



2018 AWARD Fellow
Harriet Achiaa Dwamena

Position	Biometrician
Institution	Council for Scientific and Industrial Research (CSIR), Crops Research Institute
Country	Ghana
MPhil	Applied Mathematics, Kwame Nkrumah University of Science and Technology (KNUST), 2016
Mentor	Dr. Francis Amoako-Andoh, Senior Research Scientist, CSIR
Research Area	Providing support to researchers and students on the application of mathematics and statistics in agricultural research.

Dwamena's work involves sampling and designing experiments, analyzing data, and interpreting research results. In 2016, she distinguished herself as the only female student to graduate with a master's in Applied Mathematics at the Kwame Nkrumah University of Science and Technology in Ghana.

Harriet Achiaa Dwamena was not always a mathematics whiz. "In primary school, I really loved science and English but my math was not very good," she recalls. "My best score was 50 percent!" It is only when her class six teacher challenged her about her mathematics scores that her focus shifted—resulting in a marked improvement in her performance. "When my teacher encouraged me, I realized that math is not difficult, it is just about applying the principles," she declares. "I really love math—everything about it," she smiles. It is this love for numbers that led Dwamena to pursue a BSc in Mathematics and explore the possibilities that this specialization offered. "With mathematics, you don't limit yourself to one area, you can take it to health, engineering, or agriculture," she explains. After graduating, Dwamena had an opportunity to apply her mathematics in agricultural research when she was posted to CSIR for her national service.

At CSIR, Dwamena's work involves sampling and designing experiments, analyzing data, and interpreting research results. She also assists in compiling reports and publications to communicate research findings. In 2016, she distinguished herself as the only female student to graduate with a master's in Applied Mathematics at KNUST, Ghana. For her research thesis, Dwamena came up with a time series model of grain yield in maize. "I developed a statistical model for predicting grain yield in a maize case study at the Crops Research Institute," she says. "I collected panel data that is already in the system, analyzed it to look for the shortfalls, and compared it with data reflecting the current situation." Analysis of the two data sets helps researchers understand why crop yields are increasing or

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Dwamena is one of a growing number of women agricultural scientists who have won an AWARD Fellowship. AWARD works toward inclusive, agriculture-driven prosperity for the African continent by strengthening the production and dissemination of more gender-responsive agricultural research and innovation. We invest in scientists, research institutions, and agribusinesses to deliver sustainable, gender-responsive agricultural research and innovation.

The AWARD Fellowship is a career-development program that invests in top women agricultural scientists to ensure that confident, capable, and influential women are available to lead critical advances and innovations in the agricultural sector.

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reducing over a period of time. Dwamena is excited that researchers are already using her findings in their work.

“In Africa, we do not really use modeling to address specific agricultural problems,” laments Dwamena. She is concerned about the mismatch in agricultural investment, as most of it goes to production efforts. “After my master’s, I realized that in Africa, we spend 95 percent on food production but only 5 percent goes to postharvest management.” Her goal is to develop mathematical models to determine appropriate storage conditions for each crop to address postharvest losses. As different crops require different storage conditions, it is important to come up with separate models for each crop. “It worries me that food is wasted,” she says, noting that she would like to ensure that farmers reap maximum benefits from their crops—even when they are not in season—as a result of good postharvest practices.

In the course of her work as a biometrician, Dwamena does not interact with farmers directly, but the models are certainly designed with them in mind. “When researchers apply the models, it will definitely help the farmers,” she states. Dwamena teaches biometrics and statistics at the CSIR College of Science and Technology, teaching postgraduate students how to design experiments and how to collect research data. Furthermore, she is constantly advising students on data analysis, including some from other universities. Dwamena has been involved in two short-term consultancies—evaluating yields in selected cowpea varieties and studying the effect of fertilizer on some yam species. In both projects, her role entailed advising on the design parameters for collecting data and analyzing the results. “Eventually, I hope to set up a consultancy where people will come for advice on modeling on agricultural issues,” says Dwamena, sharing her future plans.

As a mathematician, Dwamena has encountered some unfamiliar agricultural terms and procedures in the course of her work. In such instances, she has consulted agricultural scientists to gain a better understanding of the results she is analyzing. “I plan to go for short courses on the agriculture side to add to my mathematics—so I may be well-versed in both fields,” she says. At CSIR, Dwamena is the first biometrician to participate in the AWARD Fellowship, and she promises to encourage other biometricians to apply. Dwamena is already seeing the benefits of her participation in the fellowship. “At the mentoring orientation workshop, I have learned a lot on conflict management. I am the type that will always be quiet—if something is bothering me, I will not voice it. I now realize that being assertive will really help,” she says. Through AWARD, she is also looking forward to expanding her networks and participating in the proposal writing and scientific skills training, which will be useful in disseminating research findings. “Publishing will help bring visibility to our research,” she asserts. “If we carry out research and do not publish, people will not know what we are doing.”