

MASCAR '25

MATRICULATION STEM CARNIVAL

"STEM PEMACU TRANSFORMASI MINDA MADANI"



KMK

IOT Challenge



KEMENTERIAN PENDIDIKAN
BAHAGIAN MATRIKULASI



AZRI

AKMAL

ADAM

GENERASI
MADANI

ASEAN
MALAYSIA 2025

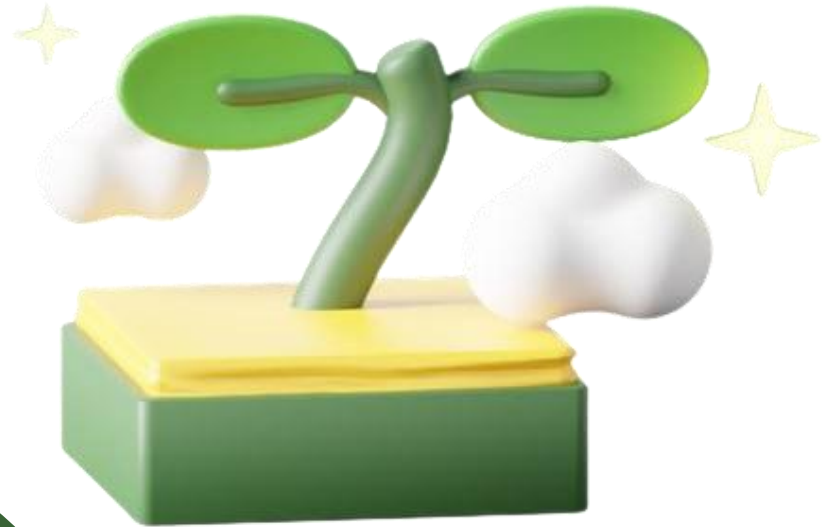
MALAYSIA
MADANI

Malaysia
Truly Asia

25
MILYARAN TAHUN
KEBERSEKUTUAN
MUDA MELAKSANAKAN

PANATECH SOLUTIONS

REDUCE
REACT
RE-GREEN



GREENHOUSE EFFECT



ABOUT 90%

Life on Earth depends on energy coming from the Sun. About half the light energy reaching Earth's atmosphere passes through the air and clouds to the surface, where it is absorbed and radiated in the form of infrared heat. About 90% of this heat is then absorbed by greenhouse gases and re-radiated.

<https://science.nasa.gov/climate-change/causes>

MALAYSIA

You're not just imagining it: Malaysia really is hotter by day (and night)



A file photograph shows people sheltering under umbrellas in Kuala Lumpur. — Bernama pic

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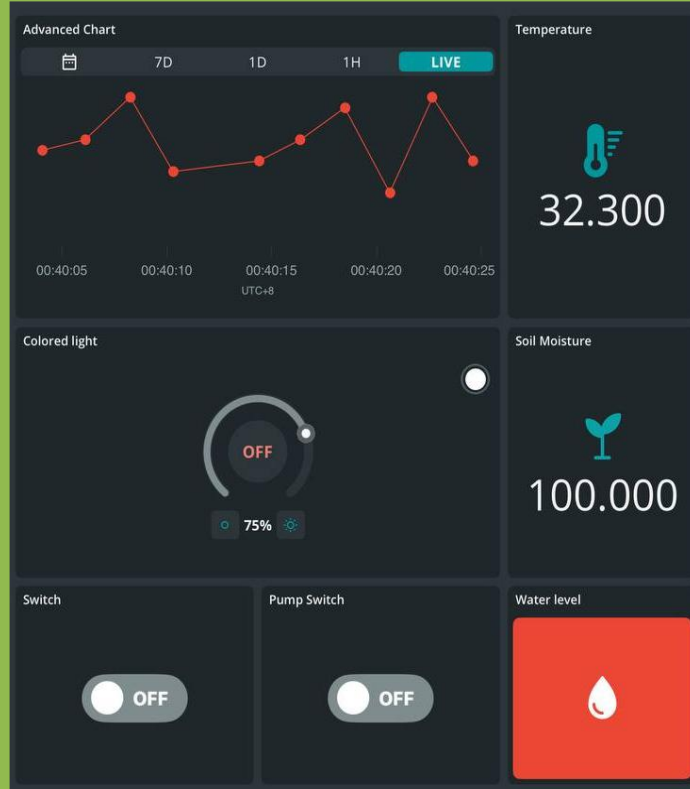
By R. Loheswar

Sunday, 21 Jul 2024 7:00 AM MYT

KUALA LUMPUR, July 21 — The end of the now-annual heatwave was supposed to bring relief to Malaysians, but the promised cooler temperatures have not come.

SMART SERA

Smart Sera is a smart farming system that automates irrigation based on real-time environmental data. By reducing water waste and limiting harmful gas emissions from overwatering, it helps prevent the greenhouse effect and supports efforts to reduce global warming.



SMART SERA APP

The user can do direct monitoring using their devices through the installed app

ADVANTAGES

- Automated & data-driven watering :
Activates only when soil is dry, preventing overwatering. You can organize your ideas clearly
- Prevents harmful gas emissions : Minimizes nitrous oxide release from excessive watering and fertilizer loss
- Remote monitoring : Can be tracked and adjusted through IoT platforms.

DISADVANTAGES

- Internet Dependency : Always requiring stable internet connections.
- Data Accuracy : Data output may not always be accurate or reliable over time due to the basic sensors.



COMPARISON TO TRADITIONAL SYSTEM

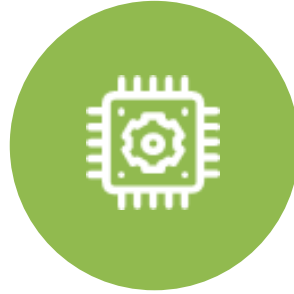
- Fixed or manual watering : Waters plants regardless of actual soil condition.
 - High water wastage : Uses more water than necessary.
 - Inconsistent plant health : Plants may be overwatered or underwatered.
- 
- 

FUTURE IMPROVEMENTS



Solar-powered operation

Integrate solar panels to make the system energy-independent and more eco-friendly.



Raspberry Pi

With the Raspberry Pi's higher computing power, the system could support features like camera-based plant health monitoring



AI Irrigation Forecast

Use weather forecasts and plant growth data to decide watering schedules more accurately.

DOCUMENTATION

📖 README



Smart Serra: Smart Farming IoT System

Smart Serra is an IoT-based smart agriculture system that automates irrigation and monitors environmental conditions in real-time. Designed for sustainability, this system helps reduce water waste and harmful emissions caused by traditional greenhouse practices — contributing to the fight against global warming.



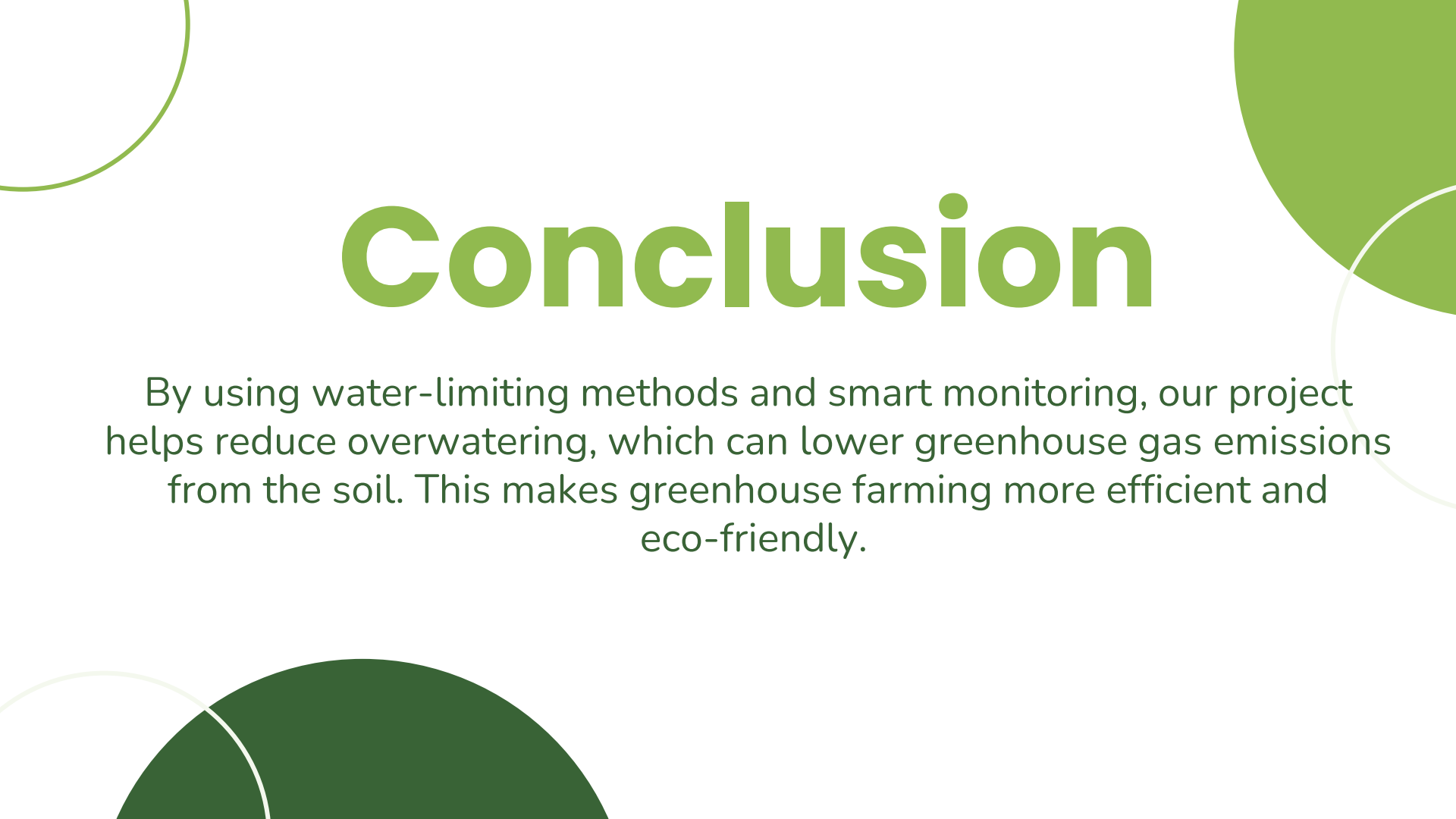
Features

- 🌡️ Monitors temperature and humidity
- 🌱 Detects soil moisture levels
- 💧 Monitors water availability
- 🚰 Automatically controls water pump
- 🛠️ Servo motor control for valve or feeder
- 🌈 RGB LED indicators based on system state
- 📺 Real-time LCD status display
- ☁️ Integrated with Arduino IoT Cloud for remote monitoring and control
- 📱 Push notifications when water is low



The image features a white background with three green circular elements: a thin outline in the top-left corner, a solid dark green circle in the bottom-left corner, and a solid light green circle in the bottom-right corner.

**DEMO
TIME !**



Conclusion

By using water-limiting methods and smart monitoring, our project helps reduce overwatering, which can lower greenhouse gas emissions from the soil. This makes greenhouse farming more efficient and eco-friendly.