AI-Driven Smart Horticulture for Climate Sensitive Plant using Soil Analysis and Image Processing: A Tropical Perspective
Project Review Meeting at Multimedia University (MMU) and Research Visits to the Smart Agriculture Plot at MMU Cyberjaya and TaniNoka Farm at UPM Serdang
Report/Minutes Form

I. Organizer:

Name:	Dr. Lee It Ee
Position:	Project Leader
Institution:	Multimedia University

II. Program:

Date: 3-4 June 2025

Venue:

(1) Project Review Meeting and Sharing Session at Multimedia University (MMU)
(2) Site Visit to the Smart Agriculture Plot at MMU Cyberjaya and Field Study Visit to TaniNoka Farm at UPM Serdang

Program Agenda:

Project Members will arrive at Cyberjaya on 2 June 2025 (Monday).

Day 1: 3 June 2025 (Tuesday)
Project Review Meeting and Sharing Session at MMU

08:30am	Arrival of IVO Project Team at MMU
09:00am	Welcome remarks by the Dean of Faculty of Artificial Intelligence & Engineering (FAIE)
09:15am	Sharing session on integrating automation and smart solutions for enhanced monitoring and productivities in sustainable agriculture from Centre for Smart System and Automation (CSSA)
10:30am	Coffee break and networking
11:00am	Sharing session and campus tour hosted by International Collaborations & Engagement (ICE)
12:30pm	Lunch break
13:30pm	Project review meeting
15:30pm	Coffee break
16:00pm	Sharing session on innovations and safe technology transfer that promote eco-friendly commercialisation practices while enhancing yield and quality in sustainable smart farming from Centre for Law and Technology (CLT)
17:30pm	End of Day 1

Day 2: 4 June 2025 (Wednesday)
Site Visit to the Smart Agriculture Plot at MMU Cyberjaya and Field Study Visit to TaniNoka Farm at UPM Serdang

08:30am	Site visit and sharing session on the system deployment at the sustainable smart agriculture plot in MMU Cyberjaya campus
10:00am	Coffee break
10:30am	Field study visit to TaniNoka Farm at Universiti Pertanian Malaysia (UPM), Serdang
11:00am	Farm tour and sharing session on current practices on sustainable and regenerative agriculture cultivation
13:00pm	Return to MMU Cyberjaya Campus
13:30pm	Lunch break
14:30pm	Project workplan review
16:00pm	Coffee break
16:30pm	Project workplan review and next steps
17:30pm	End of Program

The ASEAN IVO Academic Event held on 3–4 June 2025 at Multimedia University (MMU), Cyberjaya, and TaniNoka Farm, UPM Serdang, served as a pivotal platform for reviewing collaborative progress, sharing interdisciplinary insights, and planning future milestones in the project *"AI-driven smart horticulture for climate sensitive plant using soil analysis and image processing: a tropical perspective"*.

On Day 1 (3 June 2025), the program began with the arrival of project members and a welcome address by the Dean of the Faculty of Artificial Intelligence & Engineering (FAIE), setting the tone for a day of technical exchange and strategic review. The first sharing session was led by Dr. Cham Chin Leei, Chairperson of the Centre for Smart System and Automation (CSSA), who presented on the integration of automation and smart technologies in sustainable agriculture. This session emphasized the deployment of real-time monitoring systems and adaptive control mechanisms within greenhouse environments, aligning with one of the project's key deliverables relevant to the development of IoT-enabled smart farm monitoring system and AI-driven data analytics solution. Following a networking coffee break, the International Collaborations & Engagement (ICE) office hosted a campus walking tour and shared MMU's global engagement initiatives.

The afternoon was dedicated to the Project Review Meeting, where each institution presented updates on their assigned tasks. MMU reported the successful installation of a 4 kW photovoltaic system, with plans to upgrade to 6 kW, and shared progress on published and upcoming papers. UTB, NIA, and NUOL discussed their contributions to both greenhouse development and AI-driven farm monitoring systems. Notably, NIA and NUOL showcased their camera-based image detection system for crop anomaly identification, while UTB confirmed task completion pending publication. The day concluded with a session by Dr. Olivia Tan Swee Leng from the Centre for Law and

Technology (CLT), who addressed legal and ethical considerations in technology transfer and eco-friendly commercialization practices.

Day 2 (4 June 2025) transitioned to field-based learning, beginning with a site visit to MMU's smart agriculture plot, where participants observed system deployments and discussed their practical implications. This was followed by a visit to TaniNoka Farm at UPM Serdang, whereby Mr. Ooi hosted the participants and shared insights into regenerative agriculture and sustainable cultivation practices. These visits reinforced the real-world relevance of the project's research components and provided valuable feedback for refinement.

The afternoon sessions focused on reviewing and updating the project workplan, including budget allocations and upcoming travel plans. The team confirmed a remaining budget of USD 70,000, with USD 46,000 allocated for research materials, USD 18,000 for travel, and USD 6,000 for conference participation. MMU will utilize USD 28,000, UTB USD 6,000, and NIA USD 12,000 (shared with NUOL) for infrastructure development. Travel funds will support upcoming project visits to Brunei (13-16 July 2025) and Cambodia (13-16 October 2025), hosted by UTB and NUOL respectively.

The event concluded with a strategic alignment session, ensuring all partners were clear on their roles, deliverables, and next steps. The collaborative spirit and shared commitment to innovation and sustainability were evident throughout the program, laying a strong foundation for the next phase of the ASEAN IVO project.

III. Participants:

No.	Name	Organization
1	Dr. Lee It Ee (Event Host)	MMU, Malaysia
2	Dr. Cham Chin Leei	MMU, Malaysia
3	Dr. Ngu Eng Eng	MMU, Malaysia
4	Dr. Chung Gwo Chin	MMU, Malaysia
5	Dr. Lim Tiong Hoo	UTB, Brunei
6	Dr. Nurun Najeebah Az-Zahra binti Pg Dato Seri Setia Haji Mohammad Tashim	UTB, Brunei
7	Dr. Phon Sovatna	NIA, Cambodia
8	Mr. Long Touch	NIA, Cambodia
9	Dr. Khanthanou Luangxaysana	NUOL, Laos
10	Dr. Phutsavanh Thongphanh	NUOL, Laos
11	Dr. Olivia Tan Swee Leng	MMU, Malaysia
12	Dr. Qamar Wali	MMU, Malaysia
13	Dr. Muhammad Sheraz	MMU, Malaysia
14	Mr. Nahin Ar Rabbani	MMU, Malaysia
15	Ms. Ikram Benfarhat	MMU, Malaysia

IV. Summary of the activities corresponding to the objectives.

Objectives:

1. **To assess the progress, challenges, and future direction of the ASEAN IVO collaborative research project**
   The Project Review Meeting at MMU serves as a critical checkpoint for project members to present updates on their respective contributions, evaluate progress against the established KPIs, and identify key challenges/drawbacks that may hinder the physical progress of the project. This session aims to strengthen project governance, improve coordination among project members, and ensure that all collaborative efforts are effectively aligned with the overall research objectives and timeline. It also sets the stage for refining strategies and enhancing the impact of deliverables in the coming phases.

2. **To facilitate interdisciplinary knowledge sharing on cutting-edge smart agriculture solutions**
   The sharing sessions led by MMU's Centre for Smart System and Automation (CSSA) and Centre for Law and Technology (CLT) aim to promote a cross-disciplinary dialogue on sustainable agriculture. These sessions will explore the integration of automation, AI, and legal-technological frameworks in modern farming practices, with a special focus on high-value crops like vanilla. By bringing together expertise from engineering, law, and agriculture, the event encourages holistic thinking, supports innovation, and inspires the co-creation of scalable, sustainable farming models tailored to tropical environments.

3. **To enrich research understanding through immersive field exposure and practical engagement**
   The site visit to MMU Cyberjaya's smart agriculture plot and TaniNoka Farm at Universiti Putra Malaysia (UPM) offers participants direct exposure to real-world applications of smart farming systems. These hands-on visits are designed to deepen participants' understanding of how theoretical concepts are translated into functional, context-specific solutions. Interacting with field experts and observing ongoing practices will enable researchers to gather practical insights, validate research assumptions, and explore potential areas for further collaboration, pilot testing, or technology refinement.

4. **To review and finalize project workplan**
   Outline and finalize the project's workplan, including the allocation of roles, responsibilities, and milestones, ensuring all team members have a clear understanding of their tasks.

Highlights of Key Activities:

The ASEAN IVO Academic Event was a strategically curated two-day program that brought together researchers and institutional partners from across the ASEAN region to evaluate project progress, share interdisciplinary insights, and plan the next phase of collaborative research in AI-driven smart horticulture. The event featured a blend of formal reviews, technical knowledge exchange, and immersive

field experiences, all designed to strengthen the project's impact and regional relevance. The key activities of the Academic Event are highlighted as follows:

1. **Project Review Meeting**
   The event's core activity was the Project Review Meeting, which served as a critical checkpoint for assessing the progress of each institution's contributions. Representatives from MMU, UTB, NIA, and NUOL, presented updates on their assigned deliverables under two main components:

   Category A: Smart Greenhouse Development
   MMU reported the successful installation of a 4 kW photovoltaic-battery system, with plans to construct an extended 6 kW system for the 3,000 sqft vanilla smart farm deployment. UTB shared progress on the water wall and reverse fan technologies for adaptive temperature control, while NIA and NUOL contributed to the integration of renewable energy systems. The team discussed the need to accelerate publication efforts to disseminate findings.

   Category B: IoT and AI-Driven Monitoring
   NIA and NUOL demonstrated a camera-based system for crop anomaly detection using computer vision. UTB confirmed the completion of its IoT sensor network, though related publications are still in progress. The review emphasized the importance of aligning technical outputs with the project's KPIs and ensuring timely dissemination.

2. **Technical Sharing Sessions**
   Two high-impact technical sessions were conducted to foster interdisciplinary learning and innovation:

   Centre for Smart System and Automation (CSSA)
   Delivered by Dr. Cham Chin Leei, Chairperson of CSSA, this session explored the integration of automation, sensor networks, and AI in smart agriculture. Dr. Cham highlighted the role of adaptive environmental control systems in optimizing crop growth in tropical climates, directly supporting the greenhouse development objectives of the project.

   Centre for Law and Technology (CLT)
   Presented by Dr. Olivia Tan Swee Leng, Chairperson of CLT, this session addressed the legal, ethical, and regulatory dimensions of smart farming technologies. Dr. Olivia emphasized the importance of safe technology transfer, intellectual property considerations, and eco-friendly commercialization practices, which are critical for ensuring the long-term sustainability and scalability of project outcomes.

3. **Campus Tour and Networking**
   Hosted by the International Collaborations & Engagement (ICE) office, the campus tour showcased MMU's research infrastructure and international partnerships. This session fostered informal networking and opened avenues for future collaboration and joint initiatives.

4. **Field Visits and Practical Demonstrations**

The second day of the event was dedicated to immersive, hands-on learning through two key site visits that bridged theoretical research with real-world application.

MMU Smart Agriculture Plot

Participants visited the smart agriculture plot at MMU Cyberjaya, where they observed live demonstrations of integrated smart farming systems. A highlight of this visit was the showcase led by Project Leader Dr. Lee It Ee, who presented the 4 kW photovoltaic-battery system developed and installed by MMU. This renewable energy system supports a self-sustaining smart greenhouse and features an adaptive environmental control mechanism powered by solar energy. Dr. Lee explained the system's technical configuration, battery management module, and plans to upgrade it to 6 kW.

In addition, Dr. Lee announced the upcoming deployment of three greenhouses at the MMU site, which will serve as demonstration platforms for showcasing IoT-assisted monitoring solutions in smart farming. These greenhouses will be equipped with sensor networks and automated control systems tailored to the unique growth requirements of targeted crops, including hydroponic-based lettuce and vanilla. The initiative aims to validate the integration of real-time data acquisition, AI-driven analytics, and responsive environmental control in tropical agricultural settings.

TaniNoka Farm at UPM Serdang

The visit continued at TaniNoka Farm, where participants engaged in a guided tour and sharing session focused on regenerative agriculture practices. Experts at the farm discussed sustainable cultivation methods, soil health management, and the integration of traditional farming knowledge with modern technologies. This visit reinforced the importance of field validation and community-based innovation in achieving scalable and sustainable agricultural solutions.

5. **Project Workplan Review and Strategic Planning**

The final sessions focused on refining the project's roadmap and aligning future activities, whereby the discussions centered on the following:

- Clarifying the roles and responsibilities of the project teams for the next phase;
- Confirming the objectives, proposal planning and logistics arrangements for upcoming site visits to Brunei (13–16 July 2025) and Cambodia (13–16 October 2025); and
- Strategizing publication and dissemination efforts.

A key highlight of this session was the reallocation of the remaining project budget in details. (Details are omitted here.)

This strategic planning session ensured that all partners were aligned on expectations, equipped with resources, and prepared to move forward with clarity and purpose.

V. Others.

Sharing session on integrating automation and smart solutions for enhanced monitoring and productivities in sustainable agriculture from Centre for Smart System and Automation (CSSA)


Sharing session and campus tour hosted by International Collaborations & Engagement (ICE)




Sharing session on innovations and safe technology transfer that promote eco-friendly commercialisation practices while enhancing yield and quality in sustainable smart farming from Centre for Law and Technology (CLT)

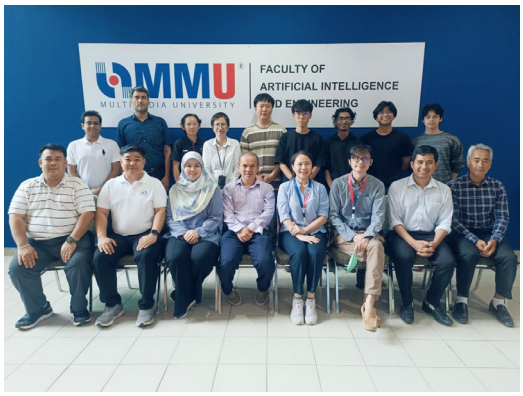
Site visit and sharing session on the system deployment at the sustainable smart agriculture plot in MMU Cyberjaya campus

Farm tour and sharing session on current practices on sustainable and regenerative agriculture cultivation at TaniNoka Farm, Serdang





Project workplan review

End of Report