CALVIN SAMWEL SWAI

Geospatial and Environmental Science Professional

📍 Enschede, Netherlands.   📞 +31685243357   ✉ calvinsamwel94@gmail.com

in www.linkedin.com/in/calvin-samwel-swai   ○ https://github.com/CalvnSamwel

SUMMARY

Innovative Geospatial and Environmental Scientist with an MSc in Geo-Information Science and Earth Observation, specializing in agricultural resource monitoring, soil fertility management, and climate risk analysis. Extensive experience utilizing remote sensing technologies and big data solutions to develop actionable insights for precision agriculture, soil health, and crop management. Proficient in integrating sensor data, machine learning models, and geospatial analysis to deliver high-quality, real-time insights for optimizing farm management and improving sustainability. Skilled at collaborating with stakeholders to drive data-driven decision-making, particularly in mitigating the impacts of climate change on agricultural ecosystems.

PROFESSIONAL EXPERTISE

- Remote Sensing Technologies (Optical & Radar).
- Soil and Crop Health Monitoring.
- Machine Learning & Statistical Analysis.
- Tools (ArcGIS, QGIS, Google Earth Engine, Rasterio, GDAL, xarray,TensorFlow, PyTorch)
- Spatial database Management (ESRI, FME, SQL).
- GIS Workflow Development & Automation.
- Environmental Monitoring & Impact Measurement.
- Programming and Automation (R, Python, JavaScript)
- Precision Agriculture & Sustainability Practices

PRACTICAL EXPERIENCE

Geospatial and Remote Sensing Consultant   2023 – 2024

Vitens, Zwolle, Netherlands

- Developed geospatial workflows to analyze soil moisture and groundwater impacts on agricultural productivity using Sentinel-1 data, providing reliable insights to optimize water resource management.
- Implemented statistical models (CDF, ELPF) to derive Root Zone Soil Moisture (RZSM), enhancing precision agriculture practices by improving accuracy in water absorption predictions for crop growth.
- Spearheaded crop condition analysis using NDWI and NIRv indices to assess the effects of drought and waterlogging on vegetation health, enabling farmers to make informed decisions in real-time.

Geospatial and Remote Sensing Scientist   2023 – 2024

University of Twente, Enschede, Netherlands

- Applied Sentinel-1 and Sentinel-2 data for developing indices to monitor vegetation productivity and soil fertility, delivering essential insights into crop health and nutrient availability.
- Conducted research on drought anomalies and their impact on agricultural ecosystems, providing actionable insights into water management strategies for farmers.
- Collaborated with agricultural stakeholders to develop geospatial solutions for nutrient monitoring and sustainable crop management.

Environmental and Geospatial Consultant.   2021 – 2023

Aquila Eyes Group Limited, Morogoro, Tanzania

- Led the design of geospatial platforms for soil fertility assessment and crop nutrient management, utilizing optical remote sensing and sensor technologies to monitor agricultural health in real-time.
- Developed machine learning models to identify patterns in soil nutrient levels and provide recommendations for precision fertilization, improving overall farm productivity and sustainability.
- Provided real-time data to farmers and agronomists, helping to optimize decision-making regarding fertilization and harvesting schedules.

Geospatial Data Consultant.   2020

Tanzania Resilience Academy, Morogoro, Tanzania

- Mapped over 100,000 trees and identified nutrient deficiencies across diverse agricultural areas, contributing to environmental conservation and sustainable farming practices.
- Developed real-time data visualization tools for farmers, enabling on-the-spot decisions regarding soil and crop health management.

TRAINING AND MENTORING EXPERIENCE

Learning Assistant.   2023-2024

Faculty of Geo-Information Science and Earth Observation (ITC) of the University of Twente, Netherlands.

Training Program Host.   2021 and 2022

Belt and Road International Geospatial Information Training Centre, Tanzania.

EDUCATION

MSc in Geo-Information Science and Earth Observation, Water Resources and Environmental Management.   2022- 2024

Twente University, Netherlands.

- **Grade:** 9/10 (**Cum Laude**)
- **Thesis Title:** Unravelling the Spatial-Temporal Dynamics of Drought Anomalies and Their Interactions with Vegetation.
- **Thesis Supervisors:** Dr. Yijian Zeng and Dr. Ir. Salama Suhyb.
- **Thesis Summary:** My Thesis aimed at addressing the limitations in surface and root zone soil moisture measurements for drought monitoring and the complexities in the time series interactions between drought and vegetation anomalies using open-source remote sensing products and statistical methods namely; Convergent Cross Mapping, Cumulative Distribution Function and Exponential Low Pass Filter.

Machine Learning and Deep Learning for Environmental Monitoring   2021

Wuhan University

- **Grade:** Pass
- **Special Project :** Flood Monitoring in Pakistan.

BSc in Environmental Science and Management.   2017-2020

Sokoine University of Agriculture, Tanzania

- **Grade:** GPA 3.7
- **Special Project Supervisor:** Dr. Douglas Mushi

AWARDS AND HONORS

- Graduated Cum Laude, University of Twente.   2024
- OKP-ITC Co-Financed Scholarship by Nuffic.   2022
- Cultural Promoter Award by Director of Liesmars.   2021

FEATURED PUBLICATIONS

- **Calvin Samwel Swai (2024)**; Unraveling the Spatial-Temporal Dynamics of **Drought Anomalies** and Their Interactions with Vegetation. (https://purl.utwente.nl/essays/102081).
- Neema Sumari, Fanan Ujoh, **Calvin Samwel Swai**, and Muchen Yang (2023); Urban growth dynamics and expansion forms in 11 Tanzanian cities from 1990 to 2020 (https://doi.org/10.1080/17538947.2023.2218114).
- Neema Sumari, Paulo Mandela, and **Calvin Samwel Swai** (2022); Impact of Urban Expansion on Land Surface Temperature in Dodoma and Morogoro Metropolises, Tanzania. here.

PROFESSIONAL DEVELOPMENT

- Crop Mapping using Synthetic Aperture Radar (SAR) and Optical Remote Sensing, NASA   2024
- Evaluating Ecosystem Services with Remote Sensing, NASA   2023
- Intro to ISO 14001:2015 EMS-Environmental Management System, Udemy   2022
- Data Science: Python for Data Analysis 2022 Full Boot camp, Udemy   2021

LANGUAGES

- **English and Swahili**: First language
- **Dutch**: Elementary Proficiency