

CURRICULUM VITAE

DR. JOHN MWANZIA MUSAU, PhD

Lecturer, Department of Environmental Sciences
School of Agriculture, Environment & Health Sciences,
Machakos University

Personal Data

Name: John Mwanzia Musau
Date of Birth: 1st October, 1987
Place of Birth: Machakos County
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Career objective

My research aims to promote better understanding of biophysical interactions and feedbacks in the soil-vegetation-atmosphere interface in water limited ecosystems. My research interests focus on three main themes: (i) assessment of potential effects of climate and land use changes on water and energy balance across different spatial and temporal scales, (ii) quantification of ecosystem services resilience to environmental changes, and (iii) application of remote sensing and geographic information systems in assessment of environmental systems. Particularly, I am interested in application of models driven by Earth observation and other geospatial data to investigate the spatial and temporal patterns and impacts of past and future environmental changes.

Personal attributes

- i. **Professionalism:** conscientious and efficient in meeting results while observing deadlines
- ii. **Planning & Organizing:** Effective time management and formulation of clear goals that are consistent with agreed strategies and priorities
- iii. **Team work:** by genuinely valuing ideas and expertise of others to build collaborative achievements while establishing and maintaining effective working relations

Areas of research interest

Hydrological modeling; Watershed management; Application of Remote Sensing and GIS in water and land resource management; Water quality monitoring; Groundwater modelling; Climate change impacts assessment, Programming and data analysis in R software, Environmental Impact Assessment

Academic qualifications

September 2015- December 2020: **PhD. Environmental Science**

Bangor university, United Kingdom (UK).

Research topic: “Land Use/Cover Change Impacts on Water and Energy Balance in East Africa Region”.

May 2012- 2015: **Msc. Environmental Engineering and Management**

Jomo Kenyatta University of Agriculture and Technology (JKUAT).

Thesis title: “Assessment of Hydrological Responses to Climate Change in Mt. Elgon Watersheds, Kenya”.

2007- 2011: **Bachelor of Environmental Planning and Management (First Class Honors)**

Kenyatta University.

Professional Experience

October 2021 – To date **Lecturer**; Department of Environmental sciences; School of Agriculture, Environment and Health Sciences; Machakos University.

2017- 2021 **Tutorial Fellow**; Department of Environmental sciences; School of Environment and Natural Resource Management; Machakos University.

July- sept 2014 **Visiting Research scholar** at the NASA Jet Propulsion Laboratory (JPL) in Pasadena, California, USA. Responsibilities focused on:

- Assimilation of satellite data in hydrological modelling using the Variable Infiltration Capacity (VIC) model for drought assessment and prediction in East Africa region
- Automatic calibration of VIC model to optimize regional soil parameters

2013- 2017 **Research Fellow**; World Agroforestry Centre (ICRAF); Nairobi. Responsibilities/ activities focused on:

- Assessment of land cover change impacts on water and energy balance in East Africa;
- Remote sensing data processing and analysis;
- Assimilation of remote sensing data in land surface modelling.

Feb- June 2012 **Consultant**, Somalia Water and Land Information Management (SWALIM), FAO Somalia. Responsibilities included:

- High resolution satellite image classification
- Mapping of cultivated areas in southern Somalia using medium and high-resolution satellite images

2011 - 2012 **Consultant**, Regional Centre for Mapping of Resources for Development (RCMRD), Nairobi, Kenya. Responsibilities included:

- Satellite image processing, interpretation and classification
- GIS field data collection and analysis
- Producing reports with geographic data visualizations

University teaching experience

Courses currently teaching or I have taught:

Principles of environmental science, Geospatial techniques, Remote sensing for environmental

science, Geoinformatics, Environmental Ecology, Integrated watershed management, Environmental modelling, and Environmental innovations and technologies.

Awards and Scholarships

2015 - 2020: PhD Research Scholarship, Awarded by the World Agroforestry Centre (ICRAF), Nairobi, Kenya

July, 2014 – Sept 2014: Visiting Research scholar at the NASA Jet Propulsion Laboratory (JPL) in Pasadena, California, USA

2013 - 2015: Master of Science Research Scholarship, Awarded by the World Agroforestry Centre (ICRAF), Nairobi, Kenya

Professional and competency development training

March –Apr 2024 Blended Learning Quality Assurance: Fundamentals for Higher Education, Self-paced online course offered by the Commonwealth of Learning

March –Apr 2022 Principles and Advances in Earth Observation course offered by the EOAFRICA Research and Development Facility

March –Apr 2022 Cloud Computing and Algorithms for Earth Observation Analyses course offered by the EOAFRICA Research and Development Facility

January 2022 Using Earth Observations for Pre- and Post- Fire Monitoring course offered by NASA Applied Remote Sensing Training Program (ARSET)

January 2022 Building Climate Resilience through Ecosystem-based Adaptation Planning, an online course offered through the UN Climate Change Learning Partnership (UN CC:Learn)

December 2021 Socioeconomic Valuation of Degraded Lands and Wetlands (Applications of the COLWED GIS-based Tool), a course offered by Geospatial Research International

December 2021 Solid waste management course offered by Environment Protection Training and Research Institute (EPTRI) Hyderabad, Telangana, India

September 2019 Course on Satellite Earth Observation images applications at the SIA – (Scuola di Ingegneria Aerospaziale) of the Sapienza University of Rome, Italy

October 2018 Training course on resource mobilization and grant proposal writing offered by the Training Centre in Communication Africa

April 2013 Training course on Statistics in Agricultural climatology: Using climate data effectively. The course offered by the University of Reading, UK

Administrative appointments and responsibilities

Mar 2024 – To date: **Deputy Director**, Directorate of Quality Assurance, Machakos University

2020 – To date: **Member**, Research and Innovation committee, School of Environment and Natural Resources Management, Machakos University

- 2018 – To date: **Coordinator**, Student Field/Industrial attachment,
School of Environment and Natural Resources Management, Machakos University
- 2018 – To date: **Champion**, Website Development,
School of Environment and Natural Resources Management, Machakos University
- 2018 – 2019: **Champion**, Corruption Risk Assessment and Mitigation,
School of Environment and Natural Resources Management, Machakos University

Participation in Research and Development projects

- 2024 - 2027 **Grant Project Implementation:** A project on Enriching youth digital, media, and soft skills using virtual mobility experiences in Sub-Saharan Africa and the EU (DigiTREE), funded by EU through the ERASMUS-EDU-2023-VIRT-EXCH call.
- 2022 - 2023 **Co-researcher:** Assessment of the impacts of COVID-19 on community conservation and nature-based tourism enterprises in the Amboseli ecosystem in Kenya.
- 2022 - 2023 **Grant Project Implementation:** The Kenya Rangelands Ecosystem Services pRодукtivity (RangER) Programme funded by the European Union. The collaborating partners are: Northern Rangelands Trust (NRT), European Union (EU) in Kenya, E4Impact, World Agroforestry (ICRAF), Jomo Kenyatta University of Agriculture and Technology (JKUAT), Community Safety Initiative (CSI), and AMAYA Triangle Initiative (ATI) counties of Baringo, Laikipia, Samburu and Isiolo.
- 2021 - 2022 **Grant Project Implementation:** Project on Water Productivity Improvement in Practice (WaterPIP) for Kenya based on open access and remote sensing data, implemented by the Association of Irrigation Acceleration Platform (AIAP) with funding from the IHE Delft Institute for Water Education (IHE Delft).

Membership to Professional bodies

- i. **Lead expert**, National Environment Management Authority (NEMA) – 12275
- ii. **Member**, Association of Irrigation Acceleration Platform (AIAP)
- iii. **Member**, International Association of Hydrological Sciences
- iv. **Member**, Association for Geographic Information

Relevant Publications in refereed journals

1. **Musau, J.**, Patil, S., Sheffield, J., and Marshall, M. (2018) Vegetation dynamics and responses to climate anomalies in East Africa, *Earth Syst. Dynam. Discuss.*, <https://doi.org/10.5194/esd-2017-123>.
2. **Musau, J.**, Patil, S., Sheffield, J., and Marshall, M. (2016) Spatio-temporal vegetation dynamics and relationship with climate over East Africa, *Hydrol. Earth Syst. Sci. Discuss.*, <https://doi.org/10.5194/hess-2016-502>.
3. Coulibaly, Y.J., Mbow, C., Sileshi, G.W., Beedy, T., Kundhlande, G. and **Musau, J.** (2015) Mapping Vulnerability to Climate Change in Malawi: Spatial and Social Differentiation in the Shire River Basin. *American Journal of Climate Change*, 4, 282- 294. <http://dx.doi.org/10.4236/ajcc.2015.43023>

4. **Musau, J.**, Sang, J., Gathenya, J., Luedeling, E. (2015), Hydrological responses to climate change in Mt. Elgon watersheds. *Journal of Hydrology: Regional Studies*, <http://dx.doi.org/10.1016/j.ejrh.2014.12.001>
5. **Musau, J.**, Sang, J., Gathenya, J., Luedeling, E. and Home, P. (2014), SWAT model parameter calibration and uncertainty analysis using the HydroPSO R package in Nzoia Basin, Kenya, *Journal of Sustainable Research in Engineering* 1 (3) 2014, 17-29

Publications in conference proceedings

1. **Musau, J.**, Sang, J., Gathenya, J. (2013). General Circulation Models (GCMs) Downscaling Techniques and Uncertainty Modeling for Climate Change Impact Assessment, Proceedings of 2013 Mechanical Engineering Conference on Sustainable Research and Innovation, Volume 5, 24th - 26th April 2013

Referees

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