MECHANIZATION & AUTOMATION IN AGRICULTURE AND FOOD INDUSTRY

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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 Management

Soil Sensor

Land Leveling System

VRT Seeding

Seeds Preparation

Crops Maintenance

VRT Fertilizer & SSNM

Baja N-Bio Booster

Yield Monitoring Sensor

Harvesting

Soil properties mapping

Water Level Sensor

Electrochemical Sensor

Soil

Penetrator

Optical housing

Computer and touch screen monitor

Optical fibre

Spectrometer housing

Land Preparation

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

- Even crops growth
- 15-25% fertilizer reduction
- 50% labor reduction
- Paddy production cost reduction
- Increase efficiency
- Leading in Technology of precision farming and as a reference body
- 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
- Harvesting

- Drone
- Boom sprayer
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

Temperature and moisture sensor
Modul Bluetooth-to-RF
AC controlled module
Air flow and CO2 sensors

Temperature: 23-28°C
Humidity: 65-80%
CO₂: 400-600ppm
Air speed: 0.5-2 m/s
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*
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.