

# Advanced Sensor Technology for Enhanced Environmental and Health Monitoring in Tropical Dairy Farms

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• **Funding Requested:** 2 Million Baht

• **Duration:** Nov 1, 2024 – Oct 31, 2026



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# INTRODUCTION

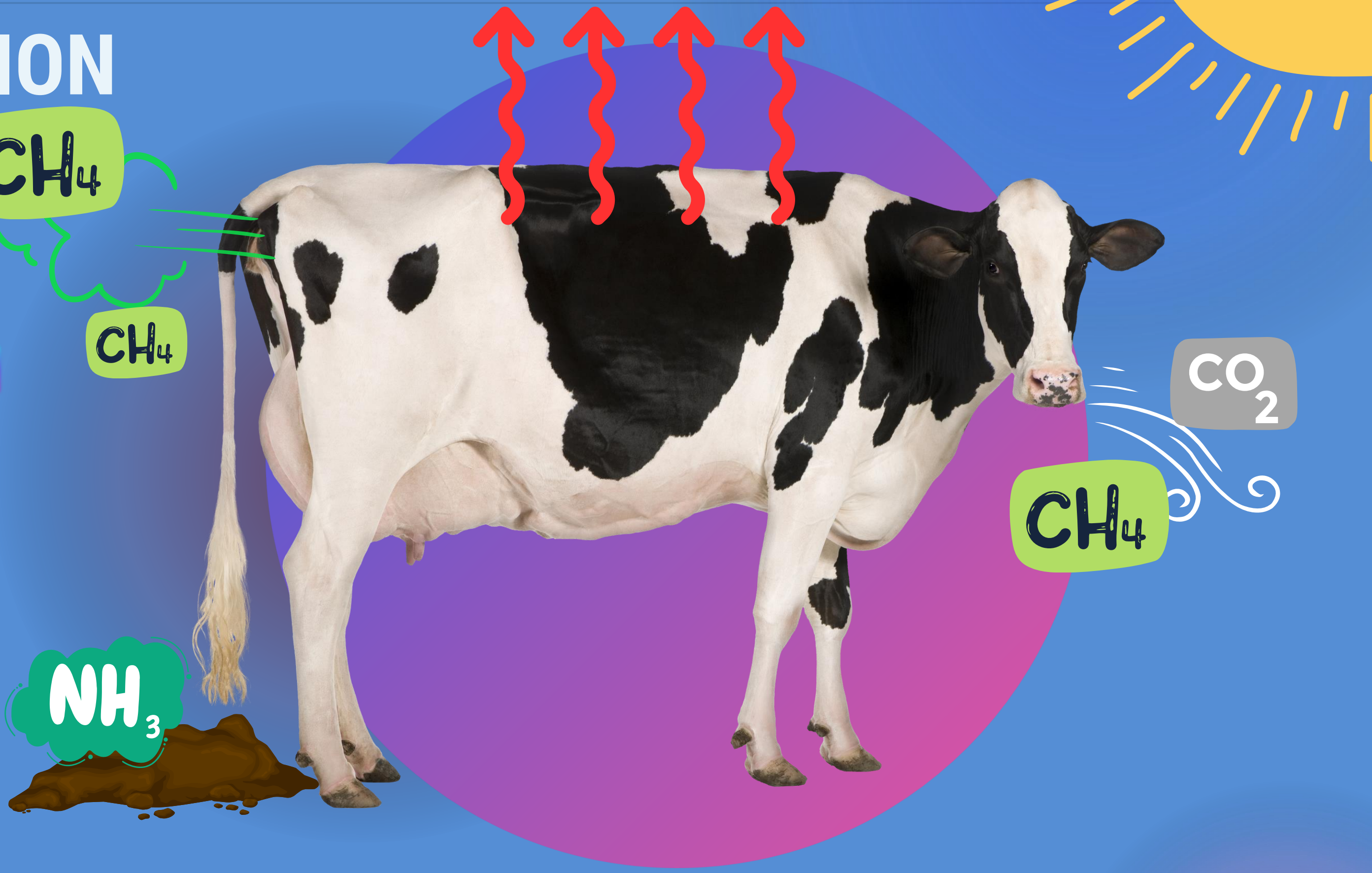
Heat stress



INCREASE  
GREENHOUSE  
GAS EMISSION



Gas measurement  
&  
monitoring system



# BACKGROUND

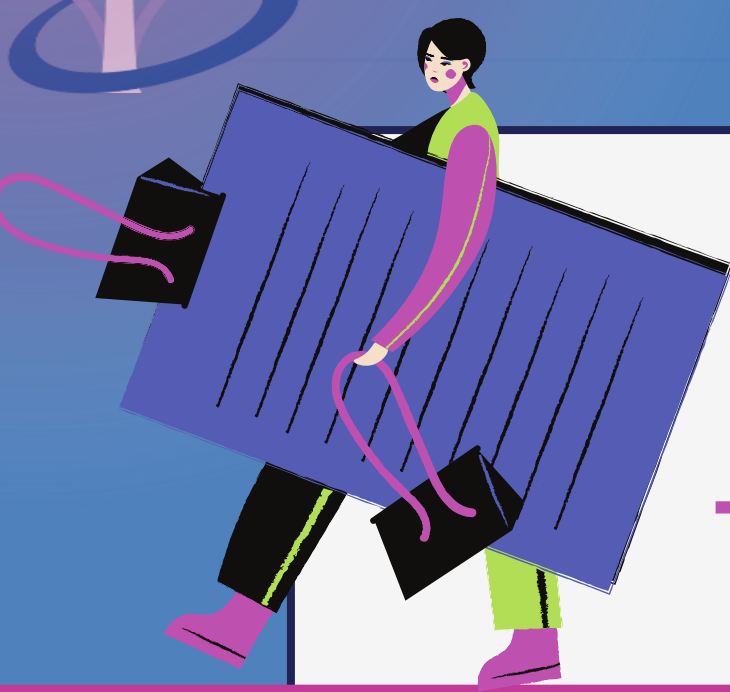
## CHALLENGES

Gas emissions and climate change, along with the implications of a carbon footprint tax, pose significant challenges to sustainable dairy farm management, affecting animal health, animal welfare, and farm productivity

## AIM

To deploy innovative sensor technology for real-time monitoring of cow health and environmental parameters





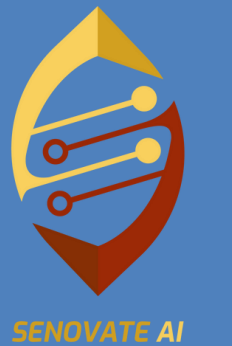
# TARGETS

- **Develop and integrate a sensor-based system** for monitoring **cow health** (movement activity sensor) and **environmental factors** (temperature and humidity).
- **Implement gas sensors** to measure emissions such as carbon dioxide, methane and ammonia.
- Analyze data to **develop real-time warning algorithms** for farmers.
- **Assess** environmental impact and **develop** mitigation strategies.



# METHODOLOGY

- **Sensor Development:** Collaborate with technology companies (Senovate AI Co. Ltd.) to customize sensors for tropical environments.
- **Data Collection:** Deploy sensors on a pilot farm, continuously collecting data on animal health and environmental parameters.
- **Data Analysis:** Use machine learning to process and analyze data, developing real-time warning systems.
- **Impact Assessment:** Evaluate the effectiveness of sensor technology and develop predictive models for better farm management.



## Technology Developed from 2018 to 2024

### Smart Innovation Technology

#### Smart D-Lert IoT Platform

Military Grade Sensors  
 AI notification for Cows breeding  
 Farmer & Rider Mobile & Web Application  
 Cow's sensor installation



### Digital Skills Lifelong Learning Smart Society Smart communities

Precision farming  
 Bio-surveillance  
 Bio-security  
 Training on-site & Online



### Infrastructure Renovation

Animal Hospital  
 Diagnostic Center  
 Smart classroom  
 Demonstration Farm  
 Waste Management System



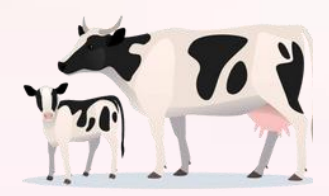
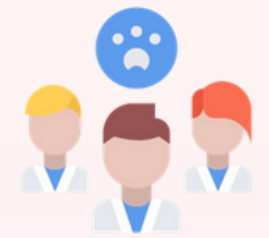
### Smart Mobile Clinic Smart Hospital

Production monitor  
 Disease alert  
 Smart mobile service  
 Routine health check

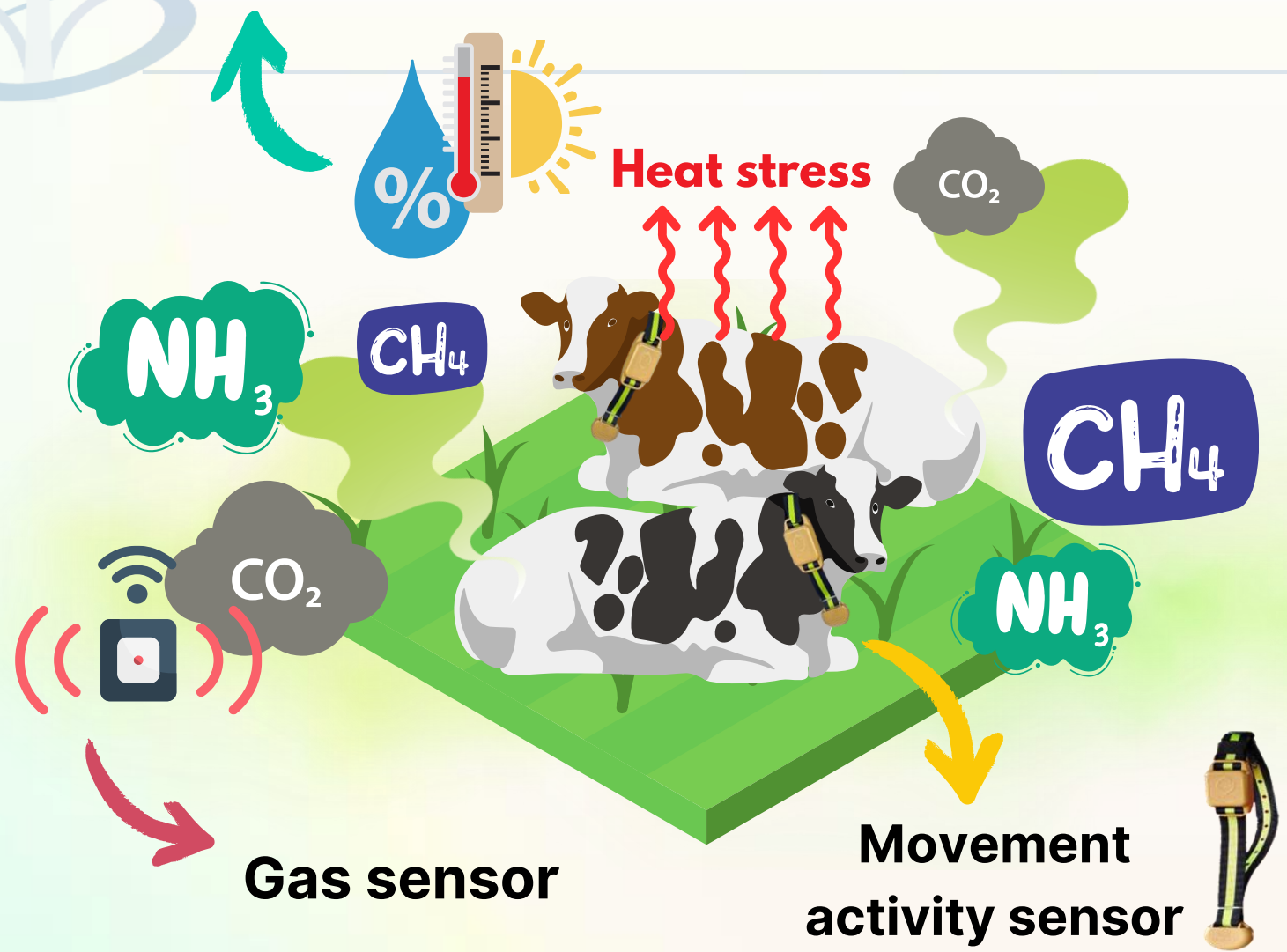


### Expansion

Dairy cow smart technology  
 Smart farming communities



Environmental factors (temperature & humidity)



Sensor-based system

Cloud-based storage & Artificial intelligence



**Real-time warning system**  
Discover the health status & environmental effects of dairy cow

EMISSION



Immediate action !!!

Improve cow welfare

Reduce environmental footprint

Enhance farm productivity & sustainability

# EXPECTED IMPACT & OUTCOMES



## IMPACT

- 1** Enhance farm management with real-time alerts to **improve cow welfare.**
- 2** **Reduce environmental footprint** through better management strategies.
- 3** **Contribution to knowledge** in tropical agriculture technology and sustainable practices.

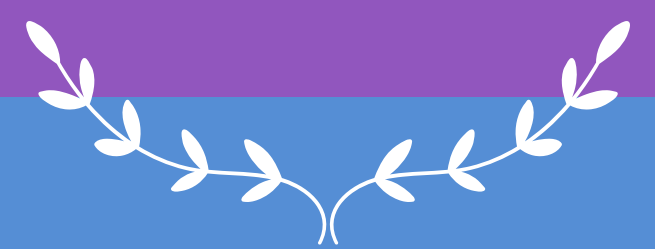


## OUTCOMES

- 1** **Real-time warning system** for immediate action to reduce cow stress.
- 2** **Insights into health status and environmental impact** of dairy cattle in tropical climates.
- 3** **Targeted mitigation strategies** based on accurate real-time data.
- 4** Enhanced **farm productivity and sustainability.**

# STRATEGIC ALIGNMENT WITH KEY UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

By integrating cutting-edge sensor technology, we are setting a new standard in monitoring and improving animal health, enhancing environmental sustainability, and promoting responsible production practices, all of which are critical to achieving global objectives for a sustainable future.







## MULTIDISCIPLINARY COOPERATION & INTERNATIONAL NETWORKS

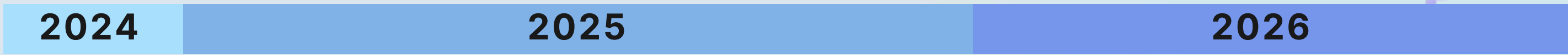
### Multidisciplinary Cooperation

- Contribution to university's research output and reputation in sustainable agriculture.
- Collaboration across veterinary science, computer science, and environmental science.
- Engagement with the community

### International Networks

- Partnerships with Wageningen University.
- International conferences and high-quality international publications
- Networking for future research opportunities.

# PROJECT ACTIVITIES TIMELINE

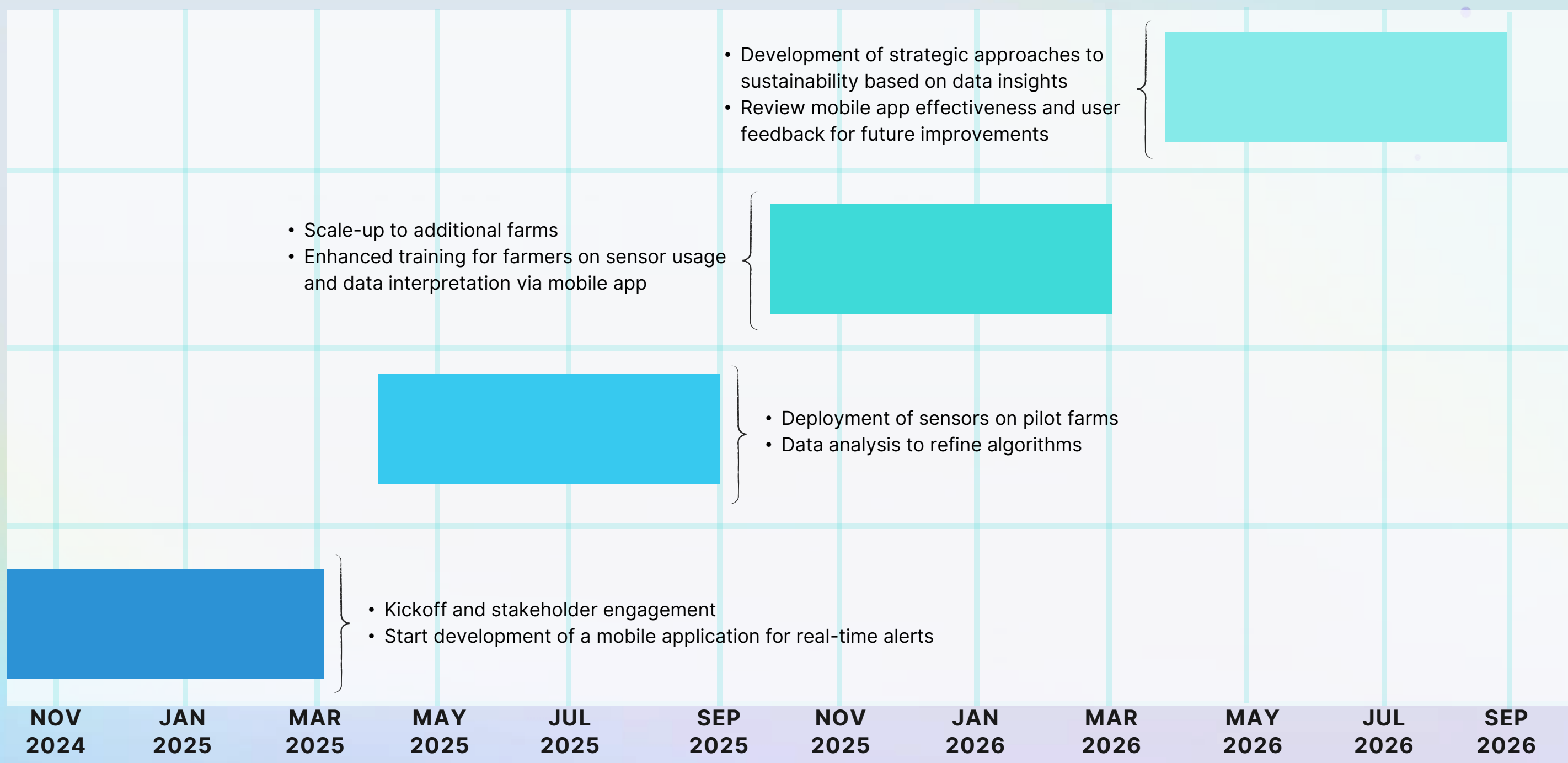


**Expansion Phase**  
(Q3 - Q4)

**Optimization Phase**  
(Q1 - Q2)

**Implementation Phase**  
(Q3 - Q4)

**Development Phase**  
(Q1 - Q2)



# Conclusion



## 1 Project Impact

marks a significant advancement in **the application of advanced sensor technology in tropical dairy farming**



## 2 Focus Area

Real-time Monitoring: Tracking **cow welfare, comfort, and stress levels.**

Environmental Impact: Evaluating the effects on **the environment in tropical dairy farming.**



## 3 Innovative Outcome

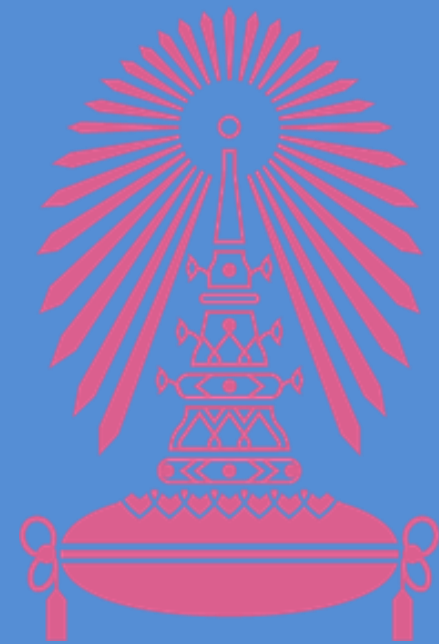
The development of **a proactive warning system** will allow farmers to make timely management changes, enhancing sustainability.



## 4 Global Relevance

This project aligns with worldwide initiatives **to promote sustainable agriculture, fostering both productivity and environmental stewardship.**

**Thank you for your attention**



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