



MECHANIZATION & AUTOMATION IN AGRICULTURE AND FOOD INDUSTRY

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MINISTRY OF AGRICULTURE
AND FOOD SECURITY

MARDI is a statutory body for almost 53 years which has been mandated to conduct research in agriculture, food, and agro-based industries

AGROFOOD MODERNISATION

(MECHANIZATION & IR4.0)



PADDY



FRUITS



VEGETABLES



INDUSTRIAL CROPS

TECHNOLOGY MODERNISATION ON PADDY PRODUCTION

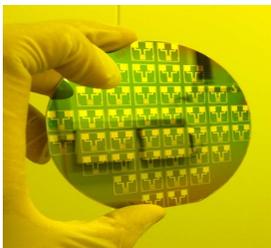


SMART AGRICULTURE TECHNOLOGY IN PADDY

Water Level Sensor

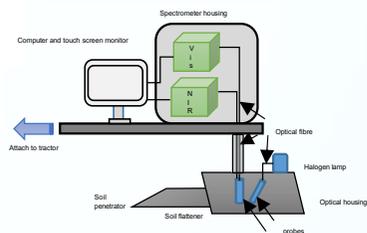


Electrochemical Sensor



Water Management

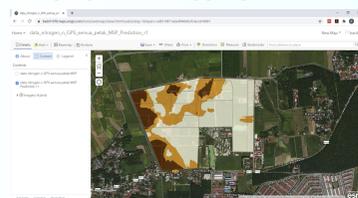
Soil Sensor



Land Leveling System



Soil properties mapping



Land Preparation

VRT Seeding



Seeds Preparation

Baja N-Bio Booster



DRON- Mapping & Spraying

Crops Maintenance



VRT Fertilizer & SSNM

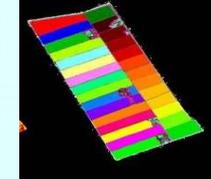


EWS

Yield Monitoring Sensor



Yield prediction



Harvesting



SOP PHL

IR4.0 APPLICATION ON PADDY PRODUCTION

1

LAND PREPARATION

- Land leveling index
- Soil strength
- Seeds preparation



2

WATER MANAGEMENT

- Water in and out
- Water quality
- Water level



3

NUTRIENT MANAGEMENT

- Fertilizer application



4

CROP MONITORING

- Pest and Disease
- Climate change



5

HARVESTING AND POST HARVEST HANDLING

- Yield monitoring
- Post harvest loss



6

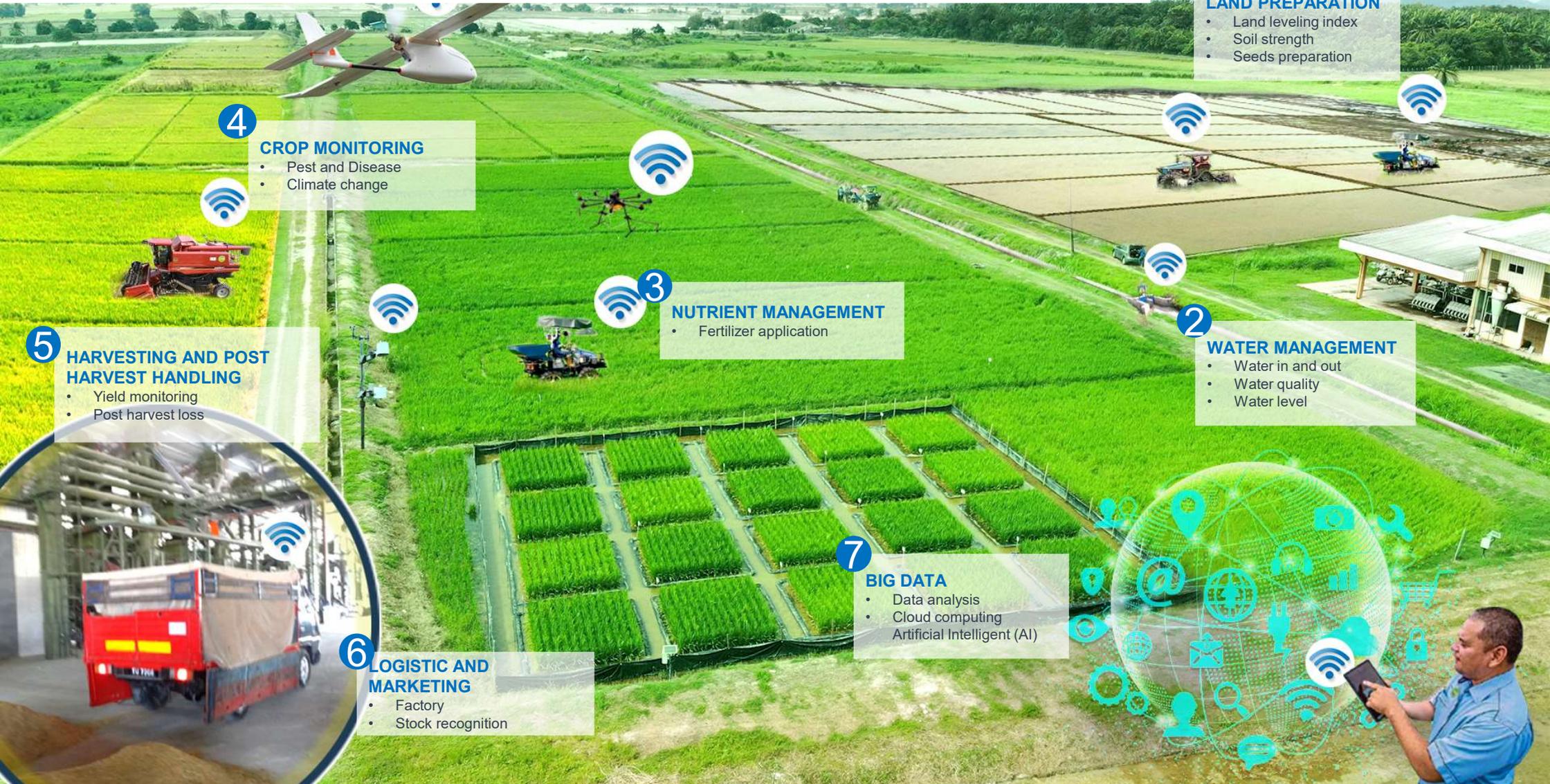
LOGISTIC AND MARKETING

- Factory
- Stock recognition

7

BIG DATA

- Data analysis
- Cloud computing
- Artificial Intelligent (AI)



BENEFITS AND IMPLICATIONS

BENEFITS AND IMPLICATIONS



Even crops growth

15-25% fertilizer reduction



50% labor reduction



TECHNOLOGY IMPACTS

Farmers

Paddy production cost reduction

Industrial

Increase efficiency

MARDI

Leading in Technology of precision farming and as a reference body

Country

Increase capital income

TECHNOLOGY MODERNISATION ON FRUITS PRODUCTION



FARM MECHANIZATION PACKAGE ON PINEAPPLE PRODUCTION IN **MINERAL SOIL**



Land preparation



Planting



Fertilizer Application



Chemical liquid application

Irrigation



Land preparation



Harvesting



Pruning



FARM MECHANIZATION PACKAGE ON PINEAPPLE PRODUCTION IN **PEAT SOIL**



4 half track tractor- rubber typed



Planting aid implement



Spraying motorcycle for small scale farm

Chemical spraying for large scale farm



Harvesting aid



Waste management



TECHNOLOGY MODERNISATION ON VEGETABLES PRODUCTION



FARM MECHANIZATION PACKAGE FOR LOW LAND CABBAGE PRODUCTION



Land preparation



Organic manure application



Seeds preparation



Plastic mulching

Planting



Crops maintenance



Drone



Boom sprayer

Harvesting

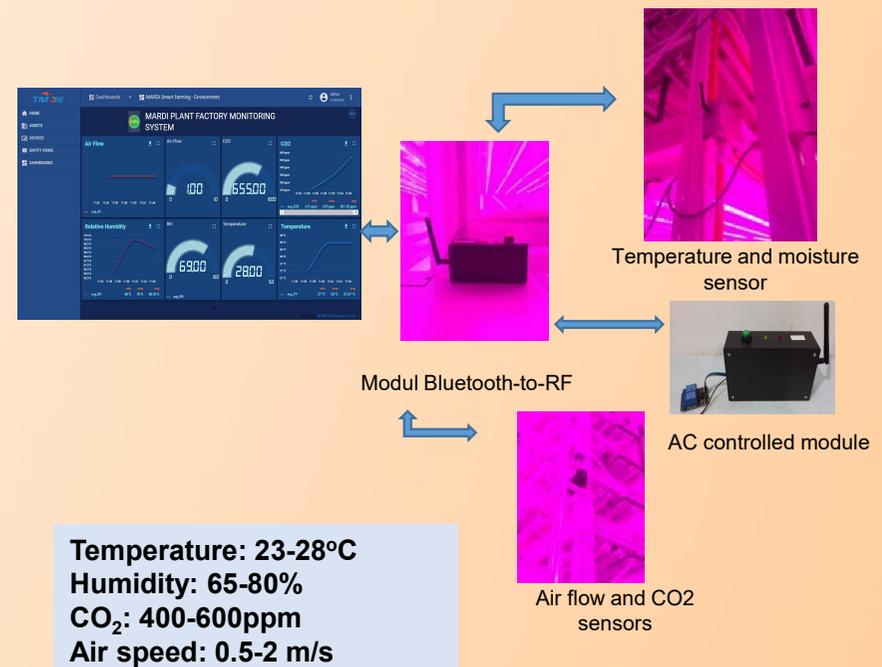


IOT TECHNOLOGY IN PLANT FACTORY



- Controlled environment structure.
- Uses irrigation system.
- Fertilizer application using automation or IoT application, LED lighting, air conditioner and tier hydroponic rack.
- Increase vegetable production
- Solving chemical left on crops, water and soil pollution and also increase food security
- 5-10 times yield compare to conventional method
- Environmental friendly

Environment monitoring system using IoT



PRODUCTIVE and ECONOMIC CROPS



Romaine



Green coral



Red coral

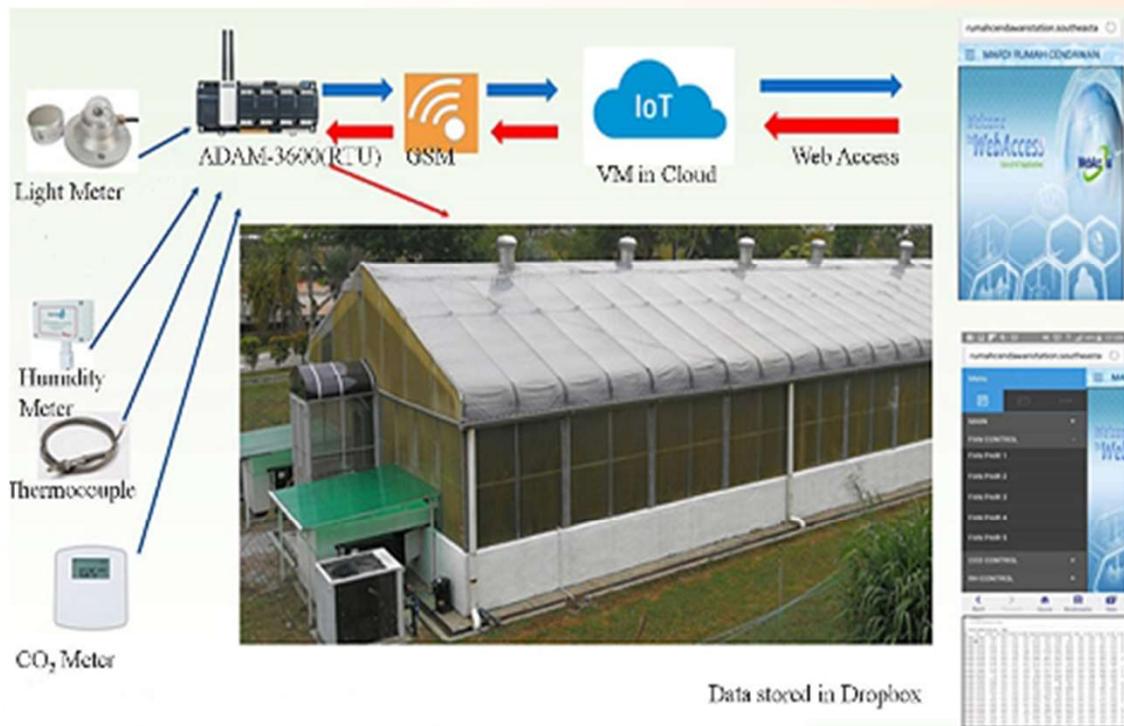


Butterhead



Kailan

CONTROLLED ENVIRONMENT SYSTEM FOR MUSHROOM PRODUCTION



- Controlled environment smart micro through Internet of Things (IoT) for parameters monitoring like temperature, lighting, and humidity
- High value mushroom crops
- *Tiram putih, kelabu, telinga kera & tiram raja*

Varieti cendawan di tanam di dalam rumah pengeluaran cendawan



Cendawan Tiram Putih



Cendawan Tiram Kelabu



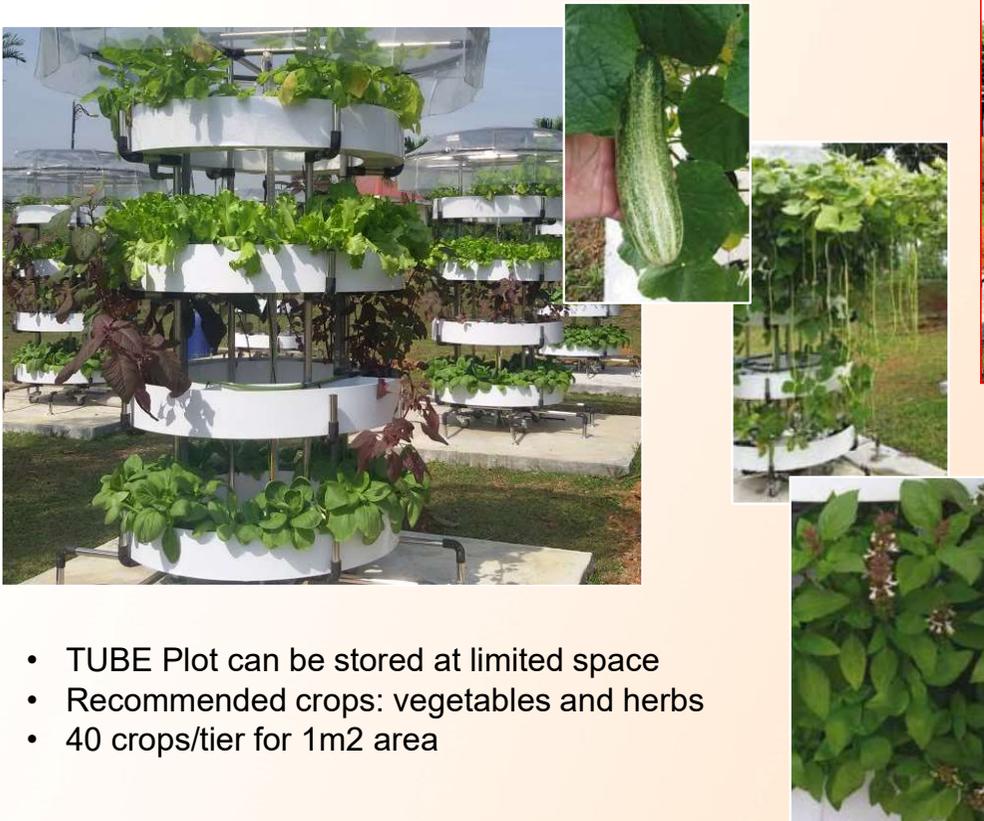
Cendawan Tiram Raja



Cendawan Telinga Kera

VERTICAL FARMING STRUCTURE

Tropical Urban Environment Plot – TubePlot



- TUBE Plot can be stored at limited space
- Recommended crops: vegetables and herbs
- 40 crops/tier for 1m² area

TECHNOLOGY MODERNISATION ON INDUSTRIAL CROPS PRODUCTION



FARM MECHANIZATION PACKAGE ON SWEET POTATO PRODUCTION



Bed forming machine



Organic manure spreader



Transplanter



Boom sprayer

Weeding machine



Harvester



Harvesting and leaf cutting machine



Slashing machine



CONCLUSION

- **Agro-food engineering technology and innovations that have been and will be generated by MARDI are able to increase production efficiency, improve product quality, adapt to climate change and guarantee the sustainability of the country's agro-food sector.**
- **It can further strengthen the country's food security.**



THANK YOU