

Francis Michael Msangi

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Address: Arusha, Tanzania (Home)

● ABOUT ME

Geospatial Data Scientist and GIS Specialist with hands-on experience in spatial analysis, remote sensing, and machine learning. Proficient in Python, R, SQL, and JavaScript, with strong expertise in spatial-temporal analytics, geostatistics, and cloud-based tools such as Google Earth Engine. I apply data-driven methods to address challenges in agriculture, climate change, urban planning, and natural resource management, providing actionable insights to support evidence-based decision-making.

● KEY SKILLS

Technical Skills:

- **GIS & Remote Sensing:** ArcGIS, QGIS, ERDAS, ENVI, Google Earth Engine, GRASS GIS
- **Programming & Analytics:** Python (Pandas, NumPy, Geopandas, xarray, rasterio, shapely, Scikit-learn, TensorFlow), R (tidyverse, sf, terra, caret, mlr3), JavaScript, SQL, PostgreSQL, Git, Github
- **Machine Learning & Predictive Modeling:** Spatial modeling, time series forecasting, classification models, regression analysis
- **Geospatial Data Science:** Spatial-temporal analysis, suitability analysis, geostatistics, raster and vector processing
- **Cloud & Big Data Processing:** Google Earth Engine, ETL (FME), geospatial database management
- **Data Visualization & Business Intelligence:** Tableau, ggplot2, Matplotlib, Seaborn

Soft skills:

Project Management | Team Collaboration | Critical Thinking | Problem Solving | Communication | Attention to Detail

● WORK EXPERIENCE

 **INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (IITA) – ARUSHA, TANZANIA**

RESEARCH ASSISTANT - GIS & DATA SCIENCE SPECIALIST – 11/2020 – 08/2022

- Developed machine learning models to forecast crop yields using spatial-temporal datasets, enhancing predictive accuracy for regional planning and food security assessments.
- Led suitability analyses for agricultural land use, integrating remote sensing and climate data to identify optimal locations for targeted interventions.
- Processed and analysed over 20 years of climate and vegetation data to assess long-term trends in rainfall and temperature, supporting climate adaptation research.
- Cleaned and managed large-scale survey datasets (e.g., 5,000+ records) covering farmer demographics, ensuring data quality for econometric and geospatial analysis.
- Applied advanced spatial statistics and machine learning in R and Python to extract actionable insights, contributing to peer-reviewed publications and donor reports.

● EDUCATION AND TRAINING

09/2022 – 03/2024 Münster, Germany

MASTER OF SCIENCE IN GEOSPATIAL TECHNOLOGIES (ERASMUS MUNDUS) University of Münster, Universitat Jaume I, Universidade NOVA de Lisboa

Website <https://www.uni-muenster.de/en/> or <https://www.uji.es/> or <https://www.unl.pt/en> |

Field of study Geospatial technologies, Information and Communication Technologies | **Final grade** 17/20 B+ |

Thesis Integrating spatial heterogeneity to enhance spatial temporal crop yield predictions

Link <http://hdl.handle.net/10362/166038>

Website <http://www.aru.ac.tz/> |
Field of study Geographic Information systems, Remote sensing, Photogrammetry , Land survey and Engineering |
Final grade GPA 3.7/5 | **Thesis** Rainfall and temperature trends for suitable adaption strategies in Agriculture a case of Morogoro

PUBLICATIONS

2023
[Assessing the skill of gridded satellite and reanalysis precipitation products over in East and Southern Africa](#)

Muthoni, F. K., Msangi, F. M., & Kigosi, E.(2023). Atmósfera, 37, 481–500.

PROJECTS

Crop Yield Prediction Model

- Developed a machine learning model integrating spatial heterogeneity to improve crop yield forecasts across diverse environmental conditions (Master's thesis project)

Link <http://hdl.handle.net/10362/166038>

R Package Development

- Designed and implemented the climateTR package for temporal aggregation and trend analysis of gridded climate data in R

Link <https://github.com/FrancisMsangi/climateTR?tab=readme-ov-file>

LANGUAGE SKILLS

Mother tongue(s): **SWAHILI**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C2	C2	C2	C2	C2
GERMAN	A1	A1	A1	A1	A1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

I hereby declare that the information provided in this CV is true and complete to the best of my knowledge

24/06/2025