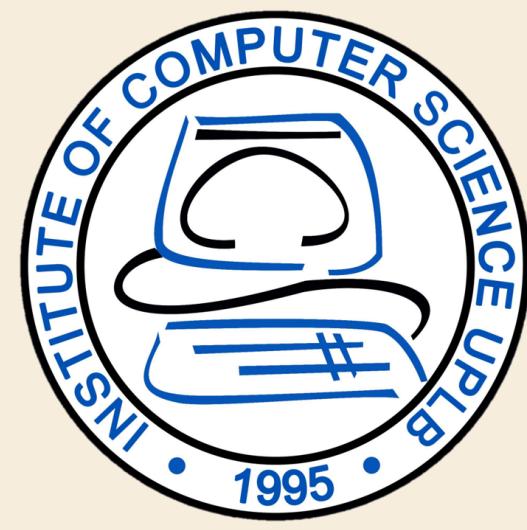




SAKAHAN

A Web-GIS Application with Dynamic Data Management
for Crop Suitability Mapping in the Philippines

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Introduction

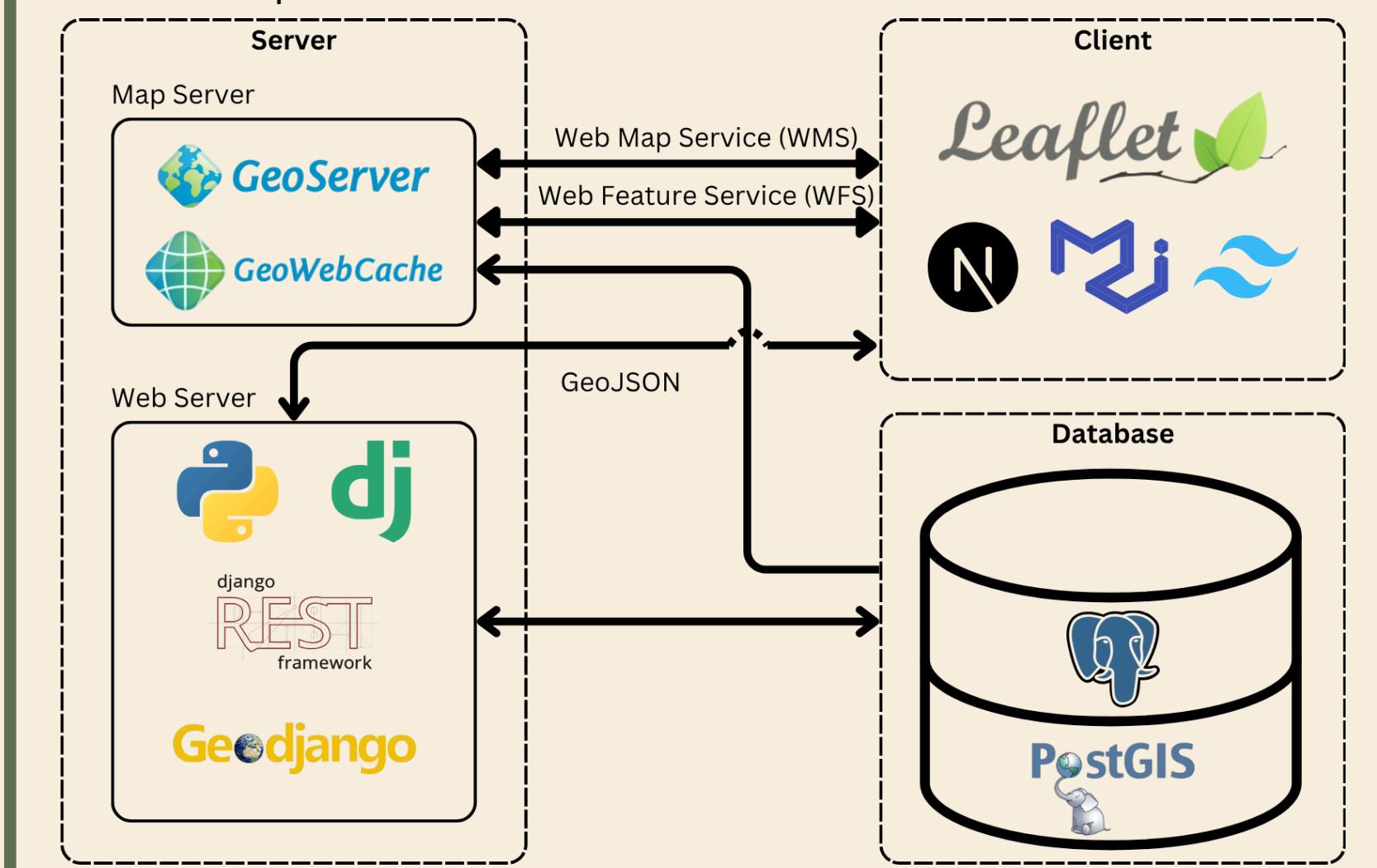
Agriculture in the Philippines benefits from fertile soils and favorable climate, yet declining soil fertility and stagnant agricultural land use pose serious challenges to food security and economic growth. While existing crop suitability mapping tools like NCCAG and SARAI provide valuable insights, they are limited by lack of dynamic data management to account new crop suitability information overtime. This study presents SAKAHAN, a Web-GIS application designed to map crop suitability across the Philippines with integrated data management features. SAKAHAN aims to support data-driven agricultural planning and improve crop productivity through effective suitability mapping.

Results

- Average SUS Score: 78.88 (B+ rating), indicating above-average usability.
- Participant Feedback: 95% expressed willingness to contribute data and average rating of 8.6/10 reflects strong belief in its real-world impact.
- Expert Feedback: Validated the concept as practical and valuable, with recommendations for remote sensing integration.

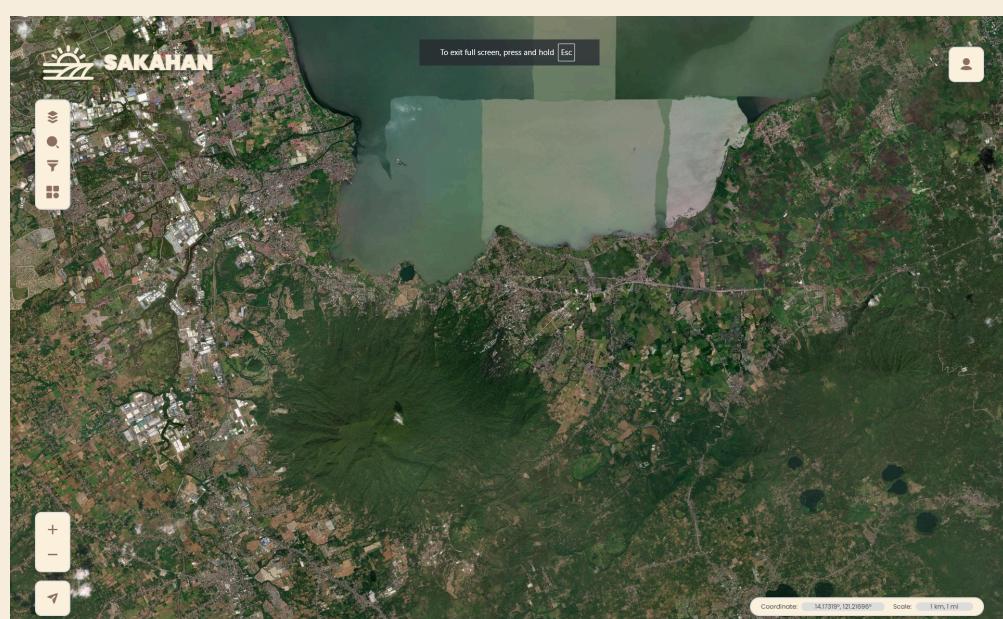
Methodology

SAKAHAN is a Web-GIS application developed for crop suitability mapping using free and open-source technologies. Spatial data were sourced from the Open Science Framework (OSF). The system adopts a hybrid client-server architecture to optimize performance, balancing server-side processing with efficient client-side rendering. The Map Server serves crop suitability layers through OGC-compliant services (WMS/WFS) with caching mechanisms. The Web Server manages dynamic data operations and system queries. The Client handles the user interface, enabling interactive map exploration. Finally, the Database stores both spatial and non-spatial data, supporting efficient data retrieval. All components are deployed using DigitalOcean with scalable services. Usability testing involved 20 participants using the System Usability Scale (SUS), along with a closed-door interview with a domain expert.

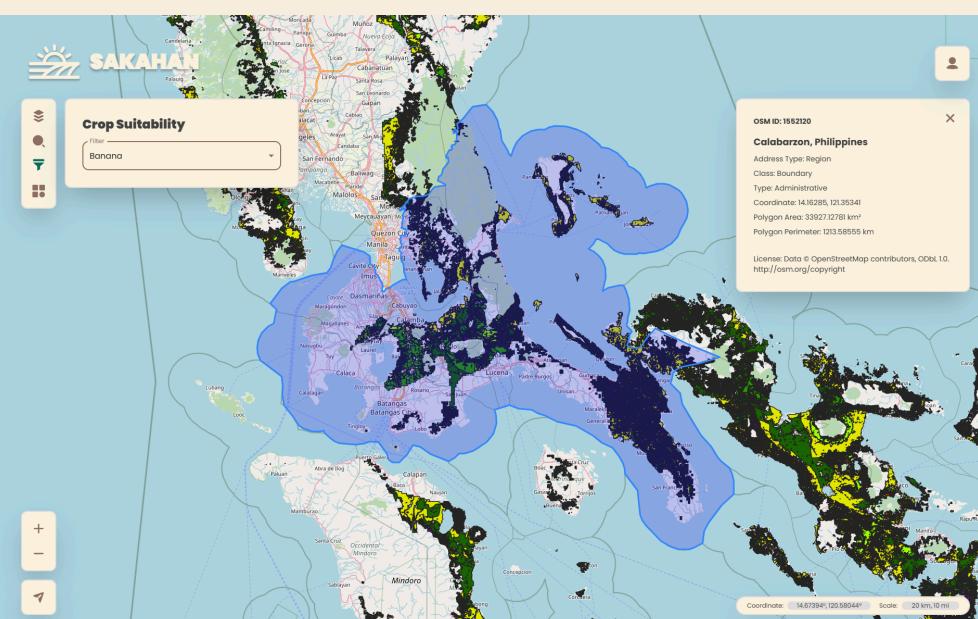


Conclusion

SAKAHAN is a Web-GIS application for crop suitability mapping in the Philippines. It met its objectives by providing key mapping features, dynamic data management, and user contribution tools. Usability testing yielded an average SUS score of 78.88 (B+ rating), indicating strong usability. Participants found the platform user-friendly, valuable for agricultural planning, and showed high willingness to contribute data. Expert feedback confirmed its practical potential and suggested future enhancements like remote sensing integration.



Viewing the Map



Getting Crop Suitability



Contributing More Data