



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

October 30, 2021



*Borlaug Higher Education for  
Agricultural Research and Development*

## **Final Scholar Report: Malawi**

**By**

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## Executive Summary

**Michigan State University (MSU) is the implementing entity of the Borlaug Higher Education for Agricultural Research and Development (BHEARD) program.** As part of the United States government's Feed the Future initiative, BHEARD is funded by the United States Agency for International Development (USAID), through the International Maize and Wheat Improvement Center (CIMMYT).

Honoring the legacy of Nobel Peace Prize Laureate Norman Borlaug, the program increases the number of agricultural scientists and strengthens scientific institutions in partner countries. BHEARD supports long-term training of agricultural researchers at the master's and doctoral levels, linking scientific and higher education communities in Feed the Future priority countries and the United States.



A BHEARD scholarship supports coursework at U.S. and regional universities in Africa, Brazil, Bangladesh, and India; providing funding for research and post completion research in the student's home country. In addition, the program provides a variety of allowances to cover training costs and laboratory fees. BHEARD also aims to develop, test and evaluate new models of small-scale institutional capacity development. This report documents BHEARD programmatic activities from October 1, 2018 through September 30, 2019. It includes a program overview, financial summaries, and student updates for Malawi.

**Acknowledgement** and thank you to all BHEARD staff who have worked for this program and contributed to this report.

- John Medendorp, Director
- Mathias Ndizihwe, Student Progress Coordinator
- Cait Goddard, Institutional Capacity Development Lead
- Jen Riebow, Fiscal Officer

## Activity Summary

The Borlaug Higher Education for Agriculture and Development (BHEARD) program, supported by US Agency for International Development (USAID) develops agricultural scientists and increases agricultural research capacity in Feed the Future partner countries including Malawi. BHEARD has provided scholarships to students seeking masters and doctorate degrees at US

home countries. The program also developed, tested, and evaluated new models of small-scale institutional capacity development. BHEARD sponsored 43 scholars from Malawi, 38 of whom successfully completed their program and went back to their home institutions after completion of their degree program.

### Successes

The Malawi program was the first of the country programs to use regional universities as the primary source of graduate training. The costs of doing so is significantly less that of US institutions. This was enabled, in part, by fact that a majority of Malawian scholars were seeking Masters degrees rather than PhDs. Although regional universities are strengthening their programs day by day, PhD education in the US is still superior to most regional universities and may be worth the investment. In spite of the use of regional rather than US universities, the publication record and rate for the Malawian graduates is in keeping with the averages of the programs, with US universities holding a publication edge.

### Challenges

5 scholars were withdrawn from BHEARD program for the following reasons:

- Three scholars did not complete within the timeline
- One withdrew for personal reasons

### **LIST OF ALL SCHOLARS**

Here is the list of all Malawian scholars sponsored by the BHEARD program.

NAME (first and last)	SEX	COHORT	STUDENT STATUS	UNIVERSITY	SUBJECT AREA	ACADEMIC LEVEL	GRADUATION YEAR
1. Banda, Owen	M	COHORT 4	COMPLETED	Egerton University	Agriculture Extension	MSc	FY2020
2. Banda, Richard	M	COHORT 4	COMPLETED	Egerton University	Food Science	MSc	FY2019
3. Bulrani Ng'ambi, Margaret	F	COHORT 4	COMPLETED	University of Nairobi	Applied Human Nutrition	MSc	FY2018
4. Dambolachepa, Haswell	M	COHORT 4	COMPLETED	University of Nairobi	Crop protection	MSc	FY2019
5. Dzanjalimodzi Kapesi, Linda	F	COHORT 4	COMPLETED	University of Nairobi	Sociology (Rural Sociology and Community Development)	MA	FY2019
6. Liomba, Chikondi	F	COHORT 4	COMPLETED	University of Nairobi	Food Science and Technology	MSc	FY2019
7. Manyozo, Fred	F	COHORT 4	COMPLETED	University of Nairobi	Horticulture	MSc	FY2020
8. Mdyetseni, Matilda	F	COHORT 4	COMPLETED	University of Nairobi	Crop protection	MSc	FY2020
9. Mngoli, Kitty	F	COHORT 4	COMPLETED	University of Nairobi	Food Safety and Quality	MSc	FY2019
10. Zakeyo, Patrick	M	COHORT 4	COMPLETED	Egerton University	Environmental Sciences	MSc	FY2019
11. Lungu, Edda	F	COHORT 3	COMPLETED	University of Florida	Nutritional Sciences	PhD	FY2020

12. Chilungo, Sarah	F	COHORT 3	COMPLETED	North Carolina State University	Food Sciences	PhD	FY2019
13. Chimbaza, Chimwemwe	F	COHORT 3	COMPLETED	University of Zimbabwe	Water Resources Management	MSc	FY2018
14. Chinula, Thandiwe	F	COHORT 3	COMPLETED	University of Pretoria	Water Resources Management	MSc	FY2019
15. Kambombe, Oscar	M	COHORT 3	COMPLETED	Egerton University	Water Resources and Environmental Management	MSc	FY2018
16. Kandinga, Trencio	M	COHORT 3	COMPLETED	University of Pretoria	Water Resources Management	MSc	FY2019
17. Malunga, Innocent	M	COHORT 3	COMPLETED	Egerton University	Soil Science	MSc	FY2018
18. Mkandawire, Vinjeru	F	COHORT 3	COMPLETED	Egerton University	Agribusiness Management	MSc	FY2019
19. Mlotha, Lusayo	M	COHORT 3	COMPLETED	Egerton University	Agronomy	MSc	FY2018
20. Mphwanthe, Getrude	F	COHORT 3	COMPLETED	Michigan State University	Human Nutrition	PhD	FY2019
21. Mwafulirwa, Samuel	M	COHORT 3	COMPLETED	University of Nairobi	Biotechnology	MSc	FY2018
22. Njombwa, Chunala	M	COHORT 3	COMPLETED	Louisiana State University	Animal Science	PhD	FY2020
23. Nkhata, Smith	M	COHORT 3	COMPLETED	Purdue University	Food Science	PhD	FY2019
24. Nyirenda, Harrington	M	COHORT 3	COMPLETED	University of Pretoria	Environmental Ecology	MSc	FY2018
25. Sichali, Nicholas	M	COHORT 3	COMPLETED	University of Pretoria	Water Resource Management	MSc	FY2019
26. Tsitsi, Alfred	M	COHORT 3	COMPLETED	Egerton University	Agriculture Extension	MSc	FY2020
27. Twaya, Grant	M	COHORT 3	COMPLETED	Egerton University	Agribusiness Management	MSc	FY2019
28. Ziba, Geoffrey	M	COHORT 3	WITHDRAWN	University of Pretoria	Agricultural Economics	MSc	-
29. Jali, Watson	M	COHORT 3	WITHDRAWN	Egerton University	Water Resource and Environmental Engineering	MSc	-
30. Kayira, Godfrey	M	COHORT 3	WITHDRAWN	University of Nairobi	Agronomy	MSc	-
31. Khundi, Fydess	F	COHORT 3	WITHDRAWN	Louisiana State University	Agricultural Economics	PhD	-
32. Mtambo, Knowledge	M	COHORT 3	WITHDRAWN	Egerton University	Agribusiness Management	MSc	-
33. Bandason, Elizabeth	F	COHORT 2	COMPLETED	Michigan State University	Entomology	PhD	FY2018
34. Chimera, Elizabeth	F	COHORT 2	COMPLETED	University of Pretoria	Veterinary Epidemiology	MSc	FY2017
35. Kadokera, Doshanie	M	COHORT 2	COMPLETED	University of Pretoria	Agricultural Economics	MSc	FY2018
36. Kawonga, Bettie	F	COHORT 2	COMPLETED	University of Kentucky	Animal and Food Sciences	PhD	FY2019

37. Kumwenda, Wezzie	F	COHORT 2	COMPLETED	University of Pretoria	Applied Human Nutrition	MSc	FY2017
38. Makumba, Albert	M	COHORT 2	COMPLETED	University of Pretoria	Agronomy	MSc	FY2017
39. Mandoloma, Lessah	F	COHORT 2	COMPLETED	Egerton University	Natural Resources	MSc	FY2017
40. Manduwa, Daniel	M	COHORT 2	COMPLETED	University of Pretoria	Horticulture	MSc	FY2018
41. Munthali, Justice	M	COHORT 2	COMPLETED	University of Pretoria	Nutrition	MSc	FY2017
42. Simwaka, Pacsu	M	COHORT 2	COMPLETED	University of Pretoria	Agronomy	MSc	FY2017
43. Siyame, Edwin	M	COHORT 2	COMPLETED	North Carolina State University	Nutrition	PhD	FY2019

### PAPER PUBLICATIONS BY SCHOLARS

Below is a list of all publications through September, 2021, the end date of the BHEARD scholars program. In spite of the use of regional universities, the Malawian scholars published at a respectable 1:1 rate.

STUDENT NAME	TITLE	AUTHORS	PUBLISHED IN	PUBLICATION DATE
1. Getrude Mphwanthe	Dietary Association with Glycemic Status Among Adults Clinically Diagnosed with Type 2 Diabetes in Malawi	"Getrude Mphwanthe , Dave Weatherspoon , Wei Li & Lorraine Weatherspoon"	Community Health Nursing	11/04/20
2. Getrude Mphwanthe	Non-Dietary Factors Associated with Glycemic Status among Adults Diagnosed with Type 2 Diabetes Mellitus in Malawi	"Getrude Mphwanthe , Dave Weatherspoon , Alexander Kalimpira & Lorraine Weatherspoon"	Social Work in Public Health	07/07/20
3. Getrude Mphwanthe	Perceived barriers and facilitators to diet and physical activity among adults diagnosed with type 2 diabetes in Malawi	"Getrude Mphwanthe , Marsha Carolan , Dawn Earnesty & Lorraine Weatherspoon"	Global Public Health	08/11/20
4. Alfred Tsitsi	Influence of Selected Factors on Participation of Rural Youth in Agriculture in Balaka District, Malawi	Alfred D. B. Tsitsi, Justus M. Ombati, Stephen W. Maina	Journal of Agricultural Extension Management	06/03/20
5. Pacsu Lukamba Simwaka	Carbon sequestration and selected hydraulic characteristics under conservation agriculture and traditional tillage practices in Malawi	"Pacsu L. Simwaka Eyob H. Tesfamariam Amos R. Ngwira Paxie W. Chirwa"	Soil Research Journal	10/01/20
6. Banda, Owen	Influence of Selected Institutional and Technological Factors on the Adoption of Sustainable Agriculture Technologies in Maize Farming in Mzimba South, Malawi	Owen Austin Banda, Maurice Ongalo Udoto and Joel Kipkemoi Ng'eno	Journal of Agriculture and Crops	03/12/20

7. Banda, Owen	INFLUENCE OF SELECTED SOCIO-ECONOMIC FACTORS ON THE ADOPTION OF SUSTAINABLE AGRICULTURE TECHNOLOGIES IN MAIZE FARMING IN MZIMBA SOUTH, MALAWI	Owen Austin Banda, Maurice Ongalo Udoto and Joel Kipkemoi Ng'eno	International Journal of Agriculture and Environmental Research	04/28/20
8. Bandason, Elizabeth	Modeling Potential Impacts of Future Climate Change in Mzimba District, Malawi, 2040-2070	Arthur Chibwana Gama, Lawrence D. Mapemba, Patricia Masikat, Sabine Homann-Kee Tui, Olivier Crespo, and Elizabeth Bandason	International Food Policy Research Institute	09/01/14
9. Chilungo, Sarah	Effect of processing and oil type on carotene bio accessibility in traditional foods prepared with flour and puree from orange-fleshed sweet potatoes	Sarah Chilungo, Tawanda Muzhingi, Van-Den Truong, & Jonathan C. Allen	International Journal of Food Science and Technology	12/30/18
10. Kambombe, Oscar	Evidence of Hydrological Extremes Primarily Driven by Human Land Use Changes in Tropical African Basins	Vincent Odongo, Oscar Kambombe, Benedict Mutua, Pieter van Oel, Risper Ajwang, Nzula Kitaka	Geophysical Research Abstracts	
11. Kambombe, Oscar	Impact of climate variability and land use change on streamflow in lake Chilwa basin, Malawi	Oscar Kambombe, Vincent Odongo, Benedict Mutua, and Raphael Wambua	International Journal of Hydrology	06/11/18
12. Kawonga, Bettie	Assessing and managing intensification in smallholder dairy systems for food and nutrition security in Sub-Saharan Africa	Chagunda, Mizeck G; Mwangwela, Agnes; Mumba, Chisoni; Filomena Dos Anjos; Kawonga, Bettie S	Regional Environmental Change	12/01/16
13. Liomba, Chikondi	Formulation of a Complementary Flour with High Nutrient Density and Micronutrient Content	Chikondi Memory Liomba, Catherine Nkirote Kunyanga and Angela Adhiambo	International Journal of Food and Nutrition Research	02/11/18
14. Liomba, Chikondi	Sensory and Proximate Assessment of Fat Cakes Enriched with Soybean Protein	Chikondi Memory Liomba, Jasper Imungi, George Ooko Abong, and Smith Nkhata	Journal of Advances in Food Science and Technology	03/14/18
15. Malunga, Innocent	Effect of Mineral Nitrogen and Legume Intercrops on Maize (Zea mays L.) Nitrogen Uptake, Nutrient Use Efficiency and Yields in Chitedze and Zomba, Malawi	Malunga, I.; Lelei, L.L.; Makumba, W.	Sustainable Agriculture Research	10/31/17
16. Manduwa, Daniel	Factors Affecting Adoption of Agroforestry and Evergreen Agriculture in Southern Africa	Mwase, Weston; Sefasi, Abel; Njoloma, Joyce; Nyoka, Betserai I; Manduwa, Daniel; Nyaika, Jacinta	Environment and Natural Resources Research	06/01/15
17. Manyozo, Fred	Effectiveness of Evaporating Cooling Technologies to Preserve the Post-Harvest Quality of Tomato	Fred N. Manyozo, Jane Ambuko, Margaret J. Hutchinson, J.F. Kamanula	International Journal of Agronomy and	08/01/18

			Agricultural Research	
18. Mwafulirwa, Samuel	Isolation of Indigenous Glyphosate Degrading Microbes from Selected Agro Ecological Zones of Malawi	Samuel Mwafulirwa, George Obiero, Placid Mpeketula, and Gabriel Aboge	Research Journal of Recent Sciences	12/01/17
19. Nkhata, Smith Gilliard	Assessment of oxygen sequestration on effectiveness of Purdue Improved Crop Storage (PICS) bags in reducing carotenoid degradation during post-harvest storage of two biofortified orange maize genotypes	Smith G. Nkhata, Darwin Ortiz, Dieudonne Baributsa, Bruce Hamaker, Torbert Rocheford, Mario G. Ferruzzi	Journal of Cereal Science	02/26/19
20. Nkhata, Smith Gilliard	Fermentation and germination improve nutritional value of cereals and legumes through activation of endogenous enzymes	Smith G. Nkhata, Emmanuel Ayua, Elijah H. Kamau, Jean-Bosco Shingiro	Food Science and Nutrition	10/16/18
21. Nkhata, Smith Gilliard	Nutritional Changes During Biofortified Maize Fermentation (Steeping) for Ogi Production	Darwin Ortiz, Smith Nkhata, Aimee Buechler, Torbert Rocheford, and Mario G. Ferruzzi	The FASEB Journal	04/01/17
22. Nkhata, Smith Gilliard	Determination of preservative residues and microbial contents of commercial Chinese duck neck meat; Determinación de los residuos de conservantes y el contenido microbiano de la carne comercial de cuello de pato chino	Zaixiang Lou, Md Ramim Tanver Rahman, Jun Zhang, Kou Xingran, Smith Gilliard Nkhata, Zhu Song & Nabil Qaid M. Al-Hajj	CyTA - Journal of Food	02/06/17
23. Nkhata, Smith Gilliard	Quality Attributes of Homemade Tomato Sauce Stored at Different Temperatures	Smith Gilliard Nkhata and Emmanuel Owino Ayua	African Journal of Food Science	03/26/18
24. Nkhata, Smith Gilliard	Sensory and Proximate Assessment of Fat Cakes Enriched with Soybean Protein	Chikondi Memory Liomba, Jasper Imungi, George Ooko Abong, and Smith Nkhata	Journal of Advances in Food Science & Technology	03/14/18
25. Nkhata, Smith Gilliard	Limitation of Dietary Lycopene and $\beta$ -Carotene in Prostate and Breast Cancer Chemoprevention Based on Their Mechanisms of Action	Smith G. Nkhata; Emmanuel Ayua	CPQ Cancer	07/31/19
26. Nkhata, Smith Gilliard	Steeping of Biofortified Orange Maize Genotypes for Ogi Production Modifies Pasting Properties and Carotenoid bioavailability	Darwin Ortiz, Smith G. Nkhata, Torbert Rocheford, Mario G. Ferruzzi	Agronomy MDPI	11/18/19
27. Nyirenda, Harrington	Achieving sustainable agricultural production under farmer conditions in maize-gliricidia intercropping in Salima District, central Malawi	Harrington Nyirenda	Heliyon	10/08/19

28. Nyirenda, Harrington	The effect of land use change and management on the vegetation characteristics and termite distribution in Malawian Miombo woodland agroecosystem	"Harrington Nyirenda, Eméline P. S. Assédé, Paxie W. Chirwa, Coert Geldenhuys, Francis W. Nsubuga"	Agroforestry Systems	02/07/19
29. Nyirenda, Harrington	The Effect of Land Use Change and Management on the Vegetation Characteristics and Termite Distribution in Malawian Miombo Woodland Agroecosystem	Harrington Nyirenda, Emeline P.S. Assede, Paxie W. Chirwa, Coert Geldenhuys, Francis W. Nsubuga	Agroforestry Systems	01/22/19
30. Nyirenda, Harrington	Soil Nutrient and Maize Yield Assessment in Maize-Gliricidia Intercrop Fields in Salima District, Central Malawi (Post-Completion Grant Research)	Harrington Nyirenda		03/05/19
31. Siyame, Edwin	Glycemic responses to maize flour stiff porridges prepared using local recipes in Malawi	Mlotha, V., Mwangwela, A.M., Kasapila, W., Siyame, E.W.P., Masamba, K.	Food Science and Nutrition	03/01/16
32. Siyame, Edwin	Iodine source apportionment in the Malawian diet	Watts, M.J., Joy, E.J.M., Young, S.D., Broadley, M.R., Chilimba, A.D.C., Gibson, R.S., Siyame, E.W.P., Kalimbara, A.A., Chilima, B., Ander, E.L.	Nature Publishing Group	10/27/15
33. Siyame, Edwin	Dietary iron intakes based on food composition data may underestimate the contribution of potentially exchangeable contaminant iron from soil	Gibson, R.S.r, Wawer, A.A., Fairweather-Tait, S.J., Hurst, R., Young, S.D., Broadley, M.R., Chilimba, A.D.C., Ander, E.L., Watts, M.J., Kalimbara, A., Bailey, K.B., Siyame, E.W.P.	Academic Press Inc	06/01/15
34. Siyame, Edwin	Preliminary Understanding of Hypertensive Clinics and Hypertensive Patients Attending Hypertensive Clinics in Malawi	Edwin WP Siyame, L. Suzanne Goodell, and Jonathan C. Allen	The FASEB Journal	04/01/16
35. Twaya, Grant	Effect of participation in farmer based organisations on profitability of pigeon pea (cajanus cajan) enterprise in mulanje district, Malawi	Grant White Twaya, Professor Patience Mshenga, Professor Joseph Dzanja	Egerton University	2018
36. Zakeyo, Patrick	The Status, Drivers, and Impacts of Poaching in Lake Chilwa Biosphere Reserve	Patrick Zakeyo, Paul Makenzi, and Marlene Chikuni	International Journal of UNESCO Biosphere Reserves	11/01/18



37. Richard F.D. Banda	Bacterial Biofilm Formation in Milking Equipment in Lilongwe, Malawi	Richard F.D. Banda, John M. Nduko, Joseph W. Matofari	Journal of Food Quality and Hazards Control	08/02/20
38. Richard F.D. Banda	Hygienic Practices and Microbiological quality of Milk of peri-urban Dairy farmers and Bulking centres in Lilongwe, Malawi	Richard F.D. Banda, John M. Nduko, Joseph W. Matofari	Bulletin for Animal Health and Production	03/01/19