# ENVIRONMENTAL SUSTAINABILITY Report 2022

Universiti Teknologi MARA Sarawak

UNIVERSITI TEKNOLOGI MARA

**Published By**

Perpustakaan Tun Abdul Razak
Universiti Teknologi MARA Cawangan Sarawak
Jalan Meranek, 94300 Kota Samarahan
Sarawak

**Published Date**

31 October 2023

**Chief Editor**

Ts. Dr. Nurzawani Md Sofwan

**eISBN: 978-967-0828-66-4**

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Design and Visual Development by Ts Madeleine Elna Perreau

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# ENVIRONMENTAL REVIEW & CONTINUAL IMPROVEMENT

Continuous improvement is a continuous endeavor to improve the operation of the organisation. The top management and members of the projects will review the performance of each environmental programme. The management's and committee's recommendations on each of the environmental programmes/projects will reflect the organisation's progress towards a more environmentally sustainable management.

## Research on Internet of Things (IoT)

The research for AASAS and AFS are still ongoing to date. The most important part of AASAS that needs to be further investigated is the soil NPK sensor as there is not much documentation out there to prove the reliability of the data produced. As for the rest of the sensors onboard, the IoT steering committee has already found the most optimal way of operating those devices which will contribute to a better sensor readout. On the other hand, the AFS requires more intensive reliability tests for the power inverter and solar charge controller in various weather conditions in order to help design more accurate operating procedures for the automated fertigation routine. Both systems are expected to get re-deployed fully in the 3rd quarter of the year 2022.

### Soil nutrient sensors calibration (Soil NPK)

- Ongoing Prototype Development (AASAS V2) (Figure 6.1)
- Ongoing Prototype Development (AFS V2) (Figure 6.2)
- Soil nutrient sensors calibration (Soil NPK)

### Current Milestones:

- Automated Affordable Smart Agriculture System (AASAS) prototype development
- Early data collection – NFT/DFT hydroponic irrigation tank
- Power supply issue – solar panel was not able to maintain optimal battery charge level due to unpredictable weather (inconsistent solar charging routine)
- The solution to the power supply issue: increase the number of panels per device from one to two

***Figure 6.1*** *Soil NPK Sensor Calibration Process For AASAS*

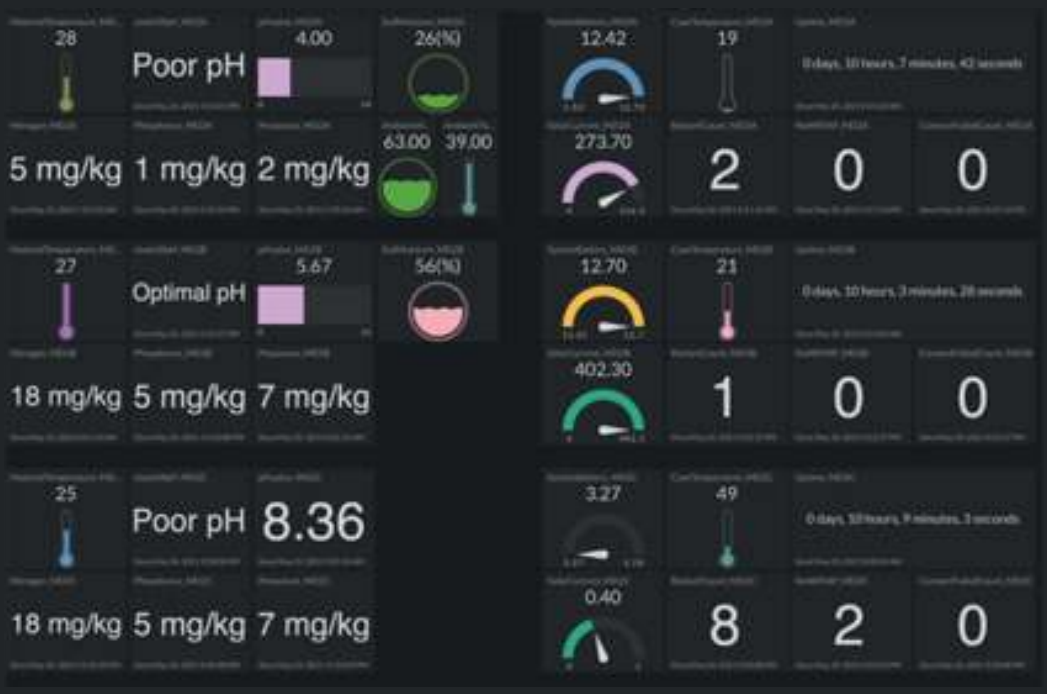


***Figure 6.2*** AASAS Dashboard Viewed From Initial State Platform

Based on the well recognised NASA's Technology Readiness Level (TRL), the current state of the prototype is at scale number 6 which is Technology Demonstration. This state of TRL is roughly estimated through the assessment of technical readiness and output data reliability by the IoT steering committee. The TRL is expected to increase by the end of June 2022 after the completion of sensors calibration.

- **Frequency of Monitoring (Annually, Bi-annually, Quarterly)**

  *Every month during Majlis Pengurusan Eksekutif (MPE) throughout 2019-2021*

- **Monitoring Group, Either Internal or External**

  *Majlis Pengurusan Eksekutif (MPE) UiTM Cawangan Sarawak (Internal) and NPRDC committee (Internal)*

- **List of Relevant Parameters (Water, Land, Air, Waste)**

  *Solar energy monitoring/Soil nutrient monitoring/Crop health monitoring*

- **Solar Energy Monitoring/ Soil Nutrient Monitoring/ Crop Health Monitoring**

  *UiTM Sarawak Branch to become the Center of Excellence for smart farming by 2025*

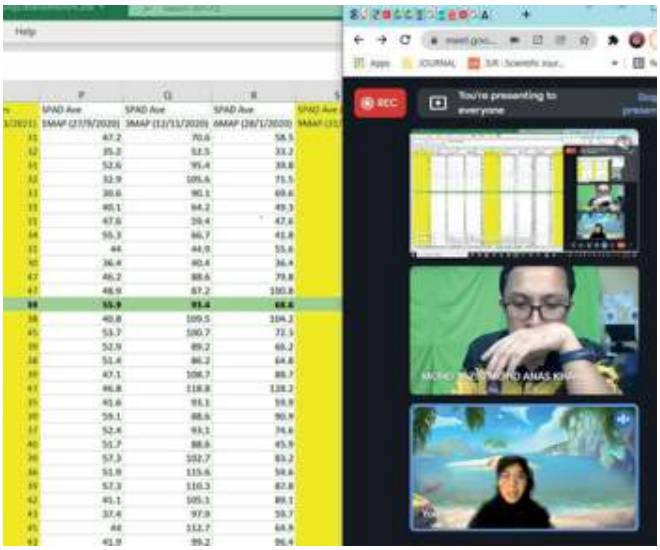

***Figure 6.3*** *NPRDC Progress Meeting*

# Editorial Board Members

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e ISBN 978-967-0828-66-4

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