

# Carbon farming in Thanh Hoa

## Proactive Carbon Monitoring with AI and Digital Twins

Funding granted: AUD 480,658

### Context

Vietnam's agricultural sector is under immense pressure due to a rapidly growing population and the severe impacts of climate change. These challenges include unpredictable weather patterns, reduced soil fertility, and increased greenhouse gas emissions. Additionally, in many places, the current agricultural practices are still inefficient and unsustainable, exacerbating environmental degradation. The lack of advanced technological integration, inadequate data for decision-making, and high costs of manual data management can further hinder the progress.

### Solution

This project addresses these challenges by introducing an AI-powered digital twin platform that integrates IoT, AI, real-time Big Data analytics, and Earth observation technologies for proactive carbon farming management in Thanh Hoa Province. This innovative solution creates a virtual model that mirrors the physical farming environment, allowing for precise monitoring and management of agricultural practices.

By providing real-time data on soil carbon levels and other critical parameters, the platform enables farmers and policymakers to optimize carbon farming practices, enhance carbon storage, and minimize greenhouse gas emissions. This approach aims to improve overall farm productivity and sustainability while creating new income opportunities through providing calculation and verification tools for carbon credits.

The platform is expected to be a stepping stone for optimizing agricultural practices, enhancing carbon storage, and creating new income opportunities through AI-verified carbon credits, aligning with Vietnam's goals for sustainable agriculture and carbon market development by 2028.



### Key activities

- 1. Develop Digital Twin Framework:** Integrate various data sources and conducting simulations to create a comprehensive digital twin platform that mirrors the physical farming environment, facilitating efficient monitoring and management of agricultural practices.
- 2. Implement AI-based Algorithms:** Deploy advanced AI algorithms to automate data collection for continuous monitoring of soil carbon and essential metrics, enabling precise carbon calculations, predictive analyses, and optimized recommendations for effective carbon farming and reduced emissions.
- 3. Carbon Farming & Training:** Establish a comprehensive system for carbon quantification and verification, coupled with extensive training on equipment and the digital twin system. Continuous feedback from users ensures iterative improvements, equipping stakeholders to effectively utilise the technology.

### For further information

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