Revolutionising Crop Residue Burning Mitigation with Satellite-Powered Insights

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GISTDA | University of Glasgow School of Computing Science

Scan for more detail
dulapahv.dev/internship.pdf

ABOUT GISTDA

GISTDA (Geo-Informatics and Space Technology Development Agency) is a Thai space agency and space research organisation that specialises in remote sensing and technology development satellites.

GISTDA offers services such as optical satellites, radar satellites, measurement devices, unmanned aerial vehicles (UAVs), and information & analytics.

THINGS I DID

Plan
Design Three-Tier Architecture
Presentation, Application, DB

GUI Design
Planned and designed in Figma

Data Preparation
From GISTDA open-data to PostgreSQL database

Frontend Development
React.js, Tailwind CSS, and more

API Creation
Node.js, tested with Insomnia

Deployment
Deployed on GISTDA server with a reverse proxy

TECHNOLOGIES USED

Programming Languages
HTML CSS JS SQL

Frontend Development
mapbox MapLibre AXIOS

API Development
node.js

Backend Development and Database Management

Design and Internationalisation

Geospatial Analysis and Data Visualisation
TURF

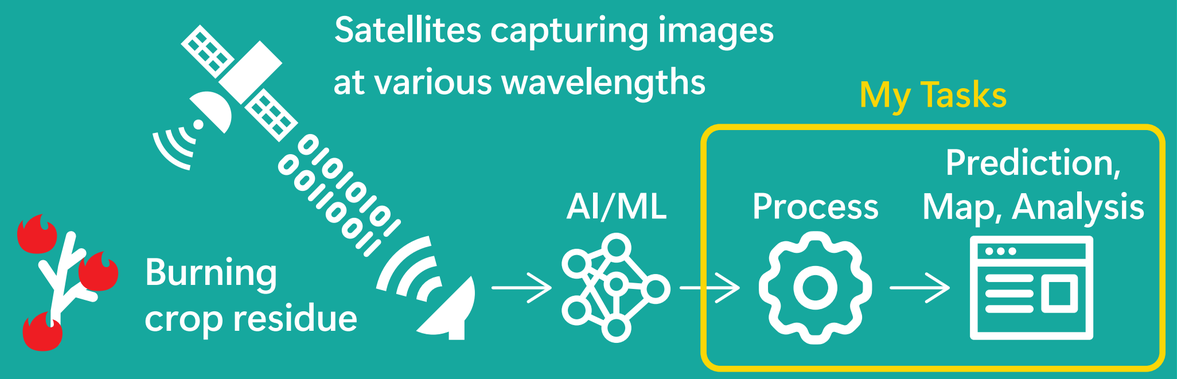
Operating System

Repository and Version Control

DEVELOPMENT OVERVIEW

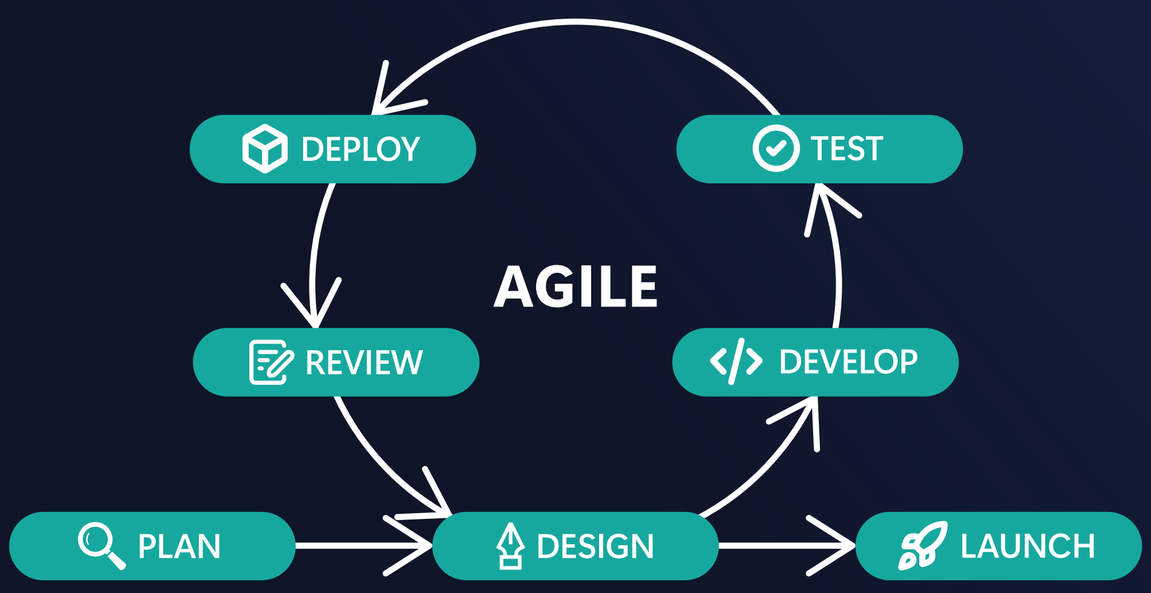
Background, Proposed Solution, and My Contribution

- Farmers in Thailand commonly burn crop residue after harvest instead of proper plowing, in order to save costs and time. This practice leads to problems such as wildfires and air pollution.
- Satellites with advanced imaging capabilities, such as infrared and multispectral imaging, help identify crop types, ages, and burning spots.
- This data enables the government to predict and prevent fires, making informed decisions for authorities and vulnerable communities.



How I Process Data to Make Prediction and Analysis

Development Methodology



Agile is a flexible and iterative approach to software development. Instead of planning out every detail upfront, it breaks projects into smaller parts, known as "iterations" or "sprints."

Advantages of Agile:

- Flexibility: Allows for changes and improvements throughout the project.
- Customer-Centric: Focuses on customer needs and feedback.
- Faster Delivery: Releases small, usable parts of the product quickly.
- Improved Quality: Continuous testing and reviews enhance product quality.
- Cost-Efficiency: Minimises risks and reduces unexpected expenses.
- Better Communication: Encourages team collaboration and transparency.
- Higher Satisfaction: Clients and stakeholders see results sooner, boosting satisfaction.

ACHIEVEMENTS AND REFLECTIONS

Self Validation

This internship offers valuable insights into software developer positions and various other roles within the company.

From University Knowledge to Real-World Usage

I extensively applied my university knowledge of SQL, networking, UNIX, Python, and three-tier architecture to this internship.

New Techniques and Good Practices

My internship supervisor taught me new techniques and good practices for writing optimised and maintainable code.

Expanded Connections

I met many talented colleagues and experienced developers. We built connections and exchanged contact information and LinkedIn profiles.

Figure 1: Overview Page

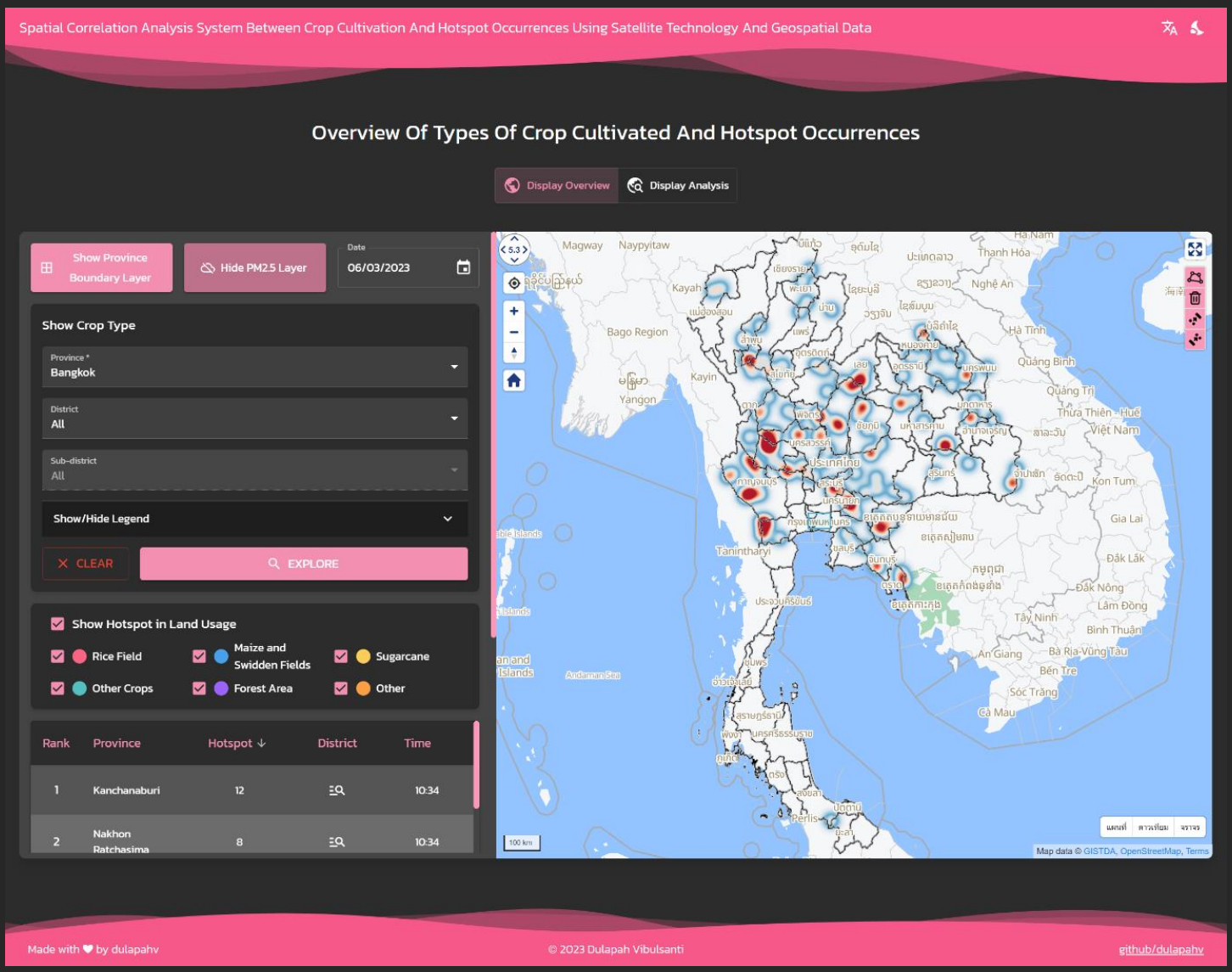


Figure 2: Analysis Page

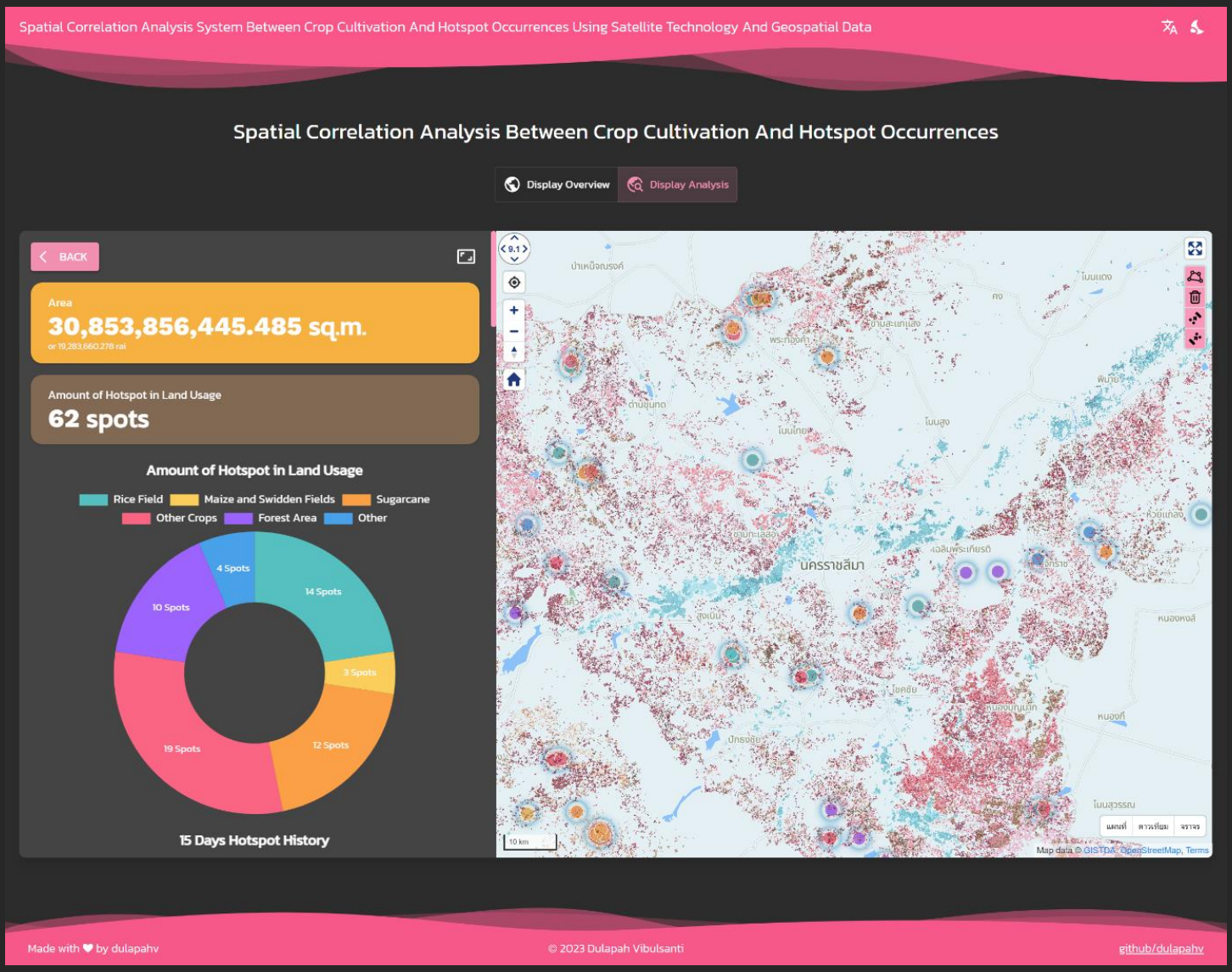


Figure 3: Expanded Analysis Page (Dark Mode)

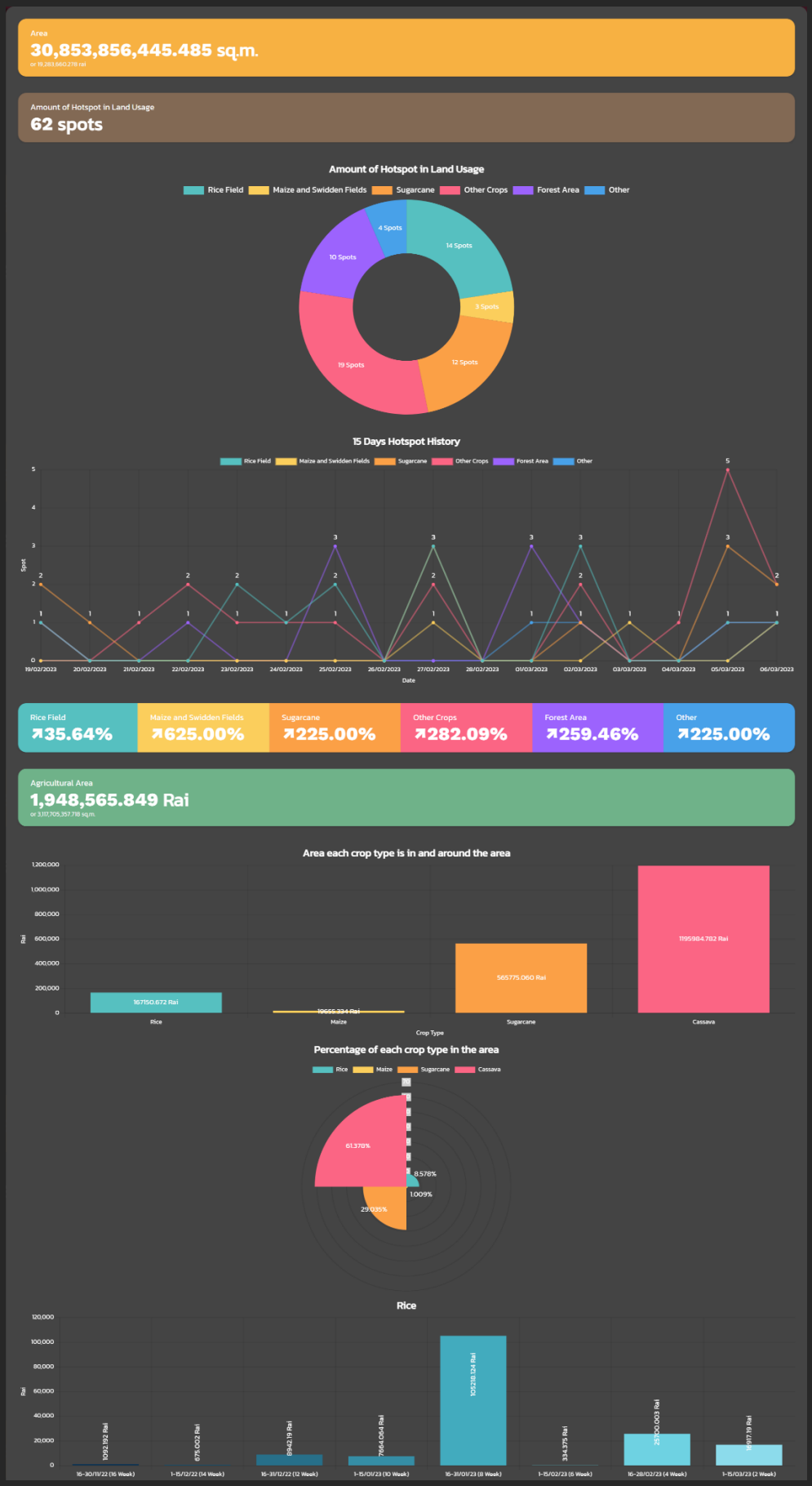


Figure 4: Expanded Analysis Page – Continue (Dark Mode)

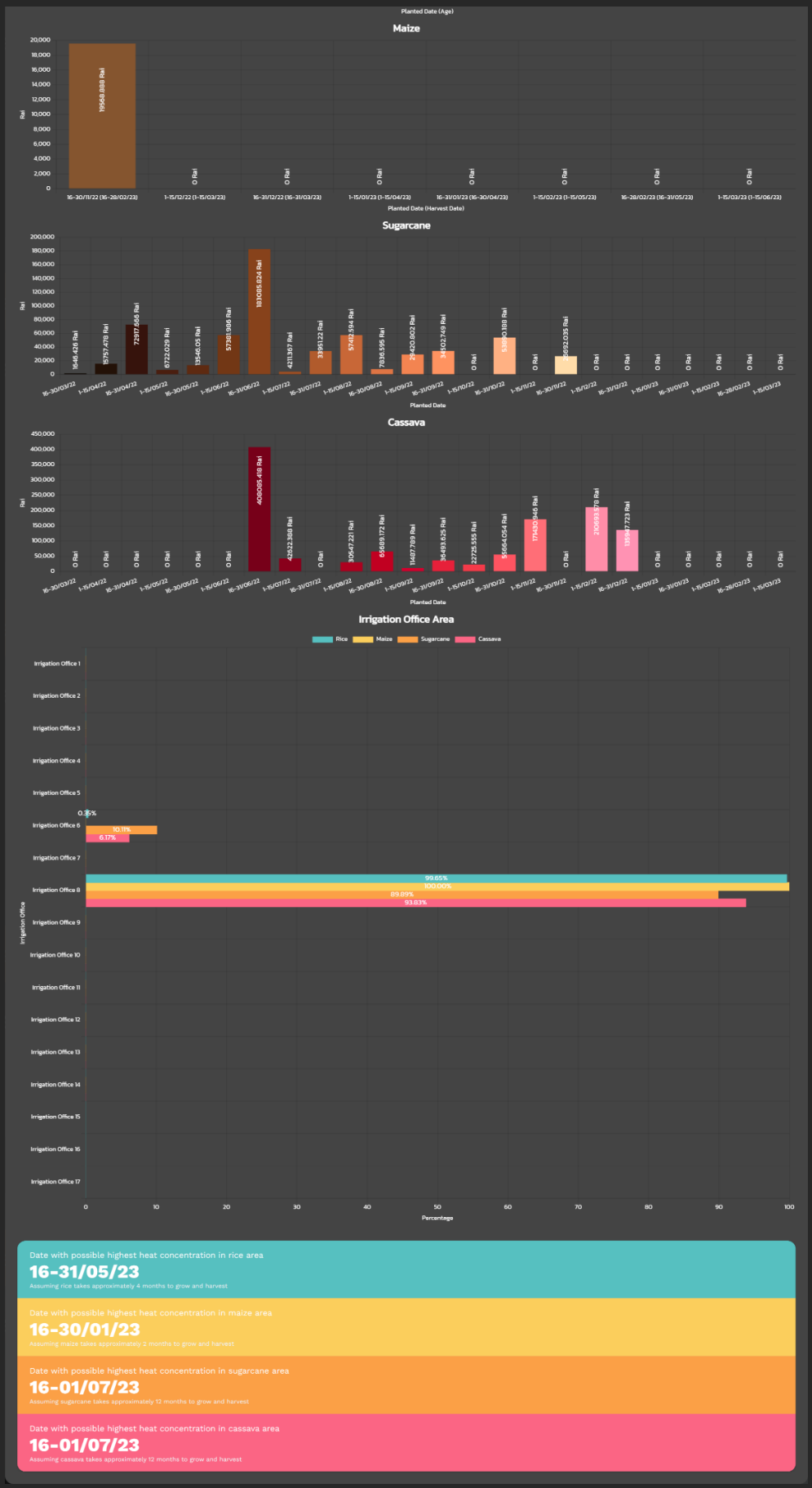


Figure 5: Expanded Analysis Page (Light Mode)

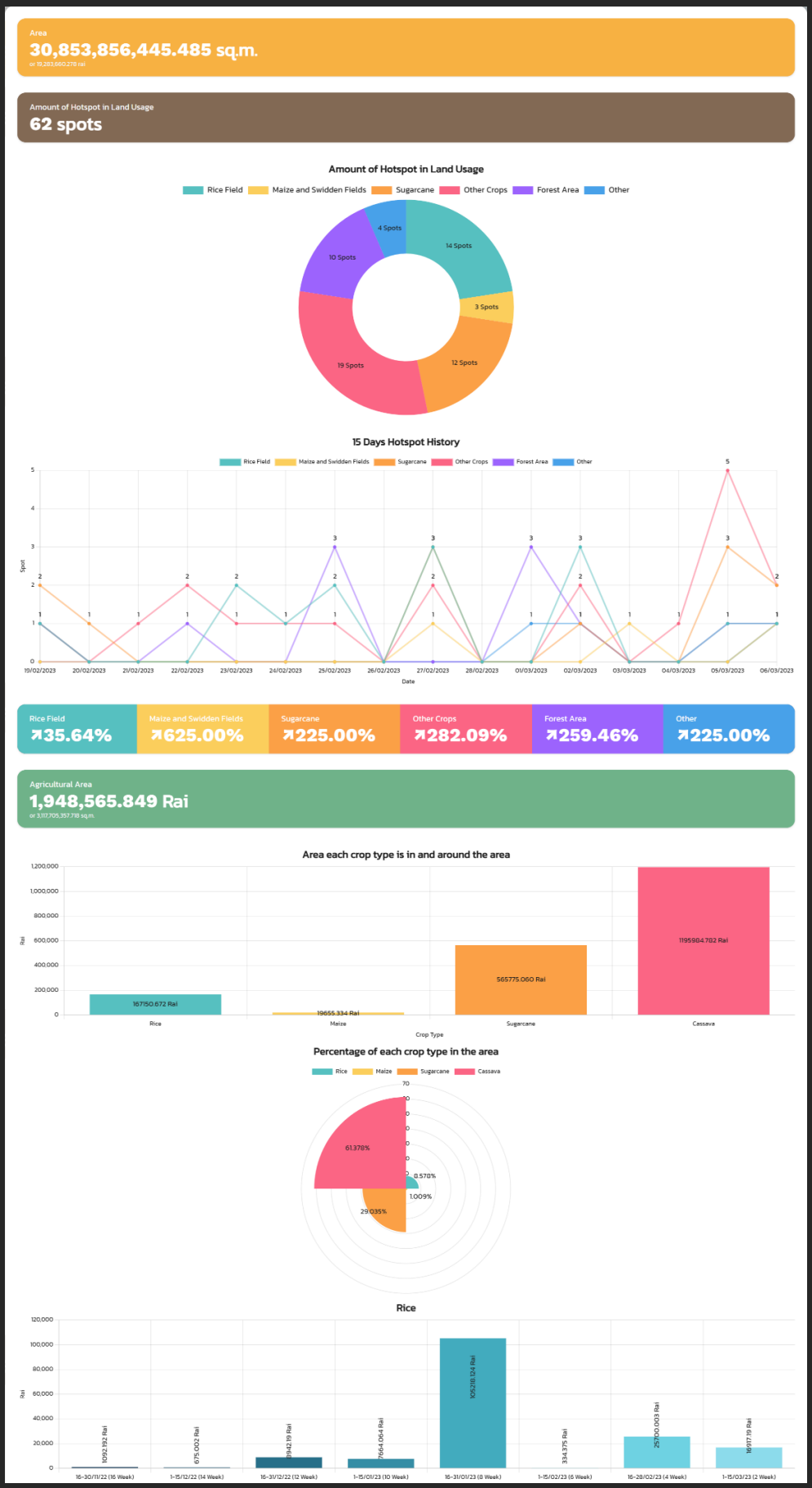
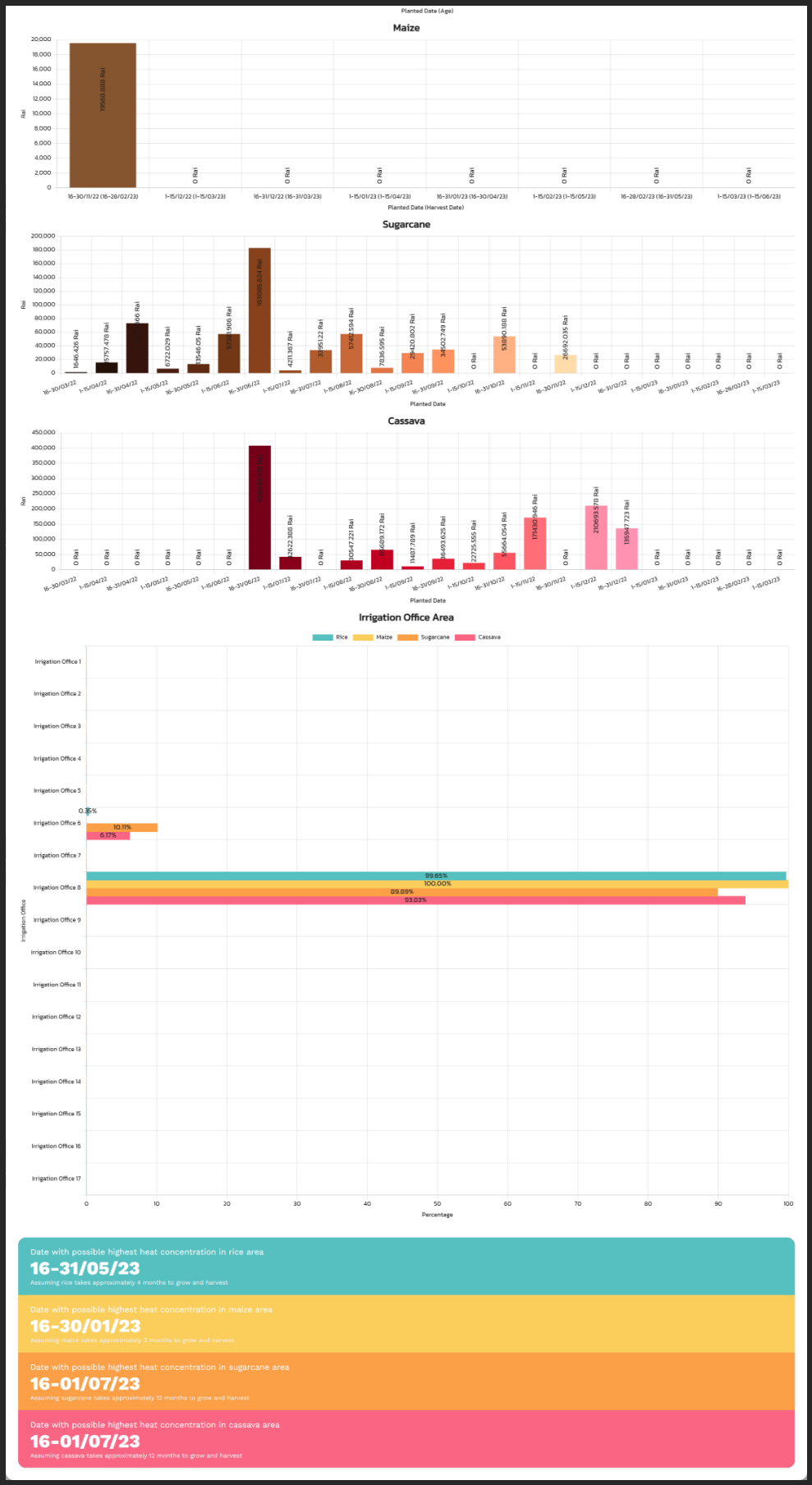



Figure 6: Expanded Analysis Page – Continue (Light Mode)