

Knowledge Graph Land Use Project Proposal

I. Executive Summary

The USDA and local farmers aim to maximize efficient land use for agriculture and green energy developments. However, finding quality land within Ohio's state boundaries can prove challenging as it is affected by many conditions like soil quality, pollution, terrain, and other factors that influence crop growth efficiency. This project can assist lawmakers and local farmers in maximizing efficient land use by identifying locations best suited for an intended development. Additionally, the Ohio community has expressed a desire to identify the best non-agriculture land plots for green energy projects, like solar and wind. The intended impact of this project is to generate data to improve farmers' and lawmakers' decision-making for future agricultural or green energy projects' land-based needs.

II. Background

Sustaining agricultural practices has ensured human survivability for many centuries, and these practices are continually being improved upon with new technologies. This project will integrate modern knowledge graph techniques and raster satellite imagery to identify the best possible locations for future agriculture or green energy projects. In doing so, a data set can be generated that identifies the best potential locations for a project based on various geographic criteria.

III. Goal & Approach

This project aims to use knowledge graphs and raster satellite imagery to generate a data set containing information on premium-quality land that can be used for future agriculture or reusable energy projects. Depending on the defined conditions, such as the type of crop to be grown, the data set will contain information about a specific geographic location, such as the terrain, soil type, potential disaster areas, available water resources, etc., that can be evaluated as a good or bad candidate for one of the aforementioned projects. To generate this data set, the following tools will be used:

- KnowhereGraph
- QGIS (or ArcGIS)
- yEd

- A database yet to be chosen.

The timeline to implement these solutions will take about six months to complete. The data presented in the tools used for this project must be analyzed and a knowledge graph must be designed. A database will need to be decided on, and backend services that utilize this data will need to be constructed and integrated with the other tools. The first three months of the project will focus on:

- Becoming familiar with the project tools
- Analyzing the initial data
- Creating a detailed knowledge graph

The remaining three months will be spent developing backend services to store and present the final data set in a human-readable way.

IV. Conclusion

By effectively utilizing and combining advanced technologies such as knowledge graphs and satellite imagery, it can improve future agricultural and energy land use efficiency. State officials and farmers will greatly benefit from having a quality dataset that can be used for decision-making regarding agricultural and energy development. Optimizing land use will generate many benefits for Ohio, such as enhancing food security, growing the local economy, and increasing access to reusable energy. These project goals align with both local and global communities in an effort to create a more sustainable future.