



Monica Kung'aro
2015 AWARD Fellow

Position	PhD Student
Institution	Nelson Mandela African Institution of Science and Technology (NM-AIST)
Country	Tanzania
MSc	Mathematical Modelling, University of Dar es Salaam, 2011
Mentor	Dr. Hans C. Komakech, Lecturer, Water Environmental Science and Engineering, NM-AIST
Research Area	Mathematical modelling of livestock diseases and their control for better understanding of emerging infections, identification of vulnerabilities, and development of effective control policies.



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Monica Kung'aro grew up in Morogoro, Tanzania in a family of seven children, all of whom have completed university, thanks to the encouragement of their parents. Even as early as primary school she had a knack for mathematics and science, and has translated her gift into work that is helping to support smallholder farmers in her country.

After completing a bachelor's degree in Mathematics in 2007, Kung'aro began working at the University of Dodoma, which she calls her "training ground." She then moved on to a master's in Mathematical Modelling at the University of Dar es Salaam, and is soon to complete her PhD at NM-AIST.

"Mathematical modelling is the process of constructing math equations from theory," she explains. "In other words, we translate theory into equations called models." Her current PhD research involves doing modelling and control of yellow fever in Tanzania.

"Outbreaks of infectious diseases—vector-borne diseases in particular, like malaria, dengue, chikungunya, and yellow fever—have devastated several countries in Africa and around the world," she states. "Thus, modelling their dynamics and control has gained enormous attention."

Yellow fever is considered a minor disease, and Kung'aro is investigating what new findings are being added to existing protocols. The disease exists primarily in the forest canopies of Africa, being spread to humans, monkeys and other primates that get bitten by the *Aedes aegypticus* mosquito. "There is a lot of research being done into malaria, but very little into yellow fever, so I'm trying to fill the gap," she asserts. "In fact, there are very few research papers published on modelling of yellow fever, so I'm doing what I can to add to the body of research."

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AWARD is a career-development program that equips top women agricultural scientists across sub-Saharan Africa to accelerate agricultural gains by strengthening their research and leadership skills through tailored fellowships. AWARD is a catalyst for innovations with high potential to contribute to the prosperity and well-being of African smallholder farmers, most of whom are women.

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Kung’aro is committed to helping smallholder farmers learn how to identify diseases in their livestock. “I hope to find strategies to overcome yellow fever and other diseases, through such means as vaccination as an early intervention strategy,” she notes. “As a researcher, I intend to help smallholder farmers and livestock keepers, specifically women, to be empowered in their activities.”

Kung’aro, a mother of one, knows first-hand the challenge of balancing work and family responsibilities. Once she has completed her doctoral program, she plans to focus her research on helping livestock and poultry keepers in Tanzania. Her aim is to eventually become a professor of applied mathematics, concentrating on modelling and control of diseases in humans and livestock.

She sees the value of the AWARD program and is ready to take advantage of the many benefits it offers. “I think the AWARD program will help me to improve my writing skills and develop confidence, and I look forward to attending a science skills course,” she says. “I have already had the opportunity to network with other AWARD Fellows from across the continent. I plan to grab the chances that come my way, especially in sharing ideas and collaborating with other women I meet as an AWARD Fellow.” Kung’aro plans to be a role model at her institution, sharing the advantages of the program and talking about how AWARD has influenced her behaviors and attitudes.

She is thankful for the support of her husband, parents, classmates and coworkers, who have all helped her to achieve her goals, and she hopes to publish more papers in scientific journals, to add to the two she has already completed.