

# Boosting crop production with IoT



*MIMOS Smart Control Panel can help improve agricultural yield by tracking and managing plants' health and needs in a greenhouse, nursery or even open field.*

**By Philip Chan**

For the next decade, the outlook for the agriculture sector appears promising despite global challenges such as climate change, growing population and scarcity of resources. Investment in innovation and technology is certainly vital for this sector as there is a positive correlation between an increase in agricultural productivity and economic growth.

According to the Department of Statistics Malaysia, the Gross Domestic Product (GDP) from the agriculture sector in Malaysia increased to RM 24,527 million in the second quarter of 2020 from RM 22,503 million in the first quarter of 2020.





Against such backdrop, research on precision agriculture has been carried out by scientists and agronomists in a controlled environment such as laboratories or greenhouses to prove their studies and analysis. With that, there is a significant demand for smart greenhouse with state-of-the-art technology, which has become a part of Industrial Revolution 4.0 (IR 4.0) in Malaysia.

Understanding this, MIMOS has developed Smart Control Panel (SCP), an Internet of Things (IoT)-based smart farming system that can help boost agricultural yield and productivity.

The SCP is a control and measuring system that tracks and manages plants' health and needs in a greenhouse, nursery or even open field. It can be easily installed and integrated into an existing or new greenhouse.

Besides offering a cost-effective monitoring and feedback system for agriculture and aquaculture applications, SCP enables users and farmers to have better control of key parameter inputs aimed at improving their current operational practices.



It is designed to meet the demand of a fully automated greenhouse for researchers or commercial use regardless of sizes and locations. The integration of wireless technology in smart greenhouse becomes beneficial when cost and maintenance are the main concern among greenhouse operators.

SCP features an intuitive menu-driven touch screen that allows users to easily program, remote control, as well as

adjust the settings and sensors monitoring. This can turn a greenhouse into a smart IoT self-regulating greenhouse that is equipped with the micro-climate-controlled environment for optimal plant growth.

## How does the technology work?

The SCP has a real-time sensor reading pane that measures ambient and soil conditions. The software also features a real-time sensor trending plot on the start-up screen.

Currently, it supports a four-parameter graph plot-ambient temperature, ambient humidity, light intensity and carbon dioxide sensor.

Its automated threshold adjustment and scheduling facilitate four greenhouse parameters to be controlled according to sensor readings. These include misting control which is based on ambient humidity sensor; thermal screen which is based on light intensity sensor while circulation fan and ventilation fan through ambient temperature sensor.

The SCP comes with a 10.1" Touch Screen Display with USB interface for data retrieval and an easy interface to greenhouse AC distribution box.

In terms of technology benefits, SCP enables automated environment where the key variables in determining crops success such as temperature, humidity, light and oil moisture are continuously monitored. The automated actions evaluate change and take corrective action, thus maintaining optimal conditions for plant growth.





Another advantage is SCP allows remote monitoring where the system is integrated into mobile application, allowing users to manage and monitor the sensors and devices through a dashboard which can be viewed via a mobile phone.

In aquaculture perspective, real-time monitoring of water quality will ensure that customer or user will be able to react immediately if there is a change in the water quality that will affect the fish breeding or livelihood.

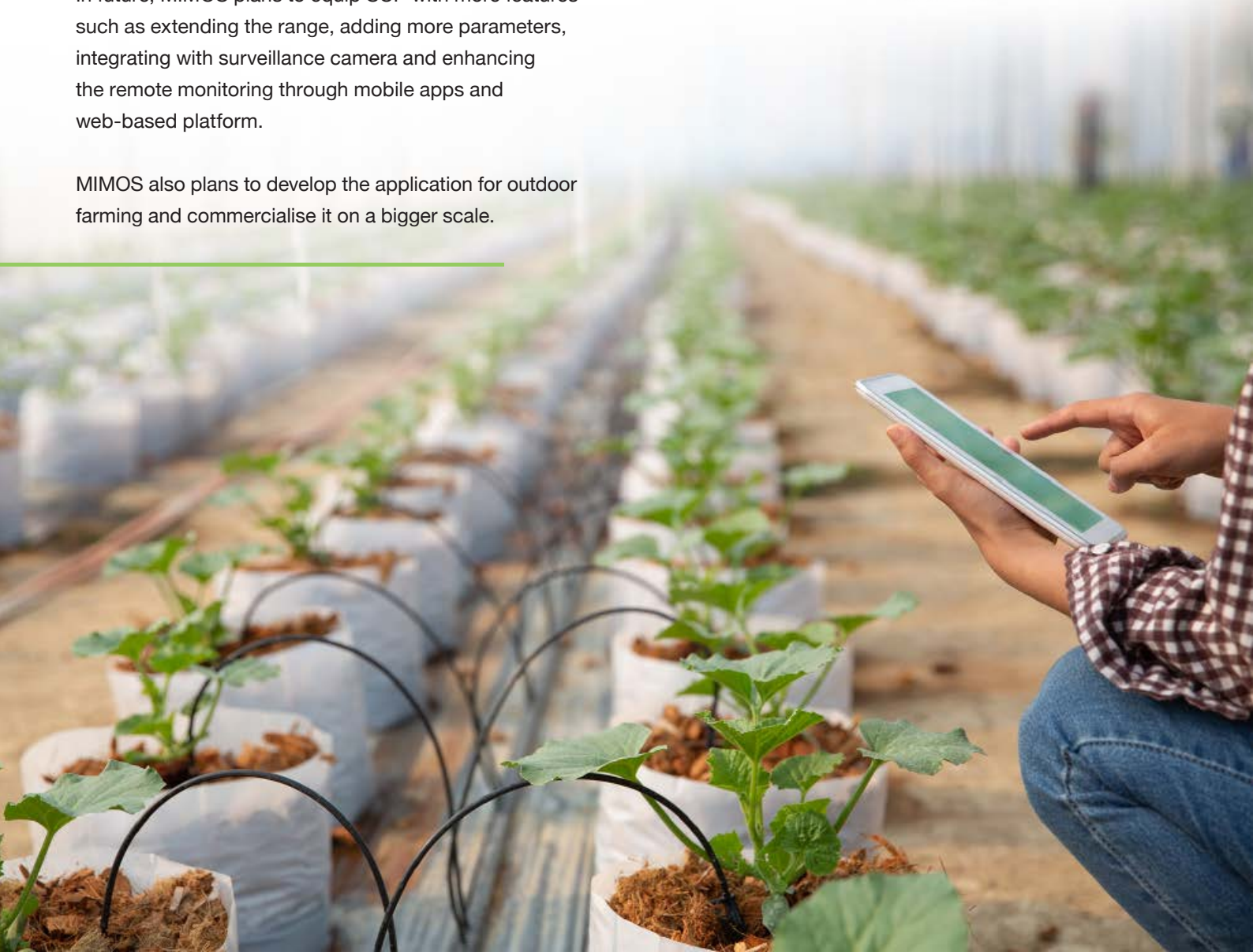
## Commercialisation and future plans

This IoT agriculture solution has been deployed for shiitake mushroom cultivation in Kundasang, Sabah over a 12-month period from September 2016 to June 2017. Since the deployment of the system, it showed tremendous improvement in terms of the quality and quantity of the mushroom harvested in two batches.

The yield has increased to 192.6 percent and the quality of the mushrooms have significantly improved in terms of average thickness and weight per mushroom.

In future, MIMOS plans to equip SCP with more features such as extending the range, adding more parameters, integrating with surveillance camera and enhancing the remote monitoring through mobile apps and web-based platform.

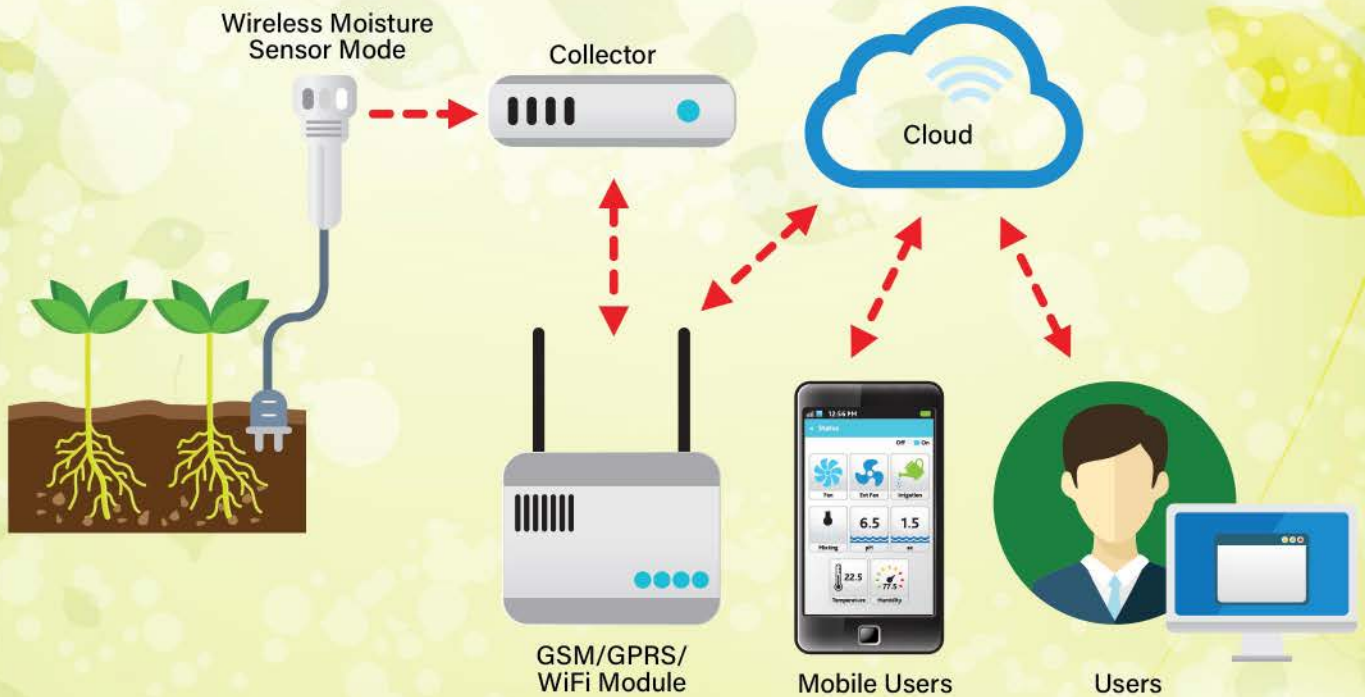
MIMOS also plans to develop the application for outdoor farming and commercialise it on a bigger scale.



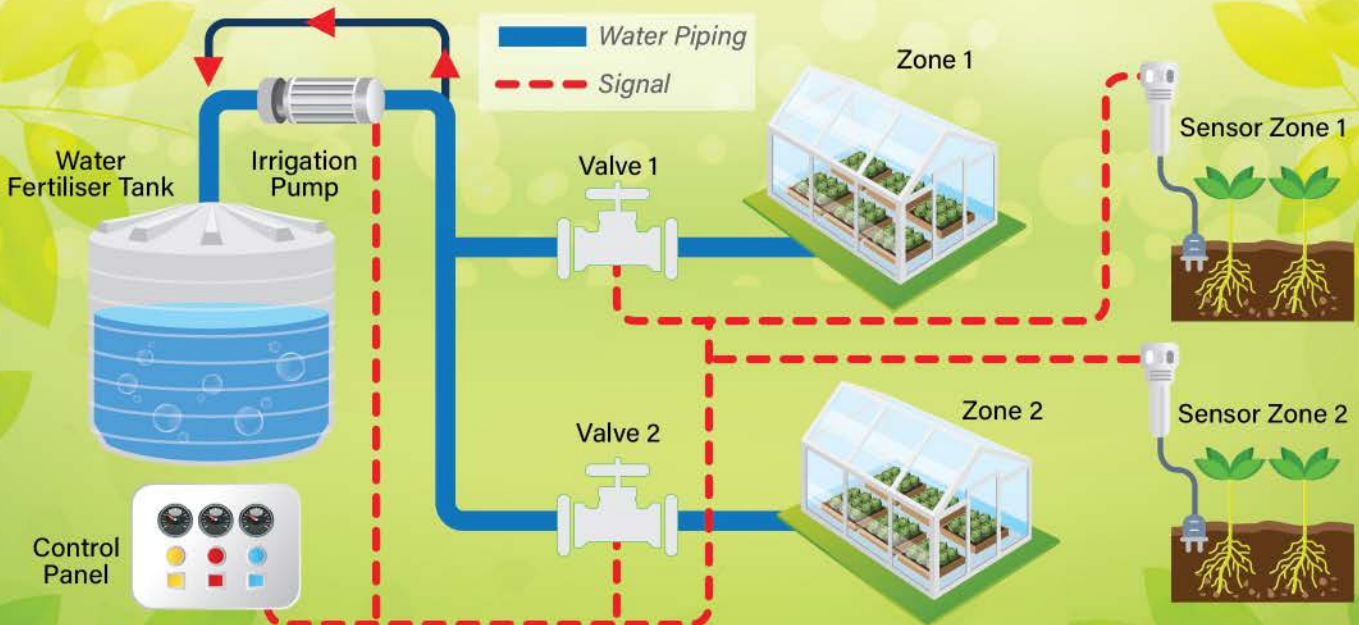


# System Overview

## System Architecture (Sensor Data):



## System Architecture (Control Devices):



➤ For more information on IoT in agriculture, please contact MIMOS Berhad at +603 – 8995 5000 or email to [info@mimos.my](mailto:info@mimos.my).