the growth phase (starter : grower : finisher)
- Can helps provide the comfortable ambient to the broiler. Improve FCR due comprehensive conditions.

### 2. Ambient Ammonia Sensor

- Helps to monitor ammonia gas that emit from the chicken dung.
- Can triggered any system to overcome the excessive ammonia level in chicken barn.
- Reduce breaks of diseases and mortality.

### 3. Water Quality Sensor

- To monitor the quality of the water based on parameters such as temperature, pH, turbidity, etc.

FCR↑



# Smart Paddy Farming

## Water Supply Shortage

### The Problem:

- Drainage/ Watering of paddy plots requires a lot of water.
- Water discharge outtake can be easily adjusted by the farmers, causing shortages on neighboring plots.
- No real-time monitoring of the water discharge controls.

### The Solution:

- Option 1: Fully Automated Control System – Automated water level monitoring and automated control of water pumps & solenoid valves to optimize water distribution.
- Option 2: Semi- Automated Control System – Automated water level monitoring. Each paddy plot's water level is monitored by the system and once the outtake pipe is adjusted without authorization or the water level rises beyond a certain limit, an alert notification will be triggered to the monitoring officer.



# Smart Poultry Monitoring System

## Suggested Solution

### 1. Automatic EM Misting

- Automatic Effective Microbes (EM) mixing and misting in the chicken barn in order to reduce ammonia gas and control outbreak of diseases.
- Misting can be managed by schedule or perimeter indicator, with no human intervention.

### 2. Vitamin Selection and Automatic Mixing

- Different vitamin will be used in order to improve broiler health. System can be used to auto mix and deliver to the broiler nipple.
- More accurate and no human intervention.



# Chili Project Analysis

- 1 acre = 4,000 polybags
- 1 polybags = 2,000 gram
- 1 seasons = 8,000 kg
- 1 kg = RM7.00 (ex-farm)
- 1 year = 2 seasons
- REVENUE = RM112,000/ year

\*By using Smart Farming, estimated 20% increase in term of yield production @ **RM22,400 / year**



## Functionalities



### Remote Monitoring of Farm parameters

Sensors send data back to the cloud.  
Allow monitoring via mobile app.



### Automation of Control Systems

Realtime data, determine farm's condition.  
Activate control systems based on parameters set



### Remote Control

Grower can manually manipulate the control systems via the mobile app.

## Key Benefits



### Increasing yield

Efficient & Precise application. Healthier.  
Less damaged crops.



### Reducing labor costs

Less labour required per acre



### Reducing material costs

Less water, fertilizer and pesticide usage

## Features



**Developed in-house** - mix of open source & proprietary software and hardware.  
Easier for improvement and upgrade.



### Flexible & customizable

Can be integrated with almost any piece of electrical farm equipment and sensors.

Follow us on:



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# Thank You

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