



Senior Research Scientist (Hydrology/Climate)

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Degrees

1997-2001

Bachelor of Science (Agricultural Engineering), KNUST, Ghana

2001-2003

Master of Science (Soil and Water), Wageningen University, Netherlands

2005-2008

PhD (Natural Science), University of Bonn, Germany

Profile

Emmanuel Obuobie is a Senior Research Scientist (Hydrology/climate) at the Water Research Institute of the Council for Scientific and Industrial Research (Ghana). He holds a Bachelor of Science Degree in Agricultural Engineering (2001) from the Kwame Nkrumah University of Science and Technology (Ghana), Master of Science Degree in Soil and Water (2003) from Wageningen University (The Netherlands) and PhD in Natural Science (2008) from the University of Bonn (Germany).

Emmanuel has wealth of experience and expertise in hydrology and water resources modelling, climate data analysis and statistical downscaling, climate change adaptation, groundwater resource assessment and recharge estimation, soil and water conservation, and irrigation. He has supervised and examined many post-graduate students at both masters and PhD levels, from Universities within and outside of Ghana.

He has won numerous research grants, either as the PI or Co-I, including grants from the Denmark Ministry of foreign Affairs/DFC; UK Research Councils; African Union; German Federal Ministry of Environment, Nuclear, Building and Nature; World Bank; and CGIAR-Challenge Programme for Water and Food. Emmanuel has consulted for many international organizations including UNDP, UNOPS, UNEP, and IWMI for over a decade in more than 21 African Countries.

He has served in various capacities on a number of national technical committees including the ODINAFRICA Marine and Coastal Atlas Development Committee, as a member and leader of the climate scenario sub-committee. Emmanuel has published 20 peer reviewed journal articles, most of which were published in international journals including Theoretical and Applied Climatology, Hydrological Sciences Journal, Hydrology, and International Journal of River Basin Management; 2 refereed books; and 10 refereed book chapters.

Awards and Recognitions

2016: Best Research Scientist from the Surface Water Division – CSIR-Water Research Institute

2005 - 2008: DAAD scholarship for PhD studies

2001 - 2003: Netherlands Water Partners' fellowship for master degree studies

Affiliations

MGSAE

Research Expertise & Interest

Climate downscaling; Climate change impact modelling in hydrology; water resources assessment; natural disaster risk reduction & management; groundwater recharge mechanisms & quantification; irrigated agriculture.

Current Research

Emmanuel Obuobie is a Senior Research Scientist in Hydrology and Climate. His works are centred on (i) climate change impact modelling on water resources and ecosystems for adaptation in river basin context, and (ii) reduction and management of natural disaster risks, particularly flood risk.

His research on climate change adaptation focuses on development and applications of climate and hydrological products, innovative decision support tools, and integrated modelling frameworks, to support the planning and implementation of water and ecosystem based adaptation.

The scope covers evaluation and comparison of satellite-based climate products, statistical downscaling and bias-correction of global and regional climate projections (climate scenarios), simulating the impacts of climate change on ecosystem benefits, surface- (water, sediment & nutrients) and ground-water hydrology, and testing of water and ecosystem based interventions to understand their potential to enhance resilience of river basins.

A substantial focus of this research is dedicated to development and testing of methodologies for integrating climate change scenarios, together with other development drivers such as the shared socio-economy pathways (SSPs) and land-use/-cover change, into basin water resources planning and management.

Emmanuel's research on disaster risk reduction hinges on flood simulation, flood frequency and risk analysis, and flood impacts under climate change and urbanization considerations. His research is supported by the UK Research Councils, Danish Ministry of Foreign Affairs/Danida Fellowship Centre, World Bank, and the African Union/European Union.

Current Projects

- Building Climate-Resilience into basin water management (CREAM)
Funded by: DFC; Period: 2019 – 2024
- Design and Assessment of resilient and sustainable interventions in water-energy-food-environment Mega-Systems (FUTUREDAMS)
Funded by: UK Research Councils; Period: 2017 – 2021
- Driving eco-innovation in Africa: capacity-building for a safe circular water economy (RECIRCULATE)
Funded by: UK Research Councils; Period: 2017-2021
- Disaster Risk Reduction Practice and Capacity Building Support to ECOWAS
Funded by: World Bank; Period: 2018 – 2019
- Multi-scale Flood Monitoring and Assessment Services for West Africa (MiFMAS)
Funded by: AUC/EU; Period: 2017 – 2020
- Effects of Climate Change on Lake Volta Resources (VOLTRES)
Funded by: DFC; Period: 2013 – 2019

List of Publications

A. JOURNAL PAPERS

1. Aziz, F., Obuobie, E., Sylla, M.B., Jeong, J. and Daggupati, P. (2018). Trends and projections of climate extremes in the Black Volta River Basin in West Africa. *Theoretical and Applied Climatology*, Vol. 113, Nos 3-4, <https://doi.org/10.1007/s00704-018-2609-z>.
2. Darko, D., Adjei, K.A., Odai, S.N., Obuobie, E., Asmah, R. and Trolle, D. (2018). Recent climate trends for the Volta Basin in West Africa. *Weather - Month 9999*, Vol. 99, No. 99, Royal Meteorological Society, doi:10.1002/wea.3303.
3. Darko, D., Adjei, K.A., Appiah-Adjei, E.K., Odai, S.N., Obuobie, E. and Asmah, R. (2018). Simulation of climate characteristics and extremes of the Volta Basin using CCLM and RCA regional climate models. *Theoretical and Applied Climatology*, <https://doi.org/10.1007/s00704-018-2485-6>
4. Aziz, F. and Obuobie, E. (2017). Trend analysis in observed and projected precipitation and mean temperature over the Black Volta Basin, West Africa, *International Journal of Current Engineering and Technology*, Vol.7, No.4, pp 1400-1412.
5. Logah, F.Y., Amisigo, B.A., Obuobie, E., and Kankam-Yeboah, K. (2017). Floodplain hydrodynamic modelling of the Lower Volta River Basin in Ghana. *Journal of Hydrology*, 14: 1-9; DOI: 10.1016/j.erh.2017.09.002.
6. Koffi, K.V., Obuobie, E., Banning, A., Wohnlich, S. (2017). Hydrochemical characteristics of groundwater and surface water for domestic and irrigation purposes in Veia catchment, Northern Ghana. *Journal of Environ Earth Sci* (2017) 76:185; DOI 10.1007/s12665-017-6490-3.
7. Cheke, R. A., Basañez, M.G., Perry, M., White, M.T., Garms, R., Obuobie, E., Lamberton, P. H. L. Young, S., Osei-Atweneboana, M.Y., Intsiful, J., Shen, M., Boakye, D. A., Wilson, M.D. (2015). Potential effects of warmer worms and vectors on onchocerciasis transmission in West Africa. *Phil. Trans. R. Soc. B* 370: 20130559, <http://dx.doi.org/10.1098/rstb.2013.0559>.
8. Agodzo, S.K., Obuobie, E., Braimah, C.A. (2014). The effects of irrigation dams on water supply in Ghana. *IOSR Journal of Engineering*, Vol.4, Issue 5, pp 48-53.
9. Obuobie, E., Ofori, D., Agodzo, S., and Okra, C. (2013). Groundwater potential for dry-season irrigation in north-eastern Ghana. *Water International* (2013), pp 1-16.
10. Kankam-Yeboah, K., Obuobie, E., Amisigo, B., Opoku-Ankomah, Y. (2013). Impact of climate change on streamflow in selected river basins in Ghana. *Hydrological Sciences Journal*, 58 (4),1–16
11. Logah, F.Y., Obuobie, E., Ofori, D., Kankam-Yeboah, K. (2013). Analysis of rainfall variability in Ghana. *International Journal of Latest Research in Engineering and Computing*, volume 1, Issue 1, pp 1-8.
12. Forkuor, G., Pavelic, P., Asare, E. and Obuobie, E. (2013). Modelling potential areas of groundwater development for agriculture in northern Ghana using GIS/RS. *Hydrological Sciences Journal*, 58 (2), 1–15, doi:10.1080/02626667.2012.754101
13. Obuobie, E., Kankam-Yeboah, K., Amisigo, B., Opoku-Ankomah, Y., Ofori, D. (2012). Assessment of vulnerability of river basins in Ghana to water stress conditions under climate change. *Journal of Water and Climate Change* 3(4): 276-286
14. Obuobie, E., Diekkruuger, B., Agyekum, W. and Agodzo, S. (2012). Groundwater level monitoring and recharge estimation in the White Volta River Basin of Ghana. *Journal of African Earth Sciences*, 71-72 (2012) 80-86.
15. Wilson, M.D., O sei-Atweneboana, M., Boakye, D.A., Osei-Akoto, I., Obuobie, E., Wiafe,

C. and Kiszewski, A. (2012). Efficacy of DEET and non-DEET-based insect repellents against bites of *Simulium damnosum* vectors of onchocerciasis. *Medical and Veterinary Entomology* (2012), pp 1-6, doi: 10.1111/j.1365-2915.2012.01054.x

16. Obuobie, E., Diekkrüger, B. and Reichert, B. (2010) Use of chloride mass balance method for estimating Groundwater recharge in northeastern Ghana. *International Journal of River Basin Management*, 8: 3, 245 - 253, DOI: 10.1080/15715124.2010.505895.

17. Obuobie E, Drechsel P, Danso G (2004) Gender in open-space irrigated urban vegetable farming in Accra. *Urban Agriculture Magazine* 12: p13-15.

18. Kessler A, Streiffeler F, Obuobie E (2004) Women in urban agriculture in West Africa. *Urban Agriculture Magazine* 12: p16-17.

19. Obuobie E, Danso G, Drechsel P (2003) Access to land and water for urban vegetable farming in Accra. *Urban Agriculture Magazine* 11: p15-17.

B. REFEREED BOOKS

1. Obuobie, E. (2008). Estimation of groundwater recharge in the context of future climate change in the White Volta River Basin, West Africa. *Ecology and Development Series*. No. 62, University of Bonn, Bonn, 168pp.

2. Obuobie, E., Keraita, B., Danso, G., Amoah, P., Cofie, O., Raschid-Sally, L. and Drechsel, P. (2006). *Irrigated Urban Vegetable Production in Ghana: Characteristics, Benefits and Risks*. IWMI-RUAF-CPWF, Accra, Ghana: IWMI, 150pp.

C. REFEREED BOOK CHAPTERS

1. Obuobie, E., Amisigo, B., Logah, F. and Kankam-Yeboah, K. (2017). Analysis of changes in downscaled rainfall and temperature projections in the Volta River Basin - Chapter 8. In: Ntiamoah-Badu, Y., Ampomah, B. Y., and Ofori, E. A. (Eds). *Dams, Development and Downstream Communities: Implications for Re-optimising the Operations of the Akosombo and Kpong Dams in Ghana*. Digi books Gh. Ltd, Tema, Ghana.

2. Obuobie, E., Barry, B. and Agyekum W. (2016). Groundwater Resources of the Volta Basin. In: Williams, T., Mul, M., and Vladimir, S. (eds). *Volta River Basin: Water for food, Economic Growth and Environment*, pp 46-61, London; New York: Routledge.

3. Obuobie, E. and Hope, L. (2014). Characteristics of Urban vegetable farmers and gender issues. In: Drechsel, P. and Keraita, B. (Eds). *Irrigated Urban Vegetable Production in Ghana: Characteristics, benefits, and risks*. Second edition. Colombo, Sri Lanka: International Water Management Institute (IWMI). Pp 28-37, doi:10.5337/2014.219.

4. Obuobie, E., Keraita, B., Hope, L. and Agodzo, S.K. (2014). Health risk perception of stakeholders. In: Drechsel, P. And Keraita, B. (Eds). *Irrigated Urban Vegetable Production in Ghana: Characteristics, benefits, and risks*. Second edition. Colombo, Sri Lanka: International Water Management Institute (IWMI). Pp 116-135, doi:10.5337/2014.219
5. Drechsel, P., Obuobie, E., Adam-Brandford, A., and Cofie, O.O. 2014. Health risk perception of stakeholders. In: Drechsel, P. and Keraita, B. (Eds). *Irrigated Urban Vegetable Production in Ghana: Characteristics, benefits, and risks*. Second edition. Colombo, Sri Lanka: International Water Management Institute (IWMI). Pp 199-218, doi:10.5337/2014.219
6. Danso, G., Drechsel, P., Obuobie, E., Forkuor, G. And Kranjac-Berisavljevic, G. (2014). Urban vegetable farming sites, crops, and cropping practices. In: Drechsel, P. and Keraita, B. (Eds). *Irrigated Urban Vegetable Production in Ghana: Characteristics, benefits, and risks*. Second edition. Colombo, Sri Lanka: International Water Management Institute (IWMI). Pp 7-27, doi:10.5337/2014.219.
7. Obuobie, E and Barry, B. (2012). Ghana. In P. Pavelic, M. Giordano, B. Keraita, T. Rao, and V. Ramesh (Eds.). *Groundwater availability and use in Sub-Saharan Africa: a review of 15 countries*, Ch. 4, pp.43-64. Colombo, Sri Lanka: International Water Management Institute (IWMI), doi: 10.5337/2012.213.
8. Obuobie, E and Barry, B. (2012). Burkina Faso. In P. Pavelic, M. Giordano, B. Keraita, T. Rao, and V. Ramesh (Eds.). *Groundwater availability and use in Sub-Saharan Africa: A review of 15 countries*, Ch. 2, pp.7-24. Colombo, Sri Lanka: International Water Management Institute (IWMI), doi: 10.5337/2012.213.
9. Barry, B and Obuobie, E. (2012). Mali. In P. Pavelic, M. Giordano, B. Keraita, T. Rao, and V. Ramesh (Eds.). *Groundwater availability and use in Sub-Saharan Africa: a review of 15 countries*, Ch. 7, pp.93-109. Colombo, Sri Lanka: International Water Management Institute (IWMI), doi: 10.5337/2012.213.
10. Barry, B and Obuobie, E. (2012). Niger. In P. Pavelic, M. Giordano, B. Keraita, T. Rao, and V. Ramesh (Eds.). *Groundwater availability and use in Sub-Saharan Africa: a review of 15 countries*, Ch. 9, pp.123-137. Colombo, Sri Lanka: International Water Management Institute (IWMI), doi: 10.5337/2012.213.