

**Name:** Yakob Umer  
**Designation:** Regional Researcher – Water Risks and Data Science Specialist  
**Research Group:** Water Data for Climate Resilience (WDCR)  
**Key Expertise:** Hydro-Informatics, Hydrometeorology/Climate Resilience, Flood Risk modeling (Riverine flood, Urban flood, and Flash flood), Drought Management and resilience  
**Duty Station:** IWMI-South Africa  
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## SUMMARY OF EXPERIENCE

Yakob is an experienced hydroinformatics expert with a Ph.D. from the University of Twente, specializing in Multi-Hazard and Risk Reduction. His expertise includes integrated hydrometeorological modeling for flood Risks and Damage Assessment, Modeling different flood types – Riverine floods, Flash floods, and Urban floods, Climate impact assessment, and Nature-based solutions for water risk reduction, particularly in data-scarce environments. His research background involves regional climate modeling and enhancing numerical weather prediction -WARF models for improved rainfall simulation, Climate change impact assessment on water availability, Developing Landslide early warnings, and developing flash flood modeling systems in the data-scarce region. At the International Water Management Institute (IWMI), Yakob develops integrated flood early warning systems for major African river basins, including the Zambezi, Black Volta, and Upper Blue Nile. He also designs multi-hazard indices (Floods, Droughts, and heatwaves) for climate risk reduction and resilience and develops parametric flood insurance products, leveraging early warning system data to create index-based solutions. He is a recognized expert in multi-and compound water risk modeling, using tools such as LISFLOOD-FP, openLISEM, HEC-RAS, HEC-HMS, SWAT, and WRF-Hydro. His modeling and analysis are supported by strong programming capabilities in Python and JavaScript and geospatial processing using ArcGIS, QGIS, and Google Earth Engine. In addition, Yakob has authored and co-authored several scientific journal articles and has led capacity development training workshops for the flood early warning system.

## EDUCATION

- Ph.D., Multi-hazard and Risk reduction - ITC-University of Twente, Enschede, Netherlands, 2021
- MSc., Water Science and Engineering - Specialization in Hydroinformatics, UNESCO IHE Institute for Water Education, Delft, Netherlands, 2013
- MSc., Meteorology Science, Arba Minch University, Arba Minch, Ethiopia, 2010
- BSc., Meteorology Science, Arba Minch University, Arba Minch, Ethiopia, 2007

## EMPLOYMENT HISTORY

- Regional Researcher – Water Risks and Data Scientist Specialist, International Water Management Institute (January 2023 – Present)
- Postdoctoral Researcher – Blueprint for Landslide Early Warning System in Indonesia (January 2021 – December 2022)
- PhD Research, ITC, University of Twente, Netherlands (May 2016 – April 2021)
- Research associate, Addis Ababa University, Ethiopia (2015-2016)
- Lecturer, Arba Minch University, Ethiopia (2009-2010)
- Graduate assistant, Arba Minch University, Ethiopia (2007-2009)

**COUNTRIES OF EXPERIENCE:** Zambia, Uganda, Ethiopia, Ghana, Indonesia, Netherlands

**LANGUAGES** *Indicate all of your working languages. Delete section if English only.*

Language skills	Speaking	Reading	Writing
English	Excellent	Excellent	Excellent

### SAMPLE WORKS

- Coupled global and regional climate models with HEC-HMS, which was then coupled with LISFLOOD-FP for Blue Nile river flood modeling – simulated flood risk and assessed floodplain management strategies.
- Coupled openlsem and wrf model for flash flood modeling - simulated flood hazard and assess flood risk management strategies
- Coupled lisflood-fp with wflow hydrological model for fews in volta basin
- Coupled lisflood-fp and hec-ras model with wflow hydrologic to develop flood parameters used for index based flood insurance - product developed and implemented in Zambia as climate risk resilient option for smallholder farmers

### KEY PROJECTS

Regional Researcher – Water Risks and Data Science (AICCRA, CLIMBER, UKAMA USTAWI, and DIWASA projects); South Africa; (January 2023 – to date).

**Role:** Contributing to the overall project activities and implementations:

- Developing flood inundation modeling for integrated flood early warning systems (FEWS) in the major African river basins.
- Support the development of the hydrological model for a flood early warning system.
- Ensure the quality of the flood model products and complement them with satellite flood extent maps.
- Provide training and capacity building for government institutions on flood modeling and products for flood risk management.
- Develop flood products for parametric risk insurance.
- Develop multi-hazard indices for climate risk reduction and resilience.
- Stakeholder engagement, support the development and implementation of climate risk reduction tools and mechanisms in the project implementation country.

### **Project Coordinator and Researcher – Postdoctoral Researcher on Project: A Blueprint for an Indonesian Landslide Early Warning System (BILEWS) (January 2021 – December 2022)**

**Role:** **Hydrology model expert** to scientifically explore the possibility of deriving local alarm levels for rainfall-fed landslides and debris flows that are sufficiently reliable to become operational. these local

alarm levels could serve as the basis for an operational landslide early warning system (BILEWS) in Java, Indonesia: main features and deliverables: research article and project report.

### Researcher - Flood Hazard Modelling in The Data-scarce Areas (2016 – 2020)

**Role:** Conduct Research Related to Hydrometeorological Modeling and Extreme Event Analysis for Localized Flood Hazard Modeling in Data-scarce Areas. Main Project Features: Planning, Research, And Production of deliverables including research articles, and conference papers.

**Researcher - Project:** Adapting Mechanism for Climate Change Impact on Hydrological Extremes and Crop Production a Joint UNEP/UNDP Program (Climate Change Adaptation and Development Initiative, CC DARE) (2010 – 2011).

**Role: Team leader, joint research investigator:** modelling and extracting hydrometeorological extremes, writing research reports describing the final model tool. stakeholder engagement and holding a workshop on indicators for indigenous climate adaptation mechanisms. **Main project features:** assessing the adaptation mechanism for hydrological extreme events under changing climate conditions.

### KEY PUBLICATIONS

- *Fekadie Bazie Enyew, Dejene Sahlu, Gashaw Bimrew Tarekegn, Yakob Umer, Belen Marti-Cardona, Bedassa R. Cheneka, Daniel Asfaw Bekele, Daniel Ayalew Mengistu, Sarkawt Hama, Zinaw D. Shenga, Sisay E. Debele.* 2025. Future Changes in Rainy Seasons in the Upper Blue Nile Basin: Impacts on Agriculture and Water Resources. <https://doi.org/10.1016/j.nhres.2025.06.002>
- *Tilahun Wubu Tiku, Gashaw Bimrew Tarekegn, Dejene Sahlu, Gezahagn Bekele Teshebo, Fekadie Bazie Enyew, Yakob Umer, Sisay E. Debele.* 2025. Evaluating CMIP6 Precipitation Simulations Across Different Rainfall Regimes in the Amhara Region, Ethiopia. <https://doi.org/10.1016/j.nhres.2025.03.002>
- **Umer, Y.M.; Sisay E. Debele; Chizya Mvula; Giriraj Amarnath; Moses N. Chisola and Belen Marti-Cardona.** 2024. Nature-Based Solutions for River Restoration and Flow Management: The Case of Kitwe City, Zambia. DOI: <http://dx.doi.org/10.5772/intechopen.1007632>, accepted for publication.
- *Padhee, Suman Kumar; Amarnath, Giriraj; Umer, Y.M.* 2024. Development of an operational flood early warning system for Black Volta River Basin, West Africa. In Adams III, T. E.; Gangodagamage, C.; Pagano, T. C. (Eds.). Flood forecasting: a global perspective. 2nd ed. London, UK: Academic Press. pp.27-39. [doi: <https://doi.org/10.1016/B978-0-443-14009-9.00002-X>].
- **Umer, Y.M.; Jetten, V.; Ettema, J.; Steeneveld, G.-J.** Assessing the Impact of the Urban Landscape on Extreme Rainfall Characteristics Triggering Flood Hazards. *Hydrology*. 2023 | Journal article. DOI: [10.3390/hydrology10010015](https://doi.org/10.3390/hydrology10010015). EID: 2-s2.0-85146789969. Part of ISSN: [23065338](https://doi.org/10.3390/hydrology10010015).
- **Umer, Y.M.; Jetten, V.; Ettema, J.; Lombardo, L.** Application of the WRF model rainfall product for the localized flood hazard modeling in a data-scarce environment. *Natural Hazards*. 2022 | Journal article. DOI: [10.1007/s11069-021-05117-6](https://doi.org/10.1007/s11069-021-05117-6). EID: 2-s2.0-85122093457. Part of ISSN: [157308400921030X](https://doi.org/10.1007/s11069-021-05117-6).
- **Umer, Y.M.; Ettema, J.; Jetten, V.; Steeneveld, G.-J.** Impact of the Updated Urban Fraction on Extreme Rainfall Simulation Using the Wrf Model Over Kampala, Uganda. *SSRN* 2022 | Other. DOI: [10.2139/ssrn.4236311](https://doi.org/10.2139/ssrn.4236311). EID: 2-s2.0-85177984730. Part of ISSN: [15565068](https://doi.org/10.2139/ssrn.4236311).
- **Umer, Y.M.; Janneke Ettema; Victor Jetten; Gert-Jan Steeneveld.** Impact of the improved urban fraction on rainfall simulation using the WRF model over Kampala, Uganda. 2022-06-28 | Preprint. DOI: [10.5194/ems2022-521](https://doi.org/10.5194/ems2022-521).
- *Ratna Satyaningsih; Victor Jetten; Janneke Ettema; Ardhasena Sopaheluwakan; Danang Eko Nuryanto; Umer, Y.M.; Tri Astuti Nuraini; Rian Anggraeni.* Dynamic Rainfall Thresholds for

Landslide Early Warning System in Progo Catchment, Java, Indonesia. 2022-03-28 | DOI: [10.5194/egusphere-egu22-12227](https://doi.org/10.5194/egusphere-egu22-12227)

- **Umer, Y.M.** Janneke Ettema, Victor Jetten, Gert-Jan Steeneveld, Reinder Ronda. Evaluation of the WRF model to simulate a high-intensity rainfall event over kampala, uganda. 2021. Water (Switzerland). DOI: [10.3390/w13060873](https://doi.org/10.3390/w13060873). EID: 2-s2.0-85103490342. Part of ISSN: [20734441](https://doi.org/10.3390/w13060873)
- Ratna Satyaningsih; Victor Jetten; Janneke Ettema; Ardhasena Sopaheluwakan; Danang Eko Nuryanto; **Umer, Y.M.** Landslide Early Warning in Indonesia: A Gap Analysis. 2021-06-18 | Other. DOI: [10.5194/ems2021-339](https://doi.org/10.5194/ems2021-339).
- **Umer, Y.M.**; Jetten, V.G.; Ettema, J. Sensitivity of flood dynamics to different soil information sources in urbanized areas. Journal of Hydrology. 2019 | Journal article DOI: [10.1016/j.jhydrol.2019.123945](https://doi.org/10.1016/j.jhydrol.2019.123945),n EID: 2-s2.0-85069566148, Part of ISSN: [00221694](https://doi.org/10.1016/j.jhydrol.2019.123945).
- Amarnath, G.; **Umer, Y.M.**; Alahacoon, N.; Inada, Y. Modelling the flood-risk extent using LISFLOOD-FP in a complex watershed: Case study of Mundeni Aru River Basin, Sri Lanka. IAHS-AISH Proceedings and Reports. 2015 | Conference paper. DOI: [10.5194/piahs-370-131-2015](https://doi.org/10.5194/piahs-370-131-2015). EID: 2-s2.0-84954475311. Part of ISSN: [01447815](https://doi.org/10.5194/piahs-370-131-2015).

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[HTTPS://WWW.RESEARCHGATE.NET/PROFILE/YAKOB-UMER](https://www.researchgate.net/profile/Yakob-Umer)

**Google Scholar Score:** 95

**Research Gate Score:** 107