

# Revolutionising Crop Residue Burning Mitigation with Satellite-Powered Insights

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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.

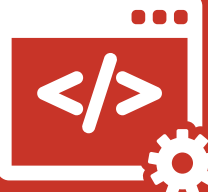
GISTDA offers services such as optical satellites, radar satellites, measurement devices, unmanned aerial vehicles (UAVs), and information & analytics.


## 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**  


**Frontend Development**  


**API Development**  


**Backend Development and Database Management**  


**Design and Internationalisation**  


**Geospatial Analysis and Data Visualisation**  

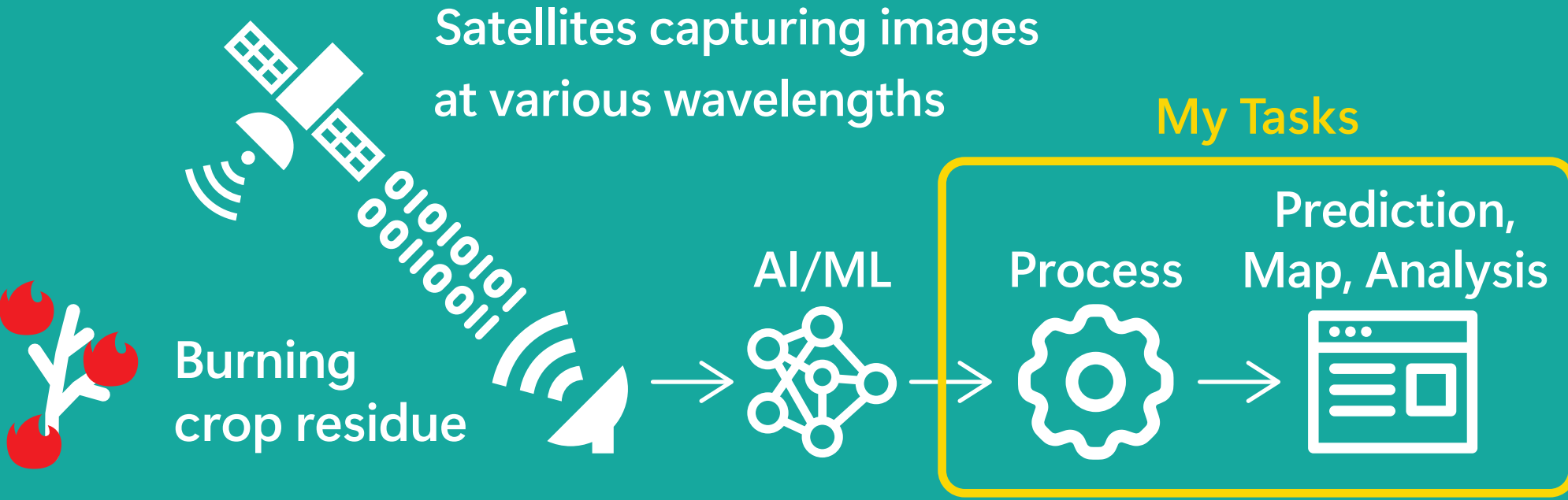

**Operating System**  


**Repository and Version Control**  

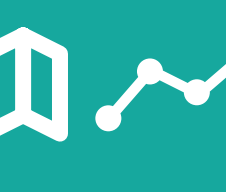




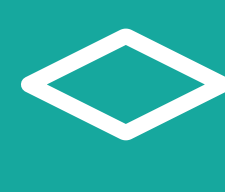









## DEVELOPMENT OVERVIEW

**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**



**Data**  
.shp .csv .xlsx

**.wkb**  
(Well-Known Binary)

**Spatial Analysis**

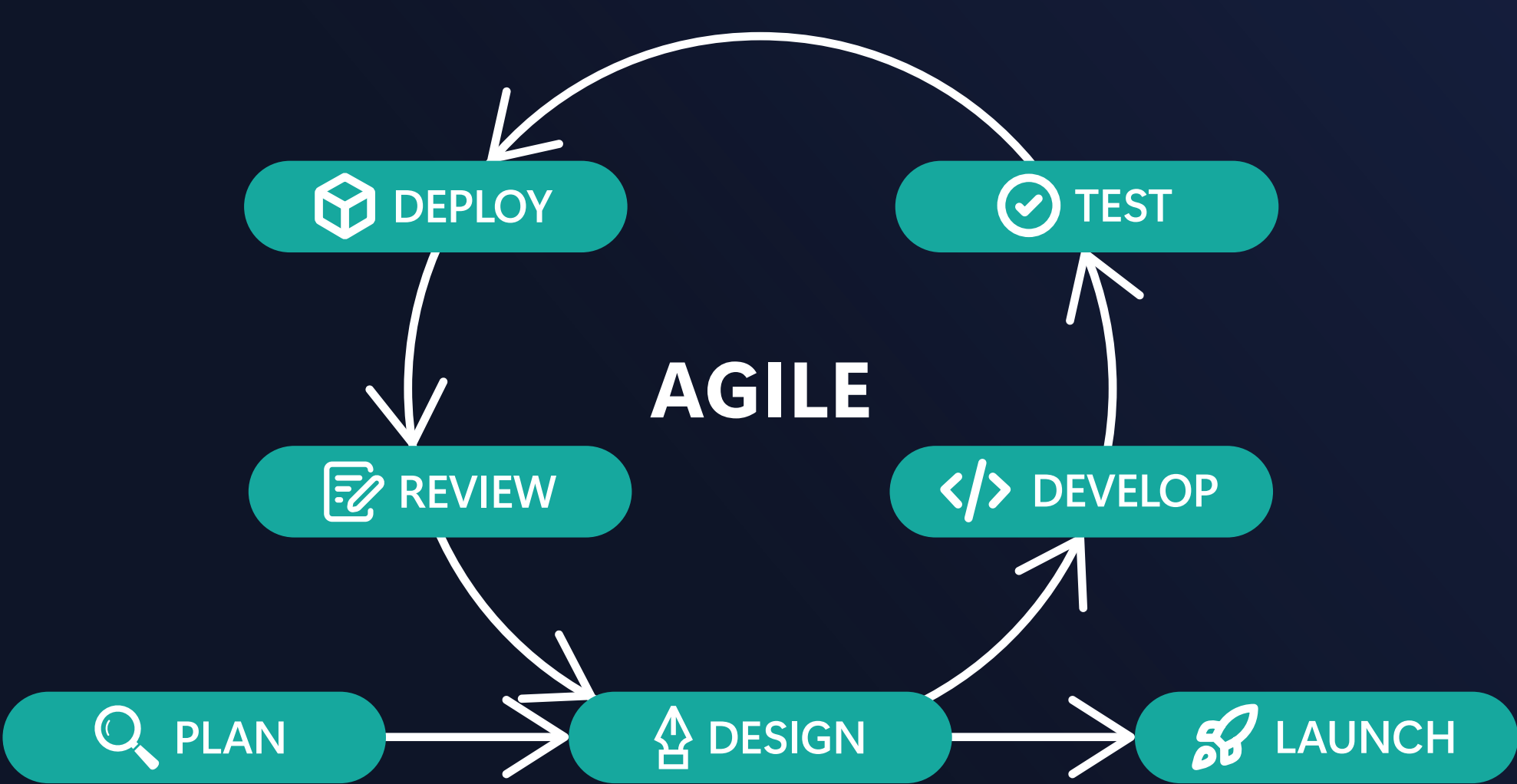
**.wkt**  
(Well-Known Text)

**Map Layer**  
(GeoJSON)

**Overlaying multiple layers**  
to create a complex map

**Display prediction, map 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

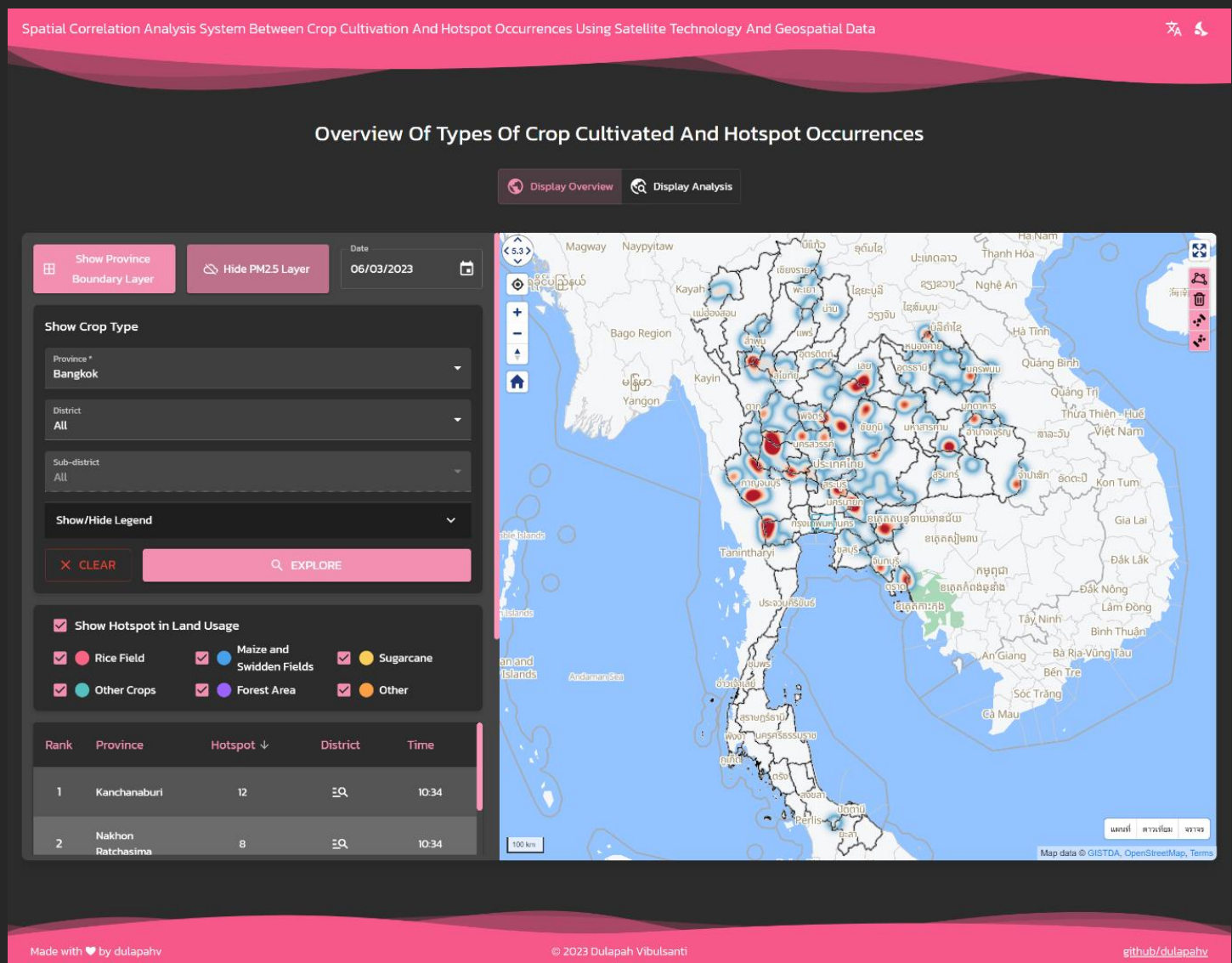


Figure 2: Analysis Page

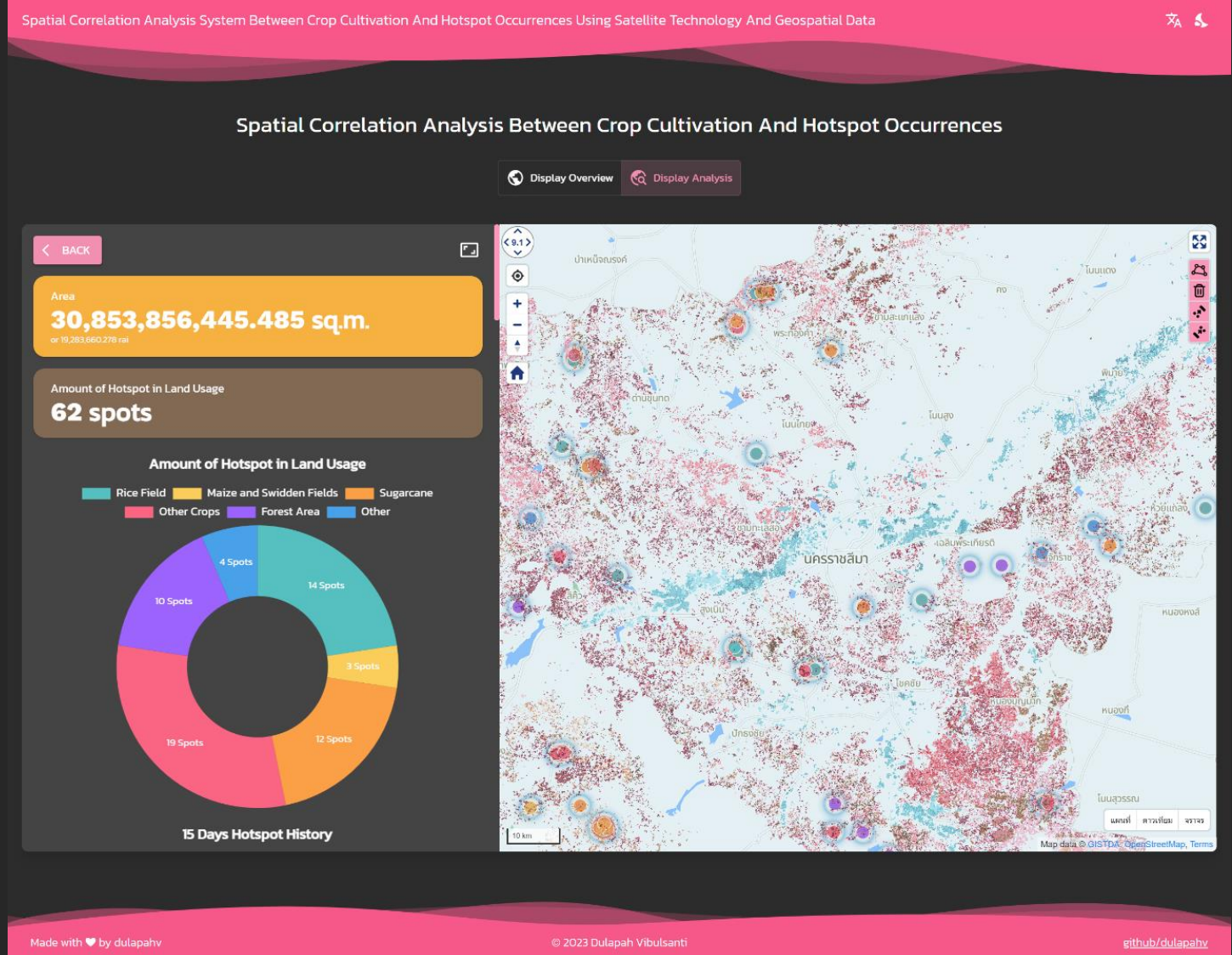


Figure 3: Expanded Analysis Page (Dark Mode)

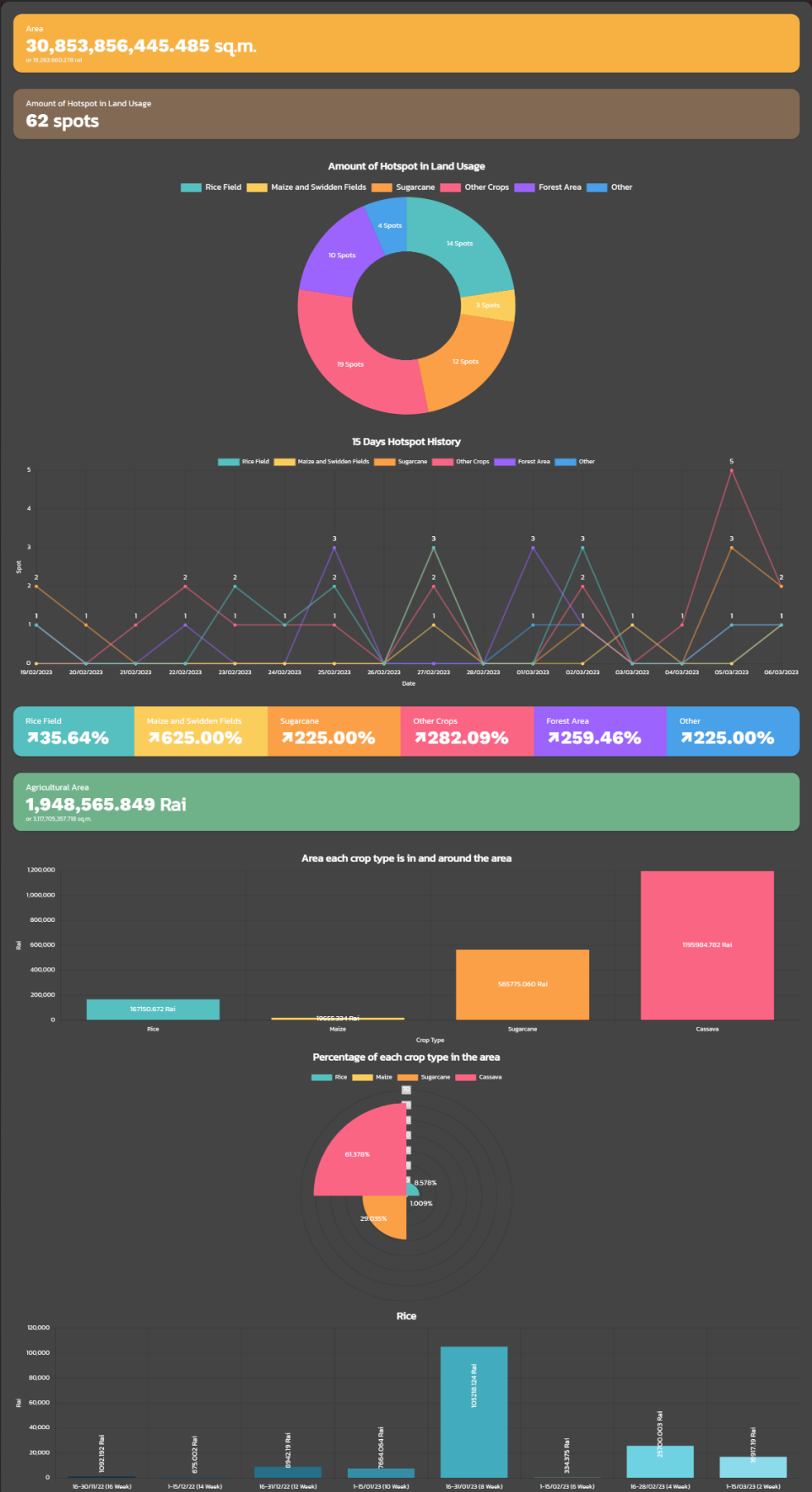
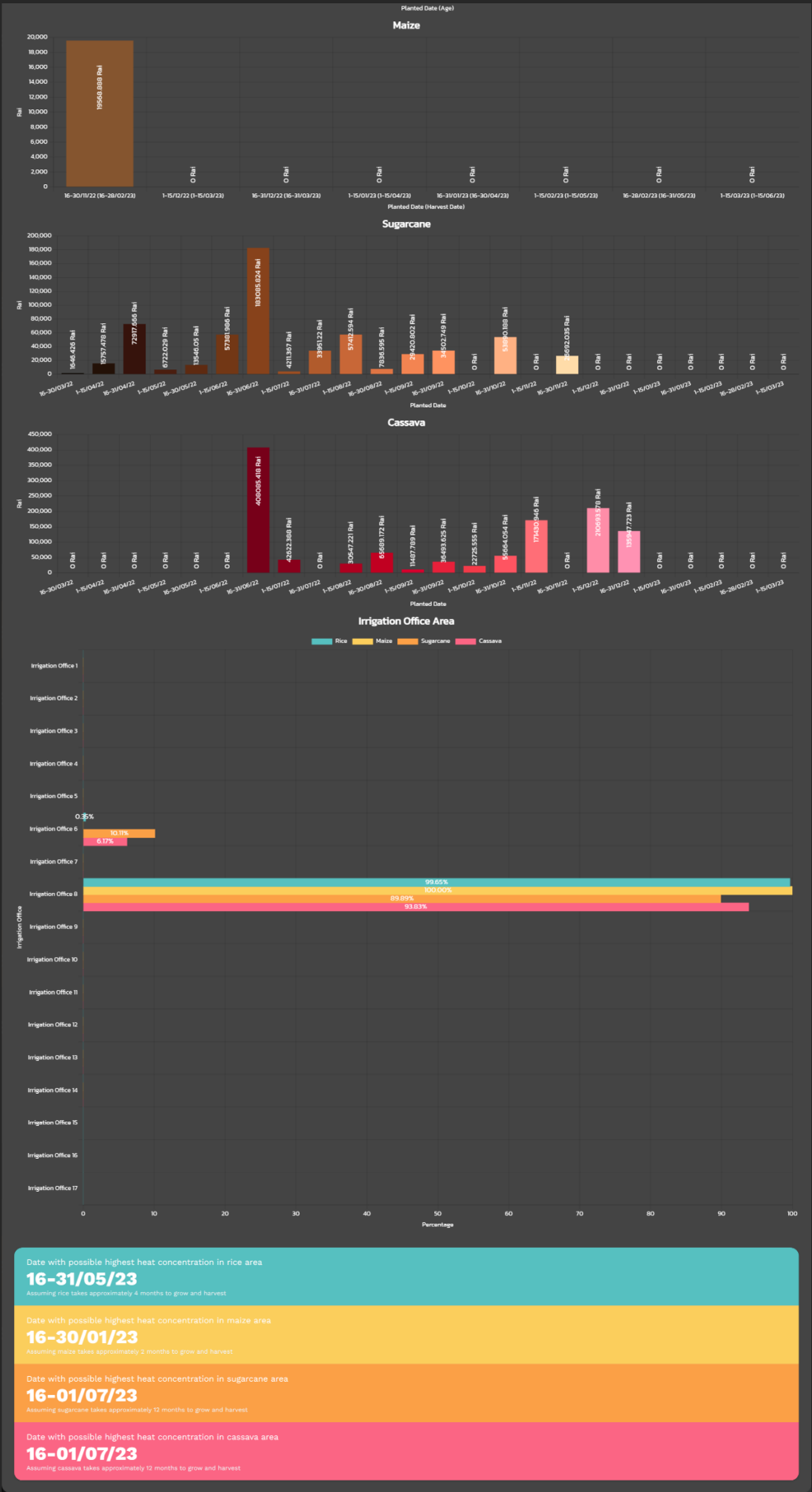


Figure 4: Expanded Analysis Page – Continue (Dark Mode)



# Figure 5: Expanded Analysis Page (Light Mode)

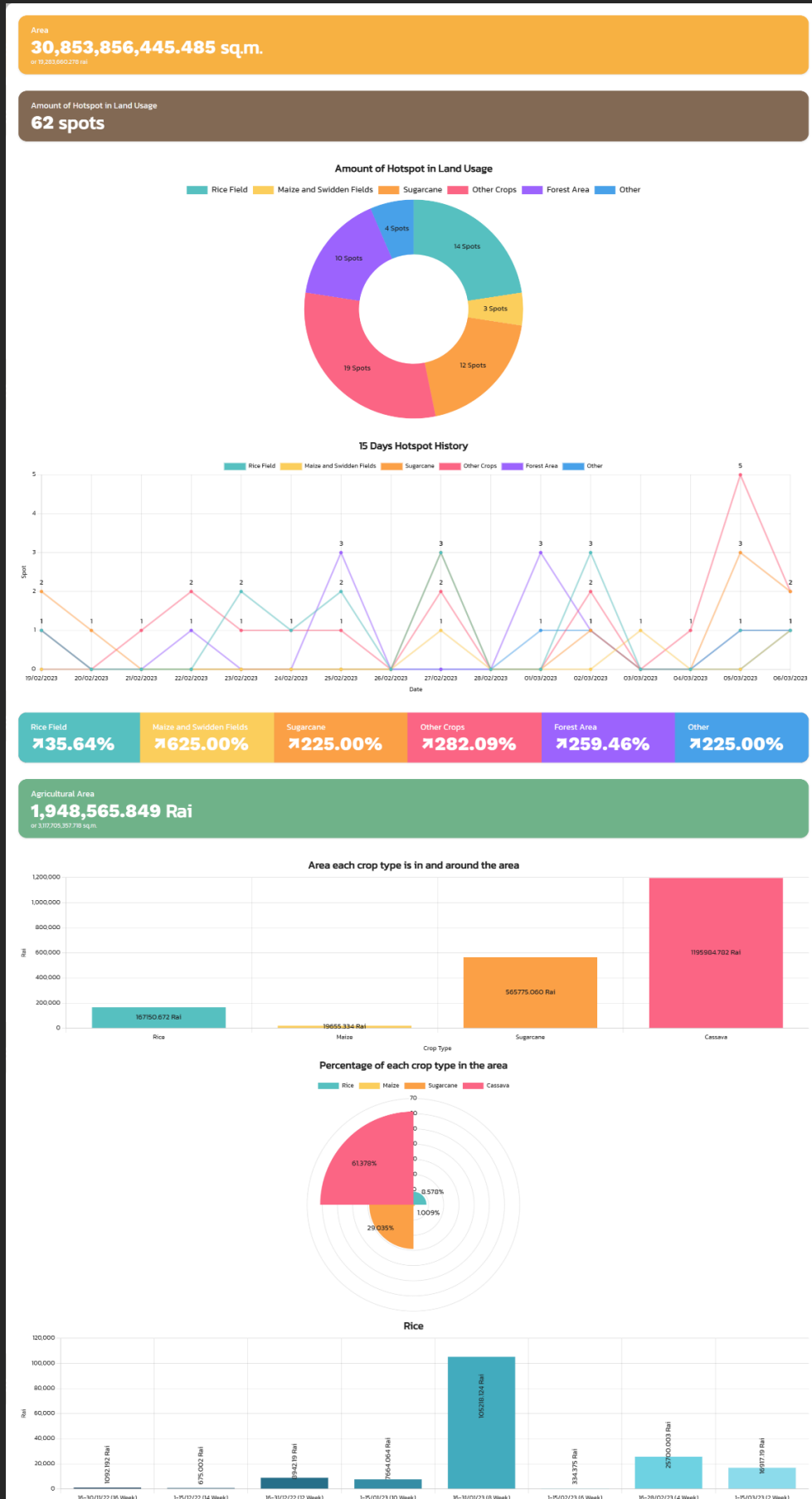


Figure 6: Expanded Analysis Page – Continue (Light Mode)

