Ministry of Agriculture, Food and Rural Affairs
Republic of Korea

Web mapping and monitoring tools

STATISTICS FROM SPACE

Next-Generation Agricultural Production Information for Enhanced Monitoring of Food Security in Mozambique

IFPRI

ITC UNIVERSITY OF TWENTE.

UNIVERSIDADE EDUARDO MONDLANE

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1 Purpose of the platform

1 To allow users in the Ministry and elsewhere to visualise, query, and download data collected and created in the Statistics from Space project.

2 To support fieldwork with real time monitoring of field data collection.

3 To demonstrate how open-source geospatial technology can improve the detail, quality, consistency, and accessibility of information about agriculture and crops.

2 Demonstration

During this stage of the project, the platform can be accessed at this URL

https://mapfra.itc.utwente.nl

This presentation first demonstrates some of the functionality and then explains the opensource technology that the platform is built on.

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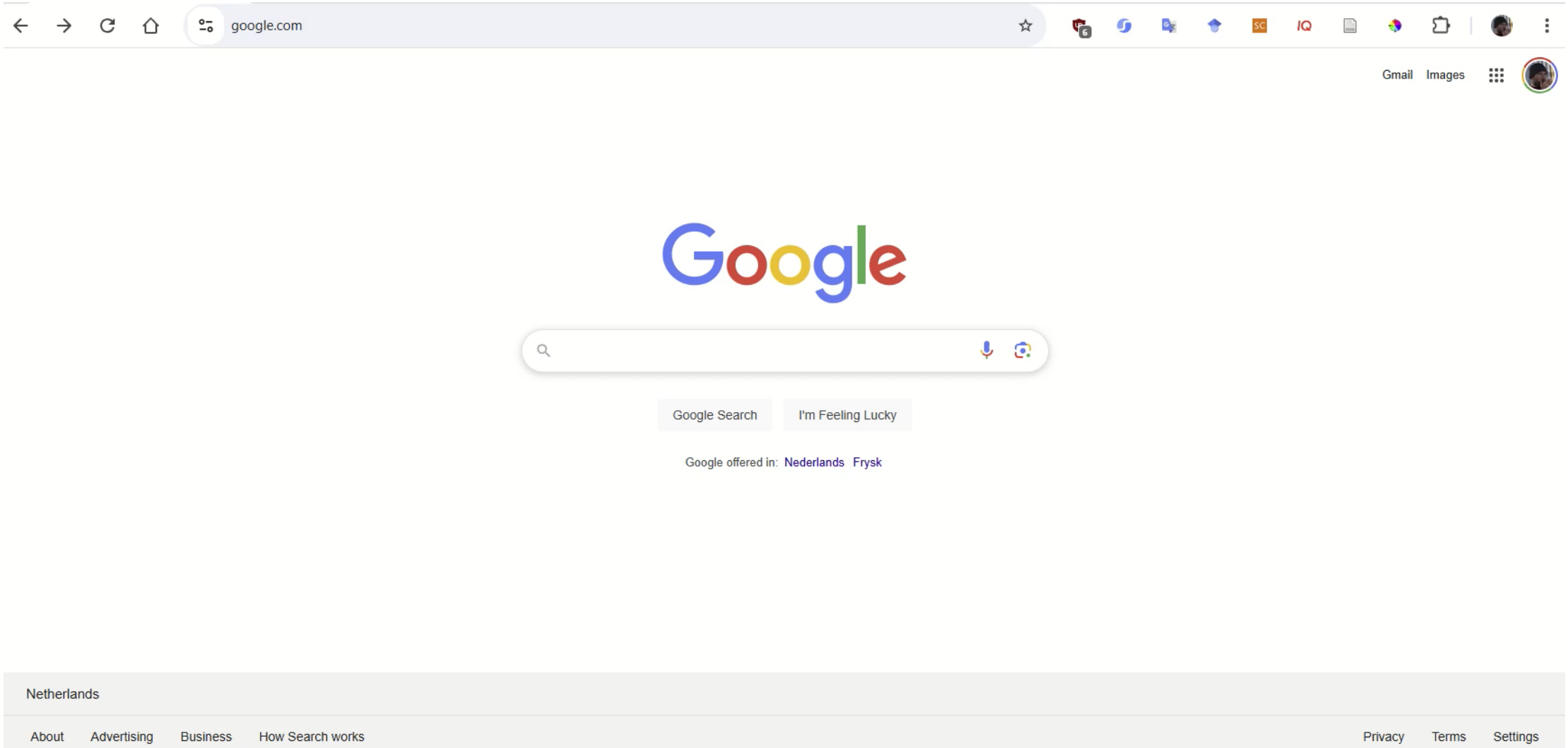

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3 Technology behind the platform

1 Front-end The front-end components of the platform have been built using TerriaMap and TerriaJS which are open-source frameworks for building web-based geospatial visualization platforms.

TerriaMap provides a dynamic and interactive user interface for exploring spatial datasets. These technologies enable integration of various geospatial data formats and standards, including WMS, WFS, WMTS, and 3D terrain visualisation. TerriaMap and TerriaJS are built using the React JavaScript library.

For a detailed user guide on TerriaMap, please refer to the official documentation created by the TerriaJS team, available at the following publicly accessible webpage https://userguide.terria.io

3 Technology behind the platform

2 Back-end The backend runs on FastAPI which is a modern, high-performance web framework for building APIs with Python.

We use this to serve data to the front-end through various endpoints. Apart from serving API function, FastAPI has also been used in the backend to serve dynamic HTML pages for the fieldwork monitoring, “About us” section and downloading offline basemap.

3 Technology behind the platform

3 Storage PostgreSQL is the underlying database management system from which we use to store all the vector datasets for the project.

It is a powerful, open-source relational database management system known for its robustness, scalability, and extensibility.

3 Technology behind the platform

4 Data Collection tool For field data collection, the platform uses Open Data Kit (ODK), an open-source mobile data collection tool.

The ODK application has been customized to exclude fieldwork photos from immediate submission, allowing users to upload images at a later stage.

Additionally, several XLSForms and supporting datasets have been developed to facilitate crop statistics collection and farmer interviews across the three provinces.

3 Technology behind the platform

5 GeoServer We publish all the data that are visualized in the platform via GeoServer.

GeoServer is an open-source server for sharing, processing, and publishing geospatial data using open standards such as WMS, WFS, and WCS.

3 Technology behind the platform

6 Hosting & Deployment The platform is currently hosted within the IT infrastructure of the University of Twente, with plans to transition deployment to the Ministry of Agriculture in Mozambique in 2025.

To facilitate seamless deployment and scalability, the codebase and deployment configurations are containerized using Docker, enabling automated deployment and version control.

The source code is maintained within the University of Twente's GitHub repository and will be transferred to the Ministry during the training and handover phase in the 2nd half of 2025.

Thank you

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