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*Borlaug Higher Education for  
Agricultural Research and Development*

## **BHEARD Final Scholar Report**

**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 each of the 11 countries BHEARD has partnered with, as well as examples of student success within this time period.

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

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

# BHEARD Scholars Program

## Final Report

### *Program Overview*

The objectives of the BHEARD program, according to original proposal documents, is to:

- (a) develop scientific capacity (human and institutional) of Feed the Future (FTF) countries;
- (b) create linkages between scientific and higher education communities;
- (c) encourage innovative mechanisms for human and institutional capacity development; and
- (d) create an efficient low-cost implementing entity for United States Agency for International Development (USAID) capacity-building activities.

Of these, objective (a) was the primary focus of BHEARD activities through September 2021, with emphasis on human capacity development. The institutional capacity development was not fully engaged in any intentional or systematic way until 2018, although the program is not without achievements in this area. Since then, there have been extensive efforts to create meaningful linkages between agricultural research and agricultural innovation systems in those countries where the Mission funding was sufficient to support such efforts.

### *Program Participants*

The total number of students participating in the BHEARD program from its inception to September 30, 2021, was 270 total students, of those, 42 have withdrawn or been withdrawn for various reasons (see Table 1). The total completion rate for the program was 80%, with Mali, Kenya, and Uganda boasting the highest completion rate (91%, 90%, and 90%, respectively) and Rwanda and Liberia showing the lowest completion rates (66% and 54%, respectively).

*Table 1: Total Program Participants*

Country	Male	Female	All	Active	Completed	Withdrawn	% Complete
All	181	90	270	0	215	55	80
Bangladesh	20	7	27	0	20	7	74
Cambodia	3	1	4	0	3	1	75
Ghana	26	16	42	0	37	5	88
Kenya	7	3	10	0	9	1	90
Liberia	8	5	13	0	7	6	54
Malawi	26	17	43	0	38	5	88
Mali	17	6	23	0	21	2	91
Mozambique	10	12	22	0	18	4	81
Rwanda	27	14	41	0	28	13	66
South Sudan	29	6	35	0	25	10	71
Uganda	7	3	10	0	9	1	90

The BHEARD scholars program ended on September 30, 2021. All information contained in this

technical report reflects that closing date. The few exceptions (those who graduated after the program closing date) are included below with asterisks.

### *Withdrawn Students*

As can be seen from the program to date totals in Table 2, a total of 55 students have withdrawn from the program since its inception. This is a total of 20% of all students. The reasons for withdrawals are varied, the majority because of failure to complete their academic program requirements within the allotted timeframe, including with the extensions that are allowed by all scholars in accordance to the BHEARD program policy. Others withdrew for personal or health reasons, and others were withdrawn for violation of their contracts.

*Table 2: Program-to-date and FY20 withdrawn*

<b>Withdrawn (PTD)</b>	<b>Male</b>	<b>Female</b>	<b>All</b>
<b>All</b>	32	24	56
<b>Bangladesh</b>	5	2	7
<b>Cambodia</b>	0	1	1
<b>Ghana</b>	1	4	5
<b>Kenya</b>	1	0	1
<b>Liberia</b>	2	4	6
<b>Malawi</b>	4	1	5
<b>Mali</b>	2	0	2
<b>Mozambique</b>	1	3	4
<b>Rwanda</b>	9	5	14
<b>South Sudan</b>	7	3	10
<b>Uganda</b>	0	1	1

### *Publications*

We have tracked scholar publications as a program and will be reporting out on publications during each reporting period. BHEARD students have generated a total of 346 publications during their program periods. In the last fiscal year alone, BHEARD students have generated 14 publications. The number of female publications remains low. We did a thorough review of publications evaluating each publication for originality. We also removed from the list all duplications and all non-academic publications so that the publication numbers would more accurately reflect the original academic scholars are having on the advance of scientific knowledge.

<b>Country</b>	<b>Total Publications</b>	<b>Completing Students</b>	<b>Publications per student (average)</b>
All	364	215	1.7
Bangladesh	58	20	2.9
Cambodia	3	3	1.0

Ghana	86	37	2.3
Kenya	14	9	1.5
Liberia	5	7	0.7
Malawi	38	38	1.0
Mali	36	21	1.7
Mozambique	22	22	0.8
Rwanda	68	27	2.5
South Sudan	16	25	0.6
Uganda	18	9	2.0

*Table 5: Student Publications FY20*

### *Post-Completion Grants*

This FY20 we tracked the data related to Post-Completion Grants approved and completed. As part of the BHEARD program, scholars received a post-completion grant in the amount of \$2000 for Master's scholars and \$3000 for PhD scholars to carry out projects related to their area of study. These proposals were revised and approved by the BHEARD Project Director and they required to include a detailed budget and timelines, to assure they were feasible. There have been 97 post-completion grants approved and completed to the end of the Scholars program.

*Table 6: Student Post-Completion Grants*

<b>PCG (PTD)</b>	<b>Male (PTD)</b>	<b>Female (YTD)</b>	<b>All (YTD)</b>
<b>All</b>	68	29	97
<b>Bangladesh</b>	6	2	8
<b>Cambodia</b>	0	0	0
<b>Ghana</b>	11	4	15
<b>Kenya</b>	4	2	6
<b>Liberia</b>	1	0	1
<b>Malawi</b>	13	12	25
<b>Mali</b>	6	1	7
<b>Mozambique</b>	6	4	10
<b>Rwanda</b>	10	4	14
<b>South Sudan</b>	6	0	6
<b>Uganda</b>	6	0	6

### *Country Reports*

In the following, we give a detailed account of the accomplishments of each of the countries whose missions sponsored scholars as part of the BHEARD program.

## Bangladesh

### 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 Bangladesh. BHEARD has provided scholarships to students seeking masters and doctorate degrees at US and regional academic institutions and has provided funding for agricultural research in their home countries. The program also developed, tested, and evaluated new models of small-scale institutional capacity development.

### Successes

BHEARD sponsored 27 scholars, 20 successfully completed their program and went back to their home institutions after completion of their degree programs. Seven scholars either withdrew (for personal reasons) or were withdrawn due to non compliance with BHEARD regulations. All completing students received PhDs in their respective areas of study

### Challenges

Two scholars from Cohort #6 who were unable to complete their program due to COVID-19 lockdowns in their university, have since the close of the BHEARD program completed their degrees. Their degree completion is marked with an asterisk in the table below.

Seven scholars were withdrawn from the BHEARD program, two for not completing within the timeline, one for disregarding of program requirements, two for violating the sponsorship contract, and two declined scholarships for personal reasons.

### List of All Scholars

NAME (first and last)	SEX	COHORT	STUDENT STATUS	UNIVERSITY	SUBJECT AREA	ACADEMIC LEVEL	GRADUATION YEAR
1. Sheikh, Md Mohiuddin	M	COHORT 6	Completed	Punjab Agricultural University	Extension Education	PhD	-
2. Sultana, Shifat	F	COHORT 6	Completed	Bangladesh Agricultural University	Agricultural Extension Education	PhD	-
3. Talukder, Md Zahirul Alam	M	COHORT 6	Completed	Indian Agricultural Research Institute, New Delhi	Genetics and Plant Breeding	PhD	-
4. Paul, Mritunjoy	M	COHORT 6	Completed <sup>1</sup>	Central Institute of Fisheries Education (CIFE)	Fish Nutrition & Feed Technology	PhD	-
5. Farhad, Md	M	COHORT 6	Completed*	TERI School of Advanced Studies	Molecular plant breeding	PhD	-

6. Datta, Debi Rani	F	COHORT 6	Withdrawn	-	-	PhD	-
7. Kader, Hafij Al	M	COHORT 6	Withdrawn	Indian Agricultural Research Institute, New Delhi	Biochemistry	PhD	-
8. Ray, Shuma	F	COHORT 5	Completed*	Bangabandhu Sheikh Mujibur Rahman Agricultural University	Genetics and Plant Breeding	PhD	-
9. Rahman, Kazi Tamim	M	COHORT 3	Completed	Kansas State University	Agricultural Economics	PhD	FY2020
10. Rahman, MD Mahfuzur	M	COHORT 3	Completed	Washington State University	Plant Pathology	PhD	FY2021
11. Kabir, MD Yamin	M	COHORT 3	Completed	University of Georgia	Horticulture	PhD	FY2020
12. Das, Shimul	M	COHORT 3	Completed	Washington State University	Plant Pathology	PhD	FY2021
13. Dash, Prosanta	M	COHORT 3	Completed	University of Florida	Horticultural Science	PhD	FY2019
14. Hamim, Islam	M	COHORT 3	Completed	University of Hawaii	Tropical Plant Pathology	PhD	FY2019
15. Khan, Murshida	F	COHORT 2	Completed	Louisiana State University	Fisheries and Aquaculture	PhD	FY2019
16. Shamsunnaheer, Shamsunnaheer	F	COHORT 2	Completed	University of Florida	Plant Pathology	PhD	FY2019
17. Akon, MD Wahiduzzaman	M	COHORT 2	Withdrawn	Michigan State University	Entomology	PhD	-
18. Rahman, MD Mokhlesur	M	COHORT 2	Withdrawn	Kansas State University	Genetics	PhD	-
19. Alam, Mohammad Ashraful	M	COHORT 1	Completed	Ohio State University	Fisheries	PhD	FY2018
20. Amin, MD Nurul	M	COHORT 1	Completed	Washington State University	Crop Science	PhD	FY2019
21. Chowdhury, MD Golam Ferdous	M	COHORT 1	Completed	University of Florida	Horticultural Science	PhD	FY2018
22. Elahi, Ferdous E	F	COHORT 1	Completed	Ohio State University	Plant Pathology	PhD	FY2018
23. Islam, MD Mynul	M	COHORT 1	Completed	Ohio State University	Plant Pathology	PhD	FY2018

24. Sattar, Mohammad Nahid	M	COHORT 1	Completed	Michigan State University	Agricultural, Food, and Resource Economics	PhD	FY2019
25. Alam, Mohammad Zahangeer	M	COHORT 1	Withdrawn	Washington State University	Crop and Soil Sciences	PhD	-
26. Arifunnahar, Most Bonita	F	COHORT 1	Withdrawn	North Carolina State University	-	PhD	-
27. Islam, MD Shafiquil	M	COHORT 1	Withdrawn	Michigan State University	Plant Breeding, Genetics and Biotechnology	PhD	-

### Publications by Scholars

The BHEARD scholars sponsored by the USAID mission in Bangladesh had published a total of 58 peer reviewed scientific papers or an average of 2.9 academic papers per BHEARD scholars. These scholars have continued to be active in contributing to the science of their respective fields since the end of the BHEARD program, although the BHEARD program no longer tracked publications after the close of the program on September 30, 2021. These publications are a significant contribution to the advance of agricultural science in Bangladesh and these scholars are continuing and will continue to contribute to scientific agricultural research and knowledge generation for many years to come.

STUDENT NAME	TITLE	AUTHORS	PUBLISHED IN	PUBLICATION DATE
1. Md Nurul Amin	Tuber yield assessment of potato genotypes in Bangladesh	M.N. Amin, M.M. Rahman, Sauda Naznin, M.K. Alam, Md. Monirul Hasan Tipu, Md. Zulfiker Haider, Prodhan, Md. Mazadul Islam and B.C. Kundu	Indian Journal of Agricultural Research	08/31/21
2. Shuma Rani Ray	Heterobeltiosis and Economic Heterosis for Grain Yield Related Traits of Boro Rice ( <i>Oryza sativa</i> L.)	Shuma Rani Ray, A.K.M. Aminul Islam, M.G. Rasul, M.M. Hasan Saikat, J.U. Ahmed	International Journal of Applied Science and Biotechnology	03/30/21
3. Mritunjoy Paul	Effects of graded dietary lipid levels on growth, feed utilization, body composition and metabolism in juvenile white leg shrimp, <i>Penaeus vannamei</i> (Boone, 1931) reared in inland saline water of 10 g/L salinity	Nisha Chuphal, Parimal Sardar, Narottam Prasad Sahu, Naseemashahul Shamna, Vungarala Harikrishna, Manas Kumar Maiti, Vijayakumar Sidramappa Mannur, Prasanta Jana, Mritunjoy Paul, Gopal Krishna	Aquaculture Nutrition	08/08/21
4. Mritunjoy Paul	Dietary protein requirement of white shrimp, <i>Penaeus vannamei</i> (Boone, 1931) juveniles, reared in	Prasanta Jana, Narottam Prasad Sahu, Parimal Sardar, Nazeema Shamna, Tincy Varghese, Ashutosh Dharmendra Deo, Vungarala	Aquaculture Research	12/24/20



	inland ground water of medium salinity	Harikrishna, Mritunjoy Paul, Hougaina Panmei, Gyandeep Gupta, Chinmay Nanda, Gopal Krishna		
5. Mritunjoy Paul	Optimal dietary protein requirement of juvenile GIFT Tilapia ( <i>Oreochromis niloticus</i> ) reared in inland ground saline water	M. Paul, P. Sardar, N.P. Sahu, T. Varghese, N. Shamna, V. Harikrishna, A.D. Deo, P. Jana, K.P. Singha, G. Gupta, M. Kumar and G. Krishna	Journal of Environmental Biology	09/09/21
6. Md Farhad	Phenological variations in early planting of wheat breeding lines and identification of markers by GWAS	"Md Farhad <sup>1</sup> , Shashi Bhushan Tripathi <sup>1</sup> , Ravi Prakash Singh, Arun Kumar Joshi <sup>3</sup> , Pradeep Kumar Bhati, Suchismita Mondal <sup>2</sup> , Uttam Kumar	BGRI Virtual Technical Workshop 2020	10/07/20
7. Md. Farhad	Analysis of early heat tolerance in bread wheat and associated SNP markers	"Md. Farhad, Shashi B. Tripathi, Ravi P. Singh, Arun K. Joshi, Jesse A. Poland, Pradeep K. Bhati, Vipin Tomar, Suchismita Mondal, Uttam Kumar	JTA Multidisciplinary International Conference, New Delhi, India	02/17/20
8. Md. Mohiuddin Sheikh	Integrated Farming Systems: A Review of Farmers Friendly Approaches	Md. Mohiuddin Sheikh, T. S. Riar and A. K. M. Kanak Pervez	Asian Journal of Agricultural Extension, Economics & Sociology	05/11/21
9. Alam, Mohammad Ashraf	A Review on Silonia Silondia (Hamilton, 1822) Threatened Fish of the World: (Siluriformes: Schilbeidae)	Flura, Mohammad Ashraf Alam, and Md. Robiul Awal Hossain	Research in Agriculture, Livestock, and Fisheries	08/30/18
10. Alam, Mohammad Ashraf	Impact of Fifteen Days Fishing Ban in the Major Spawning Grounds of Hilsa ( <i>Tenualosa ilisha</i> Hamilton 1822) on its Spawning Success	Md. Anisur Rahman, Flura, Tayfa Ahmed, Mehedi Hasan Pramanik and Mohammad Ashraf Alam	Research in Agriculture, Livestock, and Fisheries	12/21/15
11. Amin, MD Nurul	Human waste: An underestimated source of nutrient pollution in coastal seas of Bangladesh, India and Pakistan	Amin, Md Nurul; Kroeze, Carolien; Strokal, Maryna	Marine Pollution Bulletin	05/15/17
12. Chowdhury, MD Golam Ferdous	Prestorage application of oxalic acid to alleviate chilling injury in mango fruit	Li, P., Zheng, X., Chowdhury, M.G.F., Cordasco, K., Brecht, J.K.	American Society for Horticulture Science	12/01/15

<b>13.</b> Chowdhury , MD Golam Ferdous	Lipid-Based Edible Coatings Improve Shelf Life and Sensory Quality Without Affecting Ascorbic Acid Content of White Bell Peppers	A.H. Simmone, C.M. Moore, N.R. Green, E.H. Simmone, M.G.F. Chowdhury, J.K. Brecht, R.D. Hagenmaier, F.M. Woods, and R.R. Eitenmiller	Florida State Horitcultural Society	
<b>14.</b> Das, Shimul	Effects of Water, Sanitation, Handwashing, and Nutritional Interventions on Child Enteric Protozoan Infections in Rural Bangladesh: A Cluster-Randomized Controlled Trial	Audrie Lin, Ayse Ercumen, Jade Benjamin-Chung, Benjamin F Arnold, Shimul Das, Rashidul Haque, Sania Ashraf, Sarker M Parvez, Leanne Unicomb, Mahbubur Rahman, Alan E Hubbard, Christine P Stewart, John M Colford Jr., Stephen P Luby	Clinical Infectious Diseases	04/13/18
<b>15.</b> Das, Shimul	Performance of Different Management Practices on Tomato Fruit Borer ( <i>Helicoverpa Armigera</i> Hubner) Abundance and Infestation	M. Dey, S. Das, M. M. Kamal, and R. Sarkar	Journal of the Bangladesh Agricultural University	05/29/17
<b>16.</b> Das, Shimul	Efficacy of Management Approaches Against Cucurbit Fruit Fly ( <i>Bactrocera Cucurbitae</i> Coquillett) of Bitter Gourd	R. Sarkar, S. Das, M.M. Kamal, K.S. Islam, M. Jahan	Bangladesh Journal of Agricultural Research	02/27/18
<b>17.</b> Das, Shimul	Species Richness of Thrips and Whiteflies and Their Predators in Mustard Fields	S. Das, M.M. Rahman, M.M. Kamal, A. Shishir	Journal of the Bangladesh Agricultural University	08/11/17
<b>18.</b> Das, Shimul	Effect of Compost Tea, Streptomycin and Cupravit in Controlling Bacterial Leaf Blight of Rice	A. Shishir, M.M. Kamal, M.A.R. Khokon, M.R. Islam, and S. Das	Bangladesh Journal of Agricultural Research	11/09/17
<b>19.</b> Dash, Prosanta	Yield Performance of Cabbage Under Different Combinations of Manures and Fertilizers	Kumazr Sajib, Prosanta Kumar Dash, Bipradas Adhikary, and Md. Abdul Mannan	World Journal of Agricultural Sciences	
<b>20.</b> Dash, Prosanta	Assessment of Physical Characteristics and Antioxidant Content of Carrot Available in South Western region of Bangladesh	Prosanta Kumar Dash, Afroza Sharmin, and Md. Abdul Mannan	South Asian Journal of Agriculture	08/01/15
<b>21.</b> Dash, Prosanta	Germination, growth and yield response of Kohlrabi, Brassica	Ajay Kumar Biswas; Abdul Mannan; Prosanto Kumar Dash	Bioscience and Bioengineering	03/15/16

	oleracea var. gongylodes L. to NaCl induced salinity stress		Communication s	
<b>22.</b> Dash, Prosanta	A Sustainable Technique of Rapid Multiplication of Gerbera ( <i>Gerbera jamesonii</i> L.) - Using In Vitro Seed Culture	Md. Monirul Islam, M. Abdullah Al Mamun, Prosanta Kumar Dash, Kundu, R.R., and Akter, J.	International Journal of Current Research	08/01/17
<b>23.</b> Dash, Prosanta	A Protocol for Rapid Multiplication of Gerbera jamesonii L. –A popular Cut Flower through Organogenesis	M. M Islam, A. A Mamun, P. K Dash, M. R Islam, and S. Khanam	Journal of Agriculture and Research	08/31/17
<b>24.</b> Dash, Prosanta	An In Vitro Protocol for High Frequency Plant Regeneration from Cotyledonary Nodes of Gerbera Jamesonii L.	M. M Islam, A. A Mamun, P. K Dash, and S. I Jahan	American Journal of Engineering and Natural Sciences	03/01/17
<b>25.</b> Dash, Prosanta	Growth Performance of Orchid ( <i>Dendrobium</i> Sp.) as Influences by Different NPK Spray Connection	Trishita Monda, Prosanta Kumar Dash, Mahtalat Ahmed, Md. Monirul Islam, Md. Hossen Ali	International Journal of Biosciences	04/01/14
<b>26.</b> Dash, Prosanta	Effect of Salinity on Germination, Growth, and Yield of Radish ( <i>Raphanus Sativus</i> L.) Varieties	Paromita Ghosh, Prosanta Kumar Dash, Rituraj Sarker, Md. Abdul Mannan	International Journal of Biosciences	07/02/14
<b>27.</b> Dash, Prosanta	Physico-Chemical Characterization and Product Development from Turmeric ( <i>Curcuma Longa</i> ) Germplasm Available in South Western Region of Bangladesh	Prosanta Kumar Dash, Afroza Akhtar, Md. Abdul Mannan	International Journal of Biosciences	01/11/14
<b>28.</b> Dash, Prosanta	Effect of NPK Spray Foundation on Growth of Two Cultivars of Orchid ( <i>Mokara</i> Sp.)	Md. Hossen Ali, Prosanta Kumar Dash, Md. Monirul Islam, Mahtalat Ahmed, and Trishita Mondal	Journal of Agriculture and Veterinary Science	05/01/14
<b>29.</b> Dash, Prosanta	Physio-Chemical Characteristics and Antioxidant Assay of Tomato ( <i>Lycopersicon Esculentum</i> Mill.) Germplasm Available in the South Western Region of Bangladesh	Md. Mazidul Islam Talukder, Prosanta Kumar Dash, and Md. Abdul Mannan	International Journal of Biosciences	05/08/15

<b>30.</b> Dash, Prosanta	Physio-Chemical Characterization of Drumstick ( <i>Moringa Oleifera</i> L.) Germplasm Available in South Western Region of Bangladesh	Jesmin Akther; Kabir, M.Y.; Dash, P.K.; Mannan, M.A.	Journal of Biodiversity and Environmental Sciences	
<b>31.</b> Dash, Prosanta	Optimization of Heat Stress Mitigation Measures for Strawberry Plug Transplant Establishment	Prosanta K. Dash, Carlene A. Chase, Shinsuke Agehara, Lincoln Zotarelli, and Zhengfei Guan	Florida State Horticultural Society Conference	07/01/17
<b>32.</b> Elahi, Ferdous E.	First report of tomato brown root rot complex caused by <i>Colletotrichum coccodes</i> and <i>Pyrenochaeta lycopersici</i> in Ohio	Vrisman, C.M., Testen, A.L., Elahi, F., Miller, S.A.	American Phytopathological Society	01/01/17
<b>33.</b> Farhad, Md	Biplot yield analysis of heat-tolerant spring wheat genotypes ( <i>Triticum aestivum</i> L.) in multiple growing environments	Akbar Hossain, M.A.H.S. Jahan, Jagadish Timsina, Jaime A. Teixeira da Silva, M. Golam Mahboob, M. Farhad	Open Agriculture	09/06/18
<b>34.</b> Farhad, MD	Development and deployment of biofortified and blast resistant wheat variety in Bangladesh	Md Farhad , Govindan Velu , Ravi Singh , Pawan Singh , Carlos Guzman , Mohammad Abdul Hakim , Mohammad Rezaul Kabir , Mohammad Ashraful Alam , Mohammad Siddikunnabi Mandal , Akbar Hossain , Mostofa Ali Reza , Kishwar-e Mustarin , Abu Hena Sarwar Jahan , Naresh Chandra Deb Barma	13th International Gluten Workshop Proceedings	03/14/18
<b>35.</b> Farhad, MD	Mitigating the twin problems of malnutrition and wheat blast by one wheat variety, 'BARI Gom 33', in Bangladesh	Akbar Hossain, Khondoker Abdul Mottaleb, Md. Farhad, Naresh Chandra Deb Barma	Acta Agrobotanica	07/01/19
<b>36.</b> Farhad, MD	Analysis of early heat tolerance in bread wheat and associated SNP markers	Md. Farhad, Shashi B. Tripathi, Ravi P. Singh, Arun K. Joshi, Jesse A. Poland, Pradeep K. Bhati, Vipin Tomar, Suchismita Mondal, Uttam Kumar	JTA Conference 2020	02/17/20
<b>37.</b> Farhad, MD	Wheat disease surveillance and monitoring in Bangladesh	Md Farhad, Kishwar-E-,Mustarin, Md Mostofa Ali, Reza, Krishna Kanto, Roy, Md. Ashraful, Alam, Md. Rezaul, Kabir, MD Abdil, Hakim, Md Monwar, Hossain, Md Rabiul, Islam, Tim, Krupnik, Md Forhad, Amin, Md.	2018 BGRI Technical Workshop	04/14/18

		Mosharraf, Hossain, Nure Alam, Siddque, Paritosh Kumar, Malaker, Maricellis, Acevedo, Noresh Chandra Deb, Barma		
<b>38.</b> Hamim, Islam	Transgene-Mediated Resistance to Papaya Ringspot Virus: Challenges and Solutions	Hamim, Islam; Green, James C.; Hu, John S.; Marquez, Josiah; Melzer, Michael J.; Borth, Wayne B	Phytoparasitica	02/01/18
<b>39.</b> Hamim, Islam	Correction to: Genome characterization and distribution of Taro bacilliform CH virus on taro in Hawaii, USA	Wang, Yanan; Borth, Wayne B.; Green, James C.; Islam Hamim; Cao, Keqiang; Hu, John S.; Melzer, Michael J.	European Journal of Plant Pathology	02/01/18
<b>40.</b> Hamim, Islam	Genetic diversity of the bacterial wilt pathogen <i>Ralstonia solanacearum</i> using a RAPD marker	Nishat, Sayeda; Hamim, Islam; Ali, Md Ayub; Hossain, Muhammed Ali; Bahadur Meah, M; Islam, Md Rashidul; Ibrahim Khalil, M	Comptes Rendus - Biologies	11/01/15
<b>41.</b> Hamim, Islam	Molecular Characterization and Distribution of Two Strains of Dasheen mosaic virus on Taro in Hawaii	Wang, Yanan; Wu, Beilei; Borth, Wayne B; Islam, Hamim; Green, James C; Melzer, Michael J; Hu, John S	Plant Disease	12/01/17
<b>42.</b> Hamim, Islam	First Report of Dasheen Mosaic Virus Infecting Taro ( <i>Colocasia esculenta</i> ) in Bangladesh	D. Wang, I. Hamim, W. B. Borth, M. J. Melzer, G. F. Sun, and J. S. Hu	Plant disease	10/08/18
<b>43.</b> Hamim, Islam	Genome characterization and distribution of Taro bacilliform CH virus on taro in Hawaii, USA	Yanan Wang, Wayne B. Borth, James C. Green, Islam Hamim, Keqiang Cao, John S. Hu, and Michael J. Melzer	European Journal of Plant Pathology	11/03/17
<b>44.</b> Hamim, Islam	Ultra-sensitive Detection of Papaya Ringspot Virus Using Single-Tube Nested PCR	I. Hamim, W. Borth, M.J. Melzer, J. Hu	Acta Virologica	09/27/18
<b>45.</b> Hamim, Islam	Occurrence of Tomato Leaf Curl Bangladesh Virus and Associated Subviral DNA Molecules in Papaya in Bangladesh: Molecular Detection and Characterization	Islam Hamim, Wayne B. Borth, Michael J. Melzer, Jon Y. Suzuki, Marisa M. Wall, John S. Hu	Archives of Virology	02/15/19
<b>46.</b> Hamim, Islam	First Report of Bean Yellow Mosaic Virus Infecting Nasturtium ( <i>Tropaeolum Majus</i> ) in Hawaii	D. Wang, J. Ocenar, I. Hamim, W. B. Borth, M.T. Fakuda, M.J. Melzer, J.Y. Suzuki, M.M. Wall, T. Matsumoto, G.F. Sun, M. Ko, J.S. Hu	Plant Disease	11/02/18

<b>47.</b> Hamim, Islam	First Report of Zucchini Tigre Mosaic Virus Infecting Bitter Melon ( <i>Momordica Charantia</i> ) in Hawaii	D. Wang, G. Boluk, E. A. Quinto, I. Hamim, W. B. Borth, M. J. Melzer, J. Green, J. Y. Suzuki, M. M. Wall, T. Matsumoto, G. F. Sun, and J. S. Hu	Plant Disease	02/25/19
<b>48.</b> Khan, Murshida	Comparative Study of Physical, Chemical, Microbiological and Sensory Aspects of Some Sun-Dried Fishes in Bangladesh	Bhaskar Chandra Majumdar, Faria Afrin, Md. Golam Rasul, Murshida Khan, and A.K.M. Azad Shah	Brazilian Journal of Biological Sciences	12/31/17
<b>49.</b> Paul, Mritunjoy	Phytobiotics in Aquaculture Health Management: A Review	Prasanta Jana, Sutanu Karmakar, Utsa Roy, Mritunjoy Paul, Ashutosh Kumar Singh, and Kuntal Krishna Bera	Journal of Entomology and Zoology Studies	06/28/18
<b>50.</b> Paul, Mritunjoy	Optimization of Dietary Protein to Energy Ratio (P/E ratio) for Sutchi Catfish, <i>Pangasianodon hypophthalmus</i> (Sauvage, 1878) Fingerlings	Md. Zulfikar Ali, Mritunjoy Paul, Prasanta Jana, Md. Khalilur Rahman and Yahia Mahmud	Journal of Entomology and Zoology Studies	08/19/18
<b>51.</b> Rahman, Kazi Tamim	Freshwater pond fish farming in Bangladesh: A micro level land use analysis	Md Salauddin Palash, Kazi Tamim Rahman, Shakila Salam, and Mahmuda Nasrin	Journal of Bangladesh Agricultural University	08/23/18
<b>52.</b> Rahman, Kazi Tamim	Fed Cattle Market Integration in Mandatory Price Reporting Era	Kazi Tamim Rahman and Md. Salauddin Palash	Open Agriculture	10/05/18
<b>53.</b> Rahman, Kazi Tamim	Profitability and Technical Efficiency of Boro Rice (BRRI dhan29) Cultivation in Dinajpur and Bogra of Bangladesh	Kazi Tamim Rahman, Md. Rafiul Bari, and M. Kamruzzaman	International Journal of Natural and Social Sciences	05/11/16
<b>54.</b> Rahman, MD Mokhlesur	The effect of urban and rural habitats on activity budgets of the endangered Northern Plains sacred langur, <i>Semnopithecus entellus</i> (Dufresne, 1797) in Jessore, Bangladesh	Mst. Tahmina Khatun, Mohammad Firoj Jaman, Md. Mokhlesur Rahman, and Md. Mahabub Alam	Mammalia	01/06/18
<b>55.</b> Ray, Shuma Rani	Role of Exogenous Signaling Molecules in Alleviating Salt-Induced Oxidative Stress in Rice ( <i>Oryza Sativa</i> L.): A Comparative Study	Md. Tahjib-Ul-Arif, Sonya Afrin, Mohammed Arif Sadik Polash, Tahmina Akter, Shuma Rani Ray, Md. Tofazzal Hossain, and M. Afzal Hossain	Acta Physiologiae Plantarum	04/13/19

56. Shamsunna her, Shamsunna her	Reversible Activation of XA21-Mediated Resistance by Temperature	Qiang Chen, Xiaoen Huang, Xiuhua Chen, Shamsunna her, and Wen-Yuan Song	European Journal of Plant Pathology	11/13/18
57. Sheikh, Md Mohiuddin	Effect of Foliar Application of Zinc on the Yield, Quality and Storability of Potato in Tista Meander Floodplain Soil	Md. Waliur Rahman, Md. Monirul Islam, Md. Mohiuddin Sheikh, Md. Iqbal Hossain, Md. Abu Kawochar, and Md. Shamshul Alam	Tropical Agricultural Science	11/14/18
58. Sheikh, Md Mohiuddin	Fuzzy-Likert Scale Based Assessment of Marketing Risk Faced by the Hybrid Rice Growers of Bangladesh	A.K.M. Kanak Pervez, Md. Ektear Uddin, Ashfaq Ahmad Shah, Foyez Ahmed Prodhan, and Md. Mohiuddin Sheikh	Economics of Agriculture	01/18/19

### *Cambodia*

The Cambodian Mission sponsored a total of four students. Three at the PhD level and one at the masters level. Three of the four students completed their programs. One of the students failed their candidacy exams and was not promoted.

### Successes

Three scholars (males) sponsored by BHEARD successfully completed their program. One of the scholars, Dr. Tho Kim Eang, has won several awards for research and innovation and has further funding for his research on plant pathology.

### Challenge

Preparing students who may not have sufficient background to complete rigorous testing requirements was a challenge not only for the Cambodian program, but for other countries as well. An education is a large investment. At universities where candidacies must be successfully sustained or students are withdrawn, it might be worth the extra investment to work with a coach to ensure that the expensive investment of a graduate education is not lost.



Dr. Tho Kim Eang with the Encouragement Award (bronze) of the Asia Innovation Award from the Hitachi Global Foundation.

#### List of all scholars

Name (first, last)	Sex	Cohort	Student Status	University	Subject Area	Academic Level	Graduation year
1. Keo, Socheat	M	Cohort 1	Completed	Michigan State University	Community Sustainability	PhD	FY18
2. Nhim, Tum	M	Cohort 1	Completed	Michigan State University	Community Sustainability	MSc	FY16
3. Tho, Kim Eang	M	Cohort 1	Completed	Michigan State University	Sustainability Plant Pathology	PhD	FY19
4. Hour, Thany	F	Cohort 1	Withdrawn	Michigan State University	Community Sustainability	PhD	-

#### List of publications

In addition to completing their academic programs, the Cambodian scholars have published and continue to publish scientific papers in peer reviewed journals. The below table lists the publications completed up to the close of the BHEARD scholar program on September 30, 2021.



STUDENT NAME	TITLE	AUTHORS	PUBLISHED IN	PUBLICATION DATE
1. Keo, Socheat	Impact of Climate Change on Agricultural Production in NorthWest Cambodia	Socheat Keo	Conference on International Research	09/16/15
2. Keo, Socheat	Impact of Farmer Organisations on Food Security: The Case of Rural Cambodia	THENG Vuthy, KEO Socheat, NOU Keosothea, SUM Sreymom and KHIEV Pirom	Cambodian Development Research Institute Working Papers Series	08/01/14
3. Tho, Kim Eang	First Report of Pantoea agglomerans Causing Onion Leaf Blight and Bulb Rot in Michigan	Tho, K. E.; Wiriyaitsomboon, P.; Hausbeck, M.K.	Plant Disease	02/01/15

## *Ghana*

### 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 Ghana. BHEARD has provided scholarships to students seeking masters and doctorate degrees at US and regional academic institutions and has provided funding for agricultural research in their home countries. The program also developed, tested, and evaluated new models of small-scale institutional capacity development. BHEARD sponsored 42 scholars in Ghana and 37 successfully completed their programs and went back to their home institutions after completion of their degree programs or were available for hire. The Ghanaian cohorts were well selected and suffered a relatively low attrition rate.

### Successes

By any measure, the BHEARD Ghana program was a success. The sheer number of scholars (37) as well as the prolific academic activity of these scholars (86 publications), many published in high-ranking journals, demonstrates the effectiveness of this investment. Two areas of study were particularly important for this group of scholars. The extensive publishing in the area of food and nutrition sciences has made a significant contribution to the field. In addition, the graduation of 16 masters students in the area of seed science has made a significant contribution to the USAID country strategy as well as supported the national strategy of a strengthened seed sector.

### Challenges

Out of 42 scholars, 5 were withdrawn from the program due to Personal health reason (1), Failed candidacy (2), declined scholarship (1) and violation of CoS contract (1). In addition, there were significant delays for students studying at Ghanaian institutions. Most of these delays were caused by bureaucratic processes, and many due to the restrictions of COVID. Nevertheless, the lengthy process of getting theses reviewed and approved lent unnecessary

delays to student progress and cost the BHEARD program significant sums in support costs for these students while they waited for their degree completion. Toward the end of the program, BHEARD began sending students home to await their thesis review rather than continuing to pay support costs for them to remain in country.

### List of All Scholars

Below is a list of all Ghanaian scholars, together with their status, institution, subject area, degree, and year of graduation.

NAME (first and last)	SEX	COHORT	STUDENT STATUS	UNIVERSITY	SUBJECT AREA	ACADEMIC LEVEL	GRADUATION YEAR
1. Abogoom, Jennifer	F	COHORT 6	COMPLETED	KNUST	Seed science and Technology, Seed business and Seed Systems	MPhil	FY2021
2. Adjei-Baiden, Deborah	F	COHORT 6	COMPLETED	KNUST	Seed science and Technology,	MPhil	FY2021
3. Adu-Mensah, Jemima	F	COHORT 6	COMPLETED	KNUST	Seed science and Technology, Seed business and Seed Systems	MPhil	FY2021
4. Adu-Poku, Richard	M	COHORT 6	COMPLETED	KNUST	Seed science and Technology	MPhil	FY2021
5. Mantey, Gerald	M	COHORT 6	COMPLETED	KNUST	Seed science and Technology, Seed business and Seed Systems	MPhil	FY2021
6. Nyam, Clement	M	COHORT 6	COMPLETED	KNUST	Seed science and Technology, Seed business and Seed Systems	MPhil	FY2021
7. Ofori, Constance	F	COHORT 6	COMPLETED	KNUST	Seed science and Technology, Seed business and Seed Systems	MPhil	FY2021
8. Penni, Fidelis	M	COHORT 6	COMPLETED	KNUST	Seed science and Technology, Seed business and Seed Systems	MPhil	FY2021
9. Puzer, Raymond	M	COHORT 6	COMPLETED	KNUST	Seed science and Technology, Seed business and Seed Systems	MPhil	FY2021
10. Yeboah-Manson, Clifford	M	COHORT 6	COMPLETED*	KNUST	Seed science and Technology, Seed business and Seed Systems	MPhil	FY2021
11. Adaku, Abigail	M	COHORT 5	COMPLETED	Kansas State University	Agriculture Economics	PhD	FY2020
12. Appiah, Francis	M	COHORT 5	COMPLETED	KNUST	Seed science and Technology	MPhil	FY2020
13. Coffie, Linda	F	COHORT 5	COMPLETED	KNUST	Seed science and Technology	MPhil	FY2020
14. Obeng-Boateng, Priscilla	F	COHORT 5	COMPLETED	KNUST	Seed science and Technology	MPhil	FY2020
15. Razak, Abdul Salam	M	COHORT 5	COMPLETED	KNUST	Seed science and Technology	MPhil	FY2020
16. Yeboah, Caleb	M	COHORT 5	COMPLETED	KNUST	Seed science and Technology	MPhil	FY2020
17. Ziyaaba, Jonah	M	COHORT 5	COMPLETED	KNUST	Seed science and Technology	MPhil	FY2020

18. Kwarteng, Albert	M	COHORT 5	Declined scholarship	-	Seed science and Technology	MPhil	-
19. Agbemaflle, Isaac	M	COHORT 4	COMPLETED	IOWA STATE UNIVERSITY	NUTRITIONAL SCIENCES	PhD	FY2020
20. Owusu Danquah, Eric	M	COHORT 4	COMPLETED	Michigan State University	Crop and Soil Sciences	PhD	FY2020
21. Acheampong, Samuel	M	COHORT 4	FAILED CANDIDACY	North Carolina State University	Horticulture Sciences	PhD	-
22. Dzandu, Bennett	M	COHORT 3	COMPLETED	Louisiana State University	Food Sciences	PhD	FY2019
23. Yeboah, Simon	M	COHORT 3	COMPLETED	University of Florida	Entomology	PhD	FY2020
24. Akley, Korbla Edwin	M	COHORT 3	COMPLETED	Kansas State University	Agronomy	PhD	FY2019
25. Martey, Edward	M	COHORT 3	COMPLETED	University of Illinois, Urbana-Champaign	Agricultural and Applied Economics	PhD	FY2019
26. Tandoh, Marina	F	COHORT 3	COMPLETED	University of Georgia	Foods and Nutrition	PhD	FY2019
27. Yahaya, Damba	M	COHORT 3	COMPLETED	Tennessee State University	Biological Sciences	PhD	FY2019
28. Lekete, Emmanuella	F	COHORT 3	WITHDRAWN	University of Georgia	Plant Pathology	PhD	-
29. Adjepong, Mary	F	COHORT 2	COMPLETED	Michigan State University	Human Nutrition	PhD	FY2018
30. Antwi, Kwaku Dei	M	COHORT 2	COMPLETED	Texas Tech University	Agricultural Economics	PhD	FY2018
31. Enninful, Regina	F	COHORT 2	COMPLETED	Kansas State University	Agronomy	PhD	FY2019
32. Kubuga, Clement	M	COHORT 2	COMPLETED	Michigan State University	Human Nutrition	PhD	FY2018
33. Kyereh, Emmanuel	M	COHORT 2	COMPLETED	Louisiana State University	Food Science	PhD	FY2018
34. Pepra-Ameyaw, Nana	M	COHORT 2	COMPLETED	Michigan State University	Food Science	PhD	FY2018
35. Sienso, Gifty	F	COHORT 2	COMPLETED	Texas Tech University	Agricultural and Applied Economics	PhD	FY2019
36. Tengey, Theophilus	M	COHORT 2	COMPLETED	Texas Tech University	Plant and Soil Science	PhD	FY2018

37. Akley, Korbla Edwin	M	COHORT 1	COMPLETED	Kansas State University	Agronomy	MSc	FY2019
38. Darko, Clara Bernice	F	COHORT 1	COMPLETED	Virginia Tech	Biological Systems Engineering	PhD	FY2017
39. Haruna, Bashiru	M	COHORT 1	COMPLETED	Ohio State University	Agricultural, Environmental, and Development Economics	MSc	FY2016
40. Hayford (Adjei-Frimpong), Princess	F	COHORT 1	COMPLETED	Michigan State University	Crop and Soil Sciences	PhD	FY2018
41. Dzikushi, Esther	F	COHORT 1	WITHDRAWN	Michigan State University	-	PhD	-
42. Karikari, Afia Serwaa	F	COHORT 1	WITHDRAWN	University of Georgia	Plant Breeding, Genetics and Genomics	PhD	-

### Paper Publications by Scholars

Ghanaian scholars were singular by virtue of their extensive publishing record. Although the number of scholars was high, the number of publications per scholar was also high compared to other country cohorts (2.3).

STUDENT NAME	TITLE	AUTHORS	PUBLISHED IN	PUBLICATION DATE
1. Regina Enniful	Water-deficit stress alters intra-panicle grain number in sorghum	"Regina Enniful Adotey Andres Patrignani Blake Bergkamp Gerard Kluitenberg P.V. Vara Prasad S. V. Krishna Jagadish"	Crop Science	06/12/21
2. Abogoom, Jennifer	Core Collection of Two Important Indigenous Vegetables; Gboma Eggplant ( <i>Solanum Macrocarpon</i> L.) and Jute Mallow Exploitation of Existing Germplasm and Development of Improved Cultivars	Kwarteng, Albert Owusu; Amoah, Richard Adu; Nyadanu, Daniel; Nyam, Clement Kwarteng; Ziyaaba, Jonah Zubil; Abogoom, Jenniffer; Aziz, Aisha; Anokye, Kenneth Darko; Dufie, Mary; Boakye, Mercy Osei; Danso, Emmanuella Opoku	Australian Journal of Crop Science	09/01/18
3. Abogoom, Jennifer	Phenomic characterization of twenty-four accessions of spider plant ( <i>Cleome gynandra</i> L.) the Upper East region of Ghana	A. O. Kwarteng, J. Abogoom, R. Adu Amoah, D. Nyadanu, C. K. Nyam, T. Ghunney, E. Awuah, J. Z. Ziyaaba, J. O. Ogunsanya, E. E. Orhin and D. D. Asiedu	Scientia Horticulturae	03/07/18

4. Abogoom, Jennifer	Current knowledge and breeding perspectives for the spider plant ( <i>Cleome gynandra</i> L.): a potential for enhanced breeding of the plant in Africa	A. O. Kwarteng, J. Abogoom, R. Adu Amoah, D. Nyadanu, T. Ghunney, C. K. Nyam, J. Z. Ziyaaba, E. O. Danso, D. D. Asiedu and T. Whyte	Genetic Resources and Crop Evolution	03/22/18
5. Adjepong, Mary	Quantification of fatty acid and mineral levels of selected seeds, nuts, and oils in Northern Ghana	Adjepong, M., Jain, R., Pickens, C.A., Appaw, W., Fenton, J.I.	Journal of Food Science and Technology	11/01/18
6. Adjepong, Mary	Association of whole blood fatty acids and growth in southern Ghanaian children 2–6 years of age	Adjepong, M., Yakah, W., Harris, W.S., Colecraft, E., Marquis, G.S., Fenton, J.I.	Nutrients; Basel	08/01/18
7. Adjepong, Mary	Whole blood n-3 fatty acids are associated with executive function in 2–6-year-old Northern Ghanaian children	Adjepong, M., Yakah, W., Harris, W.S., Annan, R.A., Pontifex, M.B., Fenton, J.I.	Journal of Nutritional Biochemistry	04/04/18
8. Adjepong, Mary	Association of whole blood n-6 fatty acids with stunting in 2-to-6-year-old Northern Ghanaian children: A cross-sectional study	Adjepong, M., Austin Pickens, C., Jain, R., Harris, W.S., Annan, R.A., Fenton, J.I.	PLOS One	03/01/18
9. Adjepong, Mary	Quantification of fatty acid and mineral levels of selected seeds, nuts, and oils in Ghana	Adjepong, M., Valentini, K., Pickens, C.A., Li, W., Appaw, W., Fenton, J.	Journal of Food Composition and Analysis	02/14/17
10. Adjepong, Mary	Evaluation of fatty acid and mineral content of Tanzanian seeds and oils	Jumbe, T.J., Pickens, C.A., Valentini, K., Adjepong, M., Li, W., Kinabo, J.L., Fenton, J.I.	Journal of Food Composition and Analysis	07/01/16
11. Adjepong, Mary	The Role of Antioxidant Micro nutrients in the Rate of Recovery of Burn Patients: A Systematic Review	Mary Adjepong, Pius Agbenorku, Patricia Brown, and Ibok Oduro	Burns & Trauma	08/03/16
12. Adjepong, Mary	The Effect of Dietary Intake of Antioxidant Micronutrients on Burn Wound Healing: A Study in a Tertiary Health Institution in a Developing Country	Mary Adjepong, Pius Agbenorku, Patricia Brown, and Ibok Oduro	Burns & Trauma	08/12/15

13. Adjepong, Mary	Whole Blood Saturated Fatty Acids are Negatively Associated with Executive Function in 2 to 6-Year-Old Ghanaian Children	William Yakah, Mary Adjepong, Reginald Annan, Mathew Pontifex, and Jenifer Fenton	The FASEB Journal	04/01/17
14. Adjepong, Mary	Characterization of Fatty Acid and Mineral Composition of Selected Seeds, Nuts and Oils in Northern Ghana	Raghav Jain, Mary Adjepong, William Appaw, Jenifer Fenton, and Charles Austin Pickens	The FASEB Journal	04/01/17
15. Adjepong, Mary	Fatty Acids and Desaturase Enzyme Estimates are Associated with Growth Stunting in 2-to-6-Year-Old Northern Ghanaian Children: A Cross-Sectional Study	Mary Adjepong, William Yakah, Raghav Jain, William Harris, Reginald Adjetey Annan, and Jenifer Fenton	The FASEB Journal	04/01/17
16. Adjepong, Mary	Characterization of Fatty Acid and Mineral Composition of Selected Seeds, Nuts and Oils in Tanzania	Kelly Valentini, Theresia Jumbe, Austin Pickens, Mary Adjepong, Wei Li, Joyce Kinabo, and Jenifer Fenton	The FASEB Journal	04/01/16
17. Agbemaflle, Isaac	Nutritional Status of Children 0-59 months in Selected Intervention Communities in Northern Ghana from the Africa Rising Project in 2012	Mary Glover-Amengor, Isaac Agbemaflle, Lynda Larmkie Hagan, Frank Peget Mboom, Gladys Gamor, Asamoah Larbi, and Armgard Hoeschle-Zeledon	Archives of Public Health	04/04/16
18. Agbemaflle, Isaac	Effects of Parents Training on Parents' Knowledge and Attitudes about Adolescent Sexuality in Accra Metropolis, Ghana	Elizabeth Aku Baku, Isaac Agbemaflle, and Richard M.K. Adanu	Biomed Central Ltd.	08/24/17
19. Agbemaflle, Isaac	Anemia Prevalence and Nutrient Intake Among Women in Peri-Urban Settlements in Accra, Ghana	Agbemaflle, I., Steiner-Asiedu, M., Saalia, F.K., Setorglo, J., Chen, J., and Philips, R.D.	African Journal of Food, Agriculture, Nutrition and Development	11/01/16
20. Agbemaflle, Isaac	Assessing the Ownership, Usage, and Knowledge of Insecticide Treated Nets (ITNs) in Malaria Prevention	Nyavor, K.D., Kweku, M., Agbemaflle, I., Takramah, W., Norman, I., Tarkang, E., Binka, F.	The Pan African Medical Journal	09/22/17

	in the Hohoe Municipality, Ghana			
21. Agbemaflle, Isaac	Risk Factors Associated with Hypertension among Adults in the Hohoe Municipality, Ghana	Sedoafia Amelor, Margaret Kweku, Eric Agboli, Isaac Agbemaflle, Wisdom Takramah, Elvis Tarkang, Wisdom Kudzo Axame, Prince Kubi Appiah, and Fred Newton Binka	Journal of Advances in Medicine and Medical Research	10/18/16
22. Agbemaflle, Isaac	Ownership and Utilization of Long Lasting Insecticide Treated Nets (LLIN) and Factors Associated to Non-Utilization Among Pregnant Women in the Ho Municipality of Ghana	Wisdom Kudzo Axame, Margaret Kweku, Sedoafia Amelor, Gideon Kye-Duodu, Eric Agboli, Isaac Agbemaflle, Wisdom Takramah, Elvis Tarkang, Fred Newton Binka	Central African Journal of Public Health	10/14/16
23. Agbemaflle, Isaac	"Urine Creatinine and Anthropometric Indices of Sportsmen and Women"	Matilda Steiner-Asiedu, Juliet Vickar, Frederick Vuvor, Isaac Agbemaflle, Yusif M. Tahiru	Biomedical and Biotechnology Research Journal	10/01/17
24. Agbemaflle, Isaac	Prevalence and Awareness of Hypertension and Pre-Hypertension Among Traders in Hohoe Municipality, Ghana	Fafali BANI, Peace NYAVOR, Isaac AGBEMAFLE, Wisdom TAKRAMAH, Eric AGBOLI, Elvis TARKANG, Mohammed TAKASE and Margaret KWEKU	Journal of Scientific Research and Studies	01/25/17
25. Akley, Korbla Edwin	Carbon saturation and translocation in a no-till soil under organic amendments	"Nicoloso, Rodrigo S. Rice, Charles W. Amado, Telmo J.C. Costa, Claudia N. Akley, Edwin K."	Agriculture, Ecosystems & Environment	09/01/18
26. Akley, Korbla Edwin	Impact of Direct Seeding Mulch-Based Cropping Systems on Soil Health in the Guinea Savanna Zone of Ghana	Edwin K. Akley, Charles W. Rice, Benjamin D.K. Ahiabor, Wilson Dogbe and Michael Mawunya	SSA-CSA-Ass International Meeting	11/16/15
27. Antwi, Kwaku Dei	Analysis of Food Security among Cocoa Producing Households in Ghana	Kwaku Dei Antwi, Conrad Power Lyford	Journal of Agriculture and Sustainability	05/01/18
28. Antwi, Kwaku Dei	Socioeconomic Determinants of Rain-fed Rice Production among Small-scale Farmers in the	Kwaku Dei Antwi	Asian Journal of Agricultural Extension,	

	Shama-Ahanta East District of Ghana		Economics & Sociology	
29. Antwi, Kwaku Dei	Optimal Resource Allocation Decision Among Women Farmers in the Northern Region of Ghana	Kwaku Dei Antwi	African Journal of Agriculture and Food Security	02/04/16
30. Dzandu, Bennett	Micro-encapsulation of Ginger ( <i>Zingiber officinale</i> ) Extract by Spray Drying Technology	Simon-Brown, K., Solval, K.M., Chotiko, A., Alfaro, L., Reyes, V., Liu, C., Dzandu, B., Kyereh, E., Goldson Barnaby, A., Thompson, I., Xu, Z., Sathivel, S.	LWT- Food Science and Technology	07/01/16
31. Dzandu, Bennett	Application of Water-Soluble Chitosan to Shrimp for Quality Retention	Chouljenko, A., Chotiko, A., Reyes, V., Alfaro, L., Liu, C., Dzandu, B., Sathivel, S.	LWT- Food Science and Technology	12/01/16
32. Dzandu, Bennett	Influence of Milling Intensity and Storage Temperature on the Quality of Catahoula Rice ( <i>Oryza sativa</i> L.)	Ahmad, U., Alfaro, L., Yeboah-Awudzi, M., Kyereh, E., Dzandu, B., Bonilla, F., Chouljenko, A., Sathivel, S.	LWT- Food Science and Technology	01/01/17
33. Dzandu, Bennett	Viability of <i>Lactobacillus Plantarum</i> NCIMB 8826 in Fermented Apple Juice Under Simulated Gastric and Intestinal Conditions	Roberts, D., Reyes, V., Bonilla, F., Dzandu, B., Liu, C., Chouljenko, A., Sathivel, S.	LWT- Food Science and Technology	11/01/18
34. Enninful, Regina	An Efficient Modified method for Plant Leaf Lipid Extraction Results in Improved Recovery of Phosphatidic Acid	Shiva, S., Enninful, R., Roth, M.R., Tamura, P., Jagadish, K., Welti, R.	BioMed Central Ltd.	02/13/18
35. Enninful, Regina	Effects of growth medium, a hormone, and stem-cutting maturity and length on sprouting in <i>Moringa oleifera</i> Lam.	C. Antwi-Boasiako & R. Enninful	The Journal of Horticultural Science and Biotechnology	11/07/15
36. Haruna, Bashiru	EFFECTS OF WEATHER-INDEX INSURANCE: THE CASE OF SMALLHOLDER MAIZE FARMERS IN NORTHERN GHANA	Haruna, Bashiru; Sohngen, Brent; Yahaya, Iddrisu; Wiredu, Alexander Nimo	International Journal of Food and Agriculture Economics	07/01/18
37. Hayford, Princess	A Socioeconomic Study of Transition Zone Yam Farmers Addressing	Patricia Pinamang Acheampong, Eric Owusu Danquah, Hashini Galhena	Sustainability	01/29/19



	Constraints and Exploring Opportunities for Integrating Pigeonpea into Yam Cropping Systems	Dissanayake , Princess Hayford and Cholani Weebadde		
38. Kubuga, Clement	PREVALENCE, RISK FACTORS, KNOWLEDGE OF HYPERTENSION AND DIETARY INTAKE OF GHANIAN NURSES IN NORTHERN REGION	Clement Kubuga, Emmanuel Owusu, Jacob Zanu, Kyung Won Lee, and Won Song	The FASEB Journal	04/01/15
39. Kubuga, Clement	Contaminations of Iron and Aluminum through Food Processing in Tamale Metropolis of Northern Ghana	Clement Kubuga, Anthony Ofori, Chris Boateng, and Won Song	The FASEB Journal	04/01/15
40. Kubuga, Clement	The association between dietary diversity score and iron deficiency anemia among reproductive-aged women in Ghana	Clement Kubuga, Kyungwon Lee, Sujin Song, and Won O Song	The FASEB Journal	04/01/16
41. Kubuga, Clement	Container Gardening to Combat Micronutrients Deficiencies in Mothers and Young Children During Dry/Lean Season in Northern Ghana	Clement Kubreziga Kubuga	Journal of Hunger & Environmental Nutrition	09/05/18
42. Kubuga, Clement	Hibiscus Sabdariffa Meal Improves Iron Status of Childbearing Age Women and Prevents Stunting in Their Toddlers in Northern Ghana	Clement Kubreziga Kubuga, Hyokyoung Grace Hong, and Won O. Song	nutrients	01/19/19
43. Kubuga, Clement	Iron Status of Reproductive Age Women in Northern Ghana is Improved by Indigenous Hibiscus Sabdariffa Meal	Clement Kubreziga Kubuga, Sujin Song, Gina Kennedy, Kyung Won Lee, and Won O. Song	The FASEB Journal	04/01/17
44. Kubuga, Clement	Container Gardens to Meet Vegetable Needs During Dry Season for Reproductive Age Women and their Children in Northern Ghana	Clement Kubreziga Kubuga, Sujin Song, Gina Kennedy, Kyung Won Lee, and Won O. Song	The FASEB Journal	04/01/17

45. Kubuga, Clement	Iodine Status of Reproductive Age Women and Their Toddlers in Northern Ghana Improved Through Household Supply of Iodized Salt and Weekly Indigenous Meal Consumption	Clement Kubreziga Kubuga, Abdul-Razak Abizari, and Won O. Song	PLoS One	05/31/19
46. Kyereh, Emmanuel	Microencapsulation of ginger ( <i>Zingiber officinale</i> ) extract by spray drying technology	Simon-Brown, K., Solval, K.M., Chotiko, A., Alfaro, L., Reyes, V., Liu, C., Dzandu, B., Kyereh, E., Goldson Barnaby, A., Thompson, I., Xu, Z., Sathivel, S.	LWT - Food Science and Technology	07/01/16
47. Kyereh, Emmanuel	Influence of milling intensity and storage temperature on the quality of Catahoula rice ( <i>Oryza sativa</i> L.)	Ahmad, U., Alfaro, L., Yeboah-Awudzi, M., Kyereh, E., Dzandu, B., Bonilla, F., Chouljenko, A., Sathivel, S.	LWT - Food Science and Technology	01/01/17
48. Kyereh, Emmanuel	Development of a Combined Osmotic Dehydration and Cryogenic Freezing Process for Minimizing Quality Changes During Freezing with Application to Fruits and Vegetables	Li, J., Chotiko, A., Kyereh, E., Zhang, J., Liu, C., Ortega, V.V.R., Bankston, D., Sathivel, S.	Journal of Food Processing and Preservation	02/01/17
49. Kyereh, Emmanuel	Incorporating flaxseed ( <i>linum usitatissimum</i> ) oil into queso blanco at different stages of the cheese manufacturing process	Gurdian, C., Reyes, V., Kyereh, E., Bonilla, F., Galindo, C., Chouljenko, A., Solval, K.M., Boeneke, C., King, J.M., Sathivel, S.	Journal of Food Processing and Preservation	12/01/17
50. Kyereh, Emmanuel	Effect of bambara groundnut supplementation on the physicochemical properties of rice flour and crackers	Yeboah-Awudzi, M., Lutterodt, H.E., Kyereh, E., Reyes, V., Sathivel, S., Manful, J., King, J.M.	Journal of Food Science and Technology	09/01/18
51. Kyereh, Emmanuel	Obese Prone CD Rates Robustly Ferment Resistant Starch (RS) with No Increased Weight and Fat Accretion	Diana Obanda, Ryan Page, Justin Guice, Emmanuel Kyereh, Anne Raggio, Georgianna Tuuri, Claudia Husseneder, Roy Martin, Brian Marx, Diana Coulon, Rhett Stout, and Michael Keenan	The FASEB Journal	04/01/17
52. Martey, Edward	Establishing the link between market orientation and agricultural	Martey, E., Etwire, P.M., Wiredu, A.N., Ahiabor, B.D.K.	Food Security	06/24/17

	commercialization: Empirical evidence from Northern Ghana			
53. Martey, Edward	Welfare effect of organic fertilizer use in Ghana	Martey, E.	Heliyon	10/03/18
54. Martey, Edward	An assessment of mobile phone-based dissemination of weather and market information in the Upper West Region of Ghana	Etwire, P.M., Buah, S., Ouédraogo, M., Zougmore, R., Partey, S.T., Martey, E., Dayamba, S.D., Bayala, J.	Agriculture & Food Security	04/10/17
55. Martey, Edward	Using the WEAI+ to explore gender equity and agricultural empowerment: Baseline evidence among men and women smallholder farmers in Ghana's Northern Region	Ragsdale, K., Read-Wahidi, M.R., Wei, T., Martey, E., Goldsmith, P.	Journal of Rural Studies	11/01/18
56. Martey, Edward	Impact of Farmer Mentorship Project on Farm Efficiency and Income in Rural Ghana	Martey, Edward; Dogbe, Wilson; Etwire, Prince M; Wiredu, Alexander N	Journal of Agricultural Science	10/01/15
57. Martey, Edward	Tenancy and Energy Choice for Lighting and Cooking: Evidence from Ghana	Edward Martey	Energy Economics	02/12/19
58. Martey, Edward	Assessment of Agro-input Dealers' Willingness to Invest in Legume Inoculants in Northern Ghana	Edward Martey, Benjamin D. K. Ahiabor, S. S. J. Buah, and Francis Kusi	Asian Journal of Agricultural Extension, Economics & Sociology	11/27/15
59. Martey, Edward	Estimating the Effect of Mineral Fertilizer Use on Land Productivity and Income: Evidence from Ghana	Edward Martey, John K.M. Kuwornu, and Joseph Adjebeng-Danquah	Land Use Policy	04/28/19
60. Martey, Edward	Impact of Farmer Mentorship Project on Farm Efficiency and Income in Rural Ghana	Martey, Edward; Dogbe, Wilson; Etwire, Prince M.; Wiredu, Alexander N	Journal of Agricultural Science	09/01/15
61. Martey, Edward	Heterogenous Demand for Quality Soybean in Northern Ghana	Martey, Edward; Goldsmith, Peter D.		06/01/18

62. Martey, Edward	Assessing the Effectiveness of Inter-Regional Trade in Ghana's Soybean Markets	Martey, Edward; Gatti, Nicholas; Goldsmith, Peter D.		06/20/18
63. Nyam, Clement	Core collection of two important indigenous vegetables; Gboma eggplant ( <i>Solanum macrocarpon</i> L.) and Jute mallow ( <i>Corchorus olitorius</i> L.) in Africa: An important step for exploitation of existing germplasm and development of improved cultivars	Kwarteng, Albert Owusu; Amoah, Richard Adu; Nyadanu, Daniel; Nyam, Clement Kwarteng; Ziyaaba, Jonah Zubil; Abogoom, Jennifer; Aziz, Aisha; Anokye, Kenneth Darko; Dufie, Mary; Boakye, Mercy Osei; Danso, Emmanuella Opoku	Australian Journal of Crop Science	09/01/18
64. Owusu Danquah, Eric	A Socioeconomic Study of Transition Zone Yam Farmers Addressing Constraints and Exploring Opportunities for Integrating Pigeonpea into Yam Cropping Systems	Patricia Pinamang Acheampong, Eric Owusu Danquah, Hashini Galhena Dissanayake, Princess Hayford, and Cholani Weebadde	Sustainability	01/29/19
65. Owusu Danquah, Eric	Rubber and Plantain Intercropping: Effects of Different Planting Densities on Soil Characteristics	Erasmus Narteh Tetteh, Akwasi Adutwum Abunyewa, Henry Oppong Tuffour, Joseph Nketiah Berchie, Patricia Pinamang Acheampong, Kwame Twum-Ampofo, Evans Dawoe, Vincent Logah, Olivia Agbenyega, Stella Ama Ennin, Isaac Nunoo, Caleb Melenya, Eric Owusu-Danquah, Victor Rex Barnes, Samuel Tetteh Partey	PLoS One	01/09/19
66. Owusu Danquah, Eric	Assessment of Aquaponics-Based Food Production System Effluents on the Performance of Maize	Frimpong, F.; Amponsah, S.K.; Owusu Danquah, E.; Agyeman, K.; Oteng-Darko, P.; Oppong, C.P.; Berdjour, A.; and Bessah, E.	CSIRSpace	04/27/17
67. Owusu Danquah, Eric	Integrated Soil Nutrient Management Option for Sustainable Yam Production	E.D. Owusu, S.A. Ennin, P.P. Acheampong	Agronomie Africaine	
68. Owusu Danquah, Eric	Sustaining Yam Yields Amidst Climate Threat in the Forest-Savannah Transition Zone of Ghana	Frimpong F., Owusu Danquah E., Ennin S.A., Asumadu H., Aidoo A.K., Maroya N.	BioRxiv	11/19/18

69. Owusu Danquah, Eric	Performance of an Improved Manual Cassava Harvesting Tool as Influenced by Planting Position and Cassava Variety	Shadrack Kwadwo Amponsah, Joseph Nketiah Berchie, Joseph Manu-Aduening, Eric Owusu Danquah, Jonas Osei Adu, Adeline Agyeman, and Enoch Bessah	African Journal of Agricultural Research	01/03/17
70. Pepra-Ameyah, Nana Baah	Effect of Blanching on the Proximate and Sensory Qualities of the Aerial Yam Composite Cookies	Rita Elsie Sanful, Edward Ken Essuman, and Nana Baah Pepra-Ameyah	Caribbean Journal of Food Science and Technology	01/01/2016
71. Sienso, Gifty	Assessing the Factors Affecting Malnutrition in Northern Ghana	Gifty Sienso and Conrad Lyford	Journal of Nutritional Disorders & Therapy	07/05/18
72. Tandoh, Marina	Assessment of the levels of cadmium and lead in soil and vegetable samples from selected dumpsites in the Kumasi Metropolis of Ghana	Twumasi, Peter ; Tandoh, Marina A. ; Borbi, Makafui A. ; Ajoke, Adigun R. ; Owusu-Tenkorang, Emmanuel ; Okoro, Rosaline ; Dumevi, Rexford M.	African Journal of Agricultural Research	05/05/16
73. Tandoh, Marina	Anti-diabetic effect of aqueous fruit extract of <i>Borassus aethiopum</i> (Mart.) in alloxan-induced diabetic rats	Issaka, J., Larbie, C., Tandoh, M.A.	International Journal of Phyto-medicine	
74. Tandoh, Marina	Relation of unsupported and unsupervised exercise with anthropometric and biochemical indices among type 2 diabetic patients	Chikwere, P., Nsiah, K., Tandoh, M.	Turkish Journal of Medical Sciences	07/05/16
75. Tandoh, Marina	Early Infant Feeding and Body Composition in Pre-School Children	Alex K. Anderson, Christina Whitworth and Marina A. Tandoh	International Journal of Pediatrics and Child Health	07/15/16
76. Tandoh, Marina	Prevalence, Risk Factors, and Predictors of Diabetes Related Sexual Dysfunction	Atosona, Ambrose; Larbie, Christopher; Tandoh, Marina A.; Nsiah, Kwabena	British Journal of Medicine and Medical Research	09/18/16
77. Tandoh, Marina	Hyperuricaemia and Other Cardiometabolic Risks among Type 2 Diabetes Patients	Prince Chikwere, Kwabena Nsiah, Marina A. Tandoh	Trends Journal of Sciences Research	12/22/15

78. Tandoh, Marina	The Effect of Dandelion Leaves and Roots on Blood Glucose in Type 2 Diabetic Patients	Iddrisu, Ishawu; Oduro, Ibok; Tandoh, Marina A.	Journal of Nutritional Ecology and Food Research	12/01/16
79. Tandoh, Marina	Borassus Aethiopum Fruit Pulp Extract has Antimicrobial Activity on Selected Clinical Microbial Strains	E. Ayertey, M.A. Tandoh, F.C. Mills-Robertson, D.B. Kumah, C. Larbie, N.P. Aninkorah	Journal of Complement ary and Alternative Medical Research	10/27/18
80. Tandoh, Marina	Helminthiasis Burden and Nutritional Status of Non-Enrolled School-Aged Children in Irrigated Farming Communities in Bongo District, Ghana	Marina A. Tandoh, Matilda Steiner-Asiedu, Joseph Otchere, Linda A. Daisie, MAXwell A. Appawu, and Michael D. Wilson	European Journal of Experimental Biology	5/1/2015
81. Tengey, Theophilus	Employing Peanut Seed Coat Cell Wall Mediated Resistance Against Aspergillus Flavus Infection and Aflatoxin Contamination	Christopher Joseph Cobos, Theophilus K. Tengey, Vimal Kumar Balasubramanian, Lindsay Williams, Hari Kishan Sudini, Rajeev K. Varshney, Hamidou Falalou, Mark D. Burow, and Venugopal Mendu	Plant Gene	08/16/18
82. Yahaya, Damba	Effects of Moisture Deficit on the Yield of Cowpea Genotypes in the Guinea Savannah of Northern Ghana	Damba Yahaya, Nicholas Denwar, and Matthew W. Blair	Agricultural Sciences	04/26/19
83. Yahaya, Damba	Screening Cowpea (Vigna unguiculata (L.) Walp.) Genotypes for Enhanced N <sub>2</sub> Fixation and Water Use Efficiency under Field Conditions in Ghana	Damba Yahaya, Nicholas Denwar, Mustapha Mohammed, Matthew Blair	American Journal of Plant Sciences	04/26/19
84. Yeboah, Simon	Evaluation of the efficacy of a commercial formulation of beauveria bassiana for the control of the invasive fruit fly bactrocera dorsalis (Diptera: Tephritidae)	Marri, D., Gomez, D.A.M.A., Wilson, D.D., Billah, M., Yeboah, S., Osae, M.	Biopesticides International	09/18/16
85. Ziyaaba, Jonah	Core Collection of Two Important Indigenous Vegetables; Gboma Eggplant (Solanum Macrocarpon L.)	Kwarteng, Albert Owusu; Amoah, Richard Adu; Nyadanu, Daniel; Nyam, Clement Kwarteng; Ziyaaba, Jonah Zubil; Abogoom, Jenniffer; Aziz, Aisha;	Australian Journal of Plant Sciences	09/01/18

	and Jute Mallow Exploitation of Existing Germplasm and Development of Improved Cultivars	Anokye, Kenneth Darko; Dufie, Mary; Boakye, Mercy Osei; Danso, Emmanuella Opoku		
86. Agbemaflle, Isaac	Nutritional, Microbial, and Sensory Evaluation of Complementary Foods Made from Blends of Orange-Fleshed Sweet Potato and Edible Insects	Isaac Agbemaflle, Doris Hadzi, Francis K. Amagloh, Francis B. Zotor, Manju B. Reddy	Foods	09/02/20

## *Kenya*

### Activity Summary

BHEARD sponsored 10 Kenyan scholar and 9 successfully completed their program and went back to their home institutions after completion of their degree program.

### Successes

The Kenyan cohorts showed the lowest attrition rate of any of the BHEARD country programs. This low attrition rate provides a better investment and a higher return on funds invested for the Mission. Most of the sponsored scholars studied at nationally ranked programs in the United States, one of them in South Africa, making these scholars unique among the various country cohorts. The scholars were well selected for the program and well prepared.

### Challenges

One PhD scholar failed candidacy and was by obligation terminated by BHEARD.

### List of All Scholars

Below is the list of all Kenyan BHEARD scholars, together with their respective graduation status, institution of study, subject area, degree received, and year of graduation.

NAME (first and last)	SEX	COHORT	STUDENT STATUS	UNIVERSITY	SUBJECT AREA	ACADEMIC LEVEL	GRADUATION YEAR
1. Ithinji, Duncan	M	COHORT 3	COMPLETED	Washington State University	Immunology and Infectious diseases	PhD	FY21
2. Kosgey, Zennah	F	COHORT 3	COMPLETED	University of Minnesota	Plant Pathology	PhD	FY20
3. Macharia, Anthony	M	COHORT 3	COMPLETED	Texas Tech University	Agricultural and Applied Economics	PhD	FY20
4. Otieno, Susan	F	COHORT 3	COMPLETED	Michigan State University	Plant Breeding, Genetics and Biotechnology	PhD	FY20
5. Rono, Patrick	M	COHORT 3	COMPLETED	Texas Tech University	Agricultural and Applied Economics	PhD	FY20

6.	Shibia, Mumina	F	COHORT 3	COMPLETED	Texas Tech University	Agricultural and Applied Economics	PhD	FY20
7.	Magogo, Juma	M	COHORT 3	COMPLETED	Texas Tech University	Agricultural Education and Communications	PhD	FY20
8.	Moturi, Walter	M	COHORT 3	COMPLETED	University of Georgia	Agricultural and Applied Economics	PhD	FY19
9.	Ndungu, Cyrus	M	COHORT 3	WITHDRAWN	University of Minnesota	Applied Plant Science, Plant Breeding / Molecular Genetics	PhD	
10.	Mbaka, Zachary	M	COHORT 4	COMPLETED	University of Pretoria	Natural Sciences	MSc	FY20

### Paper Publications by Scholars

The following is a partial list of the publications generated by the Kenyan scholars. This list was tabulated only through the end of the student program, which closed on September 30, 2021.

STUDENT NAME	TITLE	AUTHORS	PUBLISHED IN	PUBLICATION DATE
1. Juma Riziki Magogo	Spatial Patterns of African Indigenous Vegetables Value Chain Actors: The Case of Narok and Kajiado County, Kenya	"Juma R. Magogo David E. Lawver Mathew T. Baker Boren-Alpizar Amy Cynthia McKenney Agnes O. Nkurumwa"	American Journal of Geographic Information System	09/02/20
2. Kosgey, Zennah	Inheritance of Stem Rust ( <i>Puccinia graminis</i> Pers. F. Sp. <i>Tritici ericks</i> and E. Hen) Resistance in Bread Wheat ( <i>Triticum aestivum</i> L.) Lines to TTKST Race	Zennah Kosgey, James O. Owuoche, Michael A. Okiror, and Peter N. Njau	International Journal of Agronomy and Agricultural Research	10/12/15
3. Kosgey, Zennah	Potential Uses, Perceptions and Policy Issues of Genetically Modified Crops in Africa: A Case Study of Kenya	Kosgey Zennah and Kimani Cyrus	African Journal of Food, Agriculture, Nutrition and Development	01/01/19
4. Kosgey, Zennah Chepkoech	First Report of a 16Srl (Aster Yellows) Group Phytoplasma in Phlox in the United States	Andrew E. Sathoff, Deepak Rajendran, Seth D. Wannemuehler, Katarina Sweeney, Fazal Manan, Zennah C. Kosgey, Lillian H. Garber, and Benham E. Lockhart,	Plant Health Progress	09/06/16
5. Macharia, Anthony	Heterogeneity in Irrigation Technology Impacts: Implication for Adoption	Anthony M. Macharia, Carlos Carpio, and Lilian Kirimi		08/05/18
6. Macharia, Anthony	Effect of Irrigation Technology Adoption on Smallholder Common Bean ( <i>Phaseolus vulgaris</i> ) Productivity in Kenya	Anthony M. Macharia, Carlos Carpio, and Lilian Kirimi		02/02/18



7. Magogo, Juma Riziki	Adoption of African Indigenous Vegetables into Agro-Pastoral Livelihoods for Income and Food Security: Evidence from Kenya	Patience Mlongo Mshenga, Mwanarusi Saidi, Agnes O. Nkurumwa, Juma Riziki Magogo, Shem Ipomai Oradu	Journal of Agribusiness in Developing and Emerging Economies	08/14/15
8. Moturi, Walter Ondicho	Milk Marketing Channel Choices for Enhanced Competitiveness in The Kenya Dairy Supply Chain: A multinomial Logit Approach	Moturi, Walter ; Obare, Gideon ; Kahi, Alexander	International Association of Agricultural Economists	08/09/15
9. Otieno, Susan	Performance of Five Potato Varieties with Regards to Growth and Production of Mini-Tubers Under an Aeroponic System in Central Highlands of Kenya	Miriam W. Mbiyu, Charles Lung'aho, Susan A. Otieno, Moses W. Nyongesa, Margaret N. Muchui, and Judith N. Ogemma	African Journal of Agricultural Research	11/07/17
10. Otieno, Susan	Taking Aqua Shops from Asia to Africa	Susan Otieno, Graham Haylor, and William Savage	Facilitated Advocacy for Sustainable Development	
11. Rono, Patrick Kibet	An Analysis of Demand for Roots and Tubers in Kenya using the Linear Approximation Almost Ideal Demand System (LA-AIDS)	Rono, Patrick Kibet; Rahman, Shaikh; Benaissa Chidmi	Southern Agricultural Economics Association	02/04/17
12. Rono, Patrick Kibet	Determinants of Food Security among Smallholder Farmers in Kenya	Rono, Patrick K; Rahman, Shaikh Mahfuz; Devadoss, Stephen	Southern Agricultural Economics Association	02/02/18
13. Shibia, Mumina Guyo	Consumer Demand for Meat in Kenya: An Examination of the Linear Approximate Almost Ideal Demand System	Mumina Shibia, Shaikh Mahfuz Rahman, and Benaissa Chidmi	Southern Agricultural Economics Association	02/04/17
14. Shibia, Mumina Guyo	An Empirical Evaluation of the Nature and Extent of Livestock Shocks in Sedentary Pastoral Households in Northern Kenya	Mumina Shibia, Shaikh Mahfuz Rahman, and Stephen Devadoss	Southern Agricultural Economics Association	02/02/18

### *Liberia*

During the cohort 3, BHEARD sponsored 13 scholars from Liberia and 7 successfully completed their program and went back to their institutions after completion of their degree program.

### Successes

Of particular note was the contribution that the BHEARD program made to the aquaculture and fisheries sector of Liberia. The three students graduating in this area have all been reincorporated into the government institutions supporting this sector and have already made significant contributions to the development of this sector.

### Challenges

Nearly half (6) scholars from cohort 3 were withdrawn from the BHEARD program for different reasons:

- One scholar declined the scholarship
- Two scholars were found in violation of the CoS contract
- Two scholars did not complete their studies within the timeline
- One scholar for low academic grades.

Liberia was one of the few BHEARD countries that did not require the completion of the GRE for program qualification. Although the majority of the students were admitted to regional universities at a significant savings to the program and the Mission, nevertheless, the waiving of this requirement proved to be detrimental to the program in that it allowed students to enter graduate training without the requisite skills to succeed.

### List of All Scholars

Below is a list of all scholars sponsored by the BHEARD program through the USAID Mission in Liberia.

NAME (first and last)	SEX	COHORT	STUDENT STATUS	UNIVERSITY	SUBJECT AREA	ACADEMIC LEVEL	GRADUATION YEAR
1. Zolue, G Moses	M	COHORT 3	COMPLETED	Texas Tech University	Plant and Soil Science	PhD	FY2020
2. Dunbar, Alexander	M	COHORT 3	COMPLETED	University of Nairobi	Environmental Governance	MSc	FY2018
3. Hinneh, Mandela	M	COHORT 3	COMPLETED	University of Ghana	Aquaculture	MSc	FY2017
4. Leesolee, Nathaniel	M	COHORT 3	COMPLETED	University of Nairobi	Bioinformatics	MSc	FY2018
5. Mulbah, Samuel	M	COHORT 3	COMPLETED	University of Ghana	Aquaculture	MSc	FY2017
6. Wehye, Austin	M	COHORT 3	COMPLETED	University of Ghana	Fisheries Sciences	MSc	FY2017
7. Williams, Cheryl	F	COHORT 3	COMPLETED	Texas Tech University	Agricultural Education and Communications	PhD	FY2019
8. Dokpa, Meco	M	COHORT 3	WITHDRAWN	Kansas State University	Entomology	PhD	-
9. Johnson, Dans	M	COHORT 3	WITHDRAWN	University of Ghana	Plant Breeding	PhD	-
10. Kargbo, Irene	F	COHORT 3	WITHDRAWN	Ohio State University	Entomology	PhD	-
11. Kezelee, Lorpui	F	COHORT 3	WITHDRAWN	University of Ghana	Seed Science and Technology	MSc	-
12. Matthews, Serina	F	COHORT 3	WITHDRAWN	University of Ghana	Crop Science	MSc	-

13. Moore, Davidetta	F	COHORT 3	WITHDRAWN	University of Ghana	Seed Science and Technology	MSc	-
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## PAPER PUBLICATIONS BY SCHOLARS

The BHEARD scholars from Liberia were among the least prolific of all the country cohorts (.7 publications per student). There were clearly deficiencies in the academic preparation of the Liberian students and this carried through to their publication record. In the future, it would be good to provide specific publication support for scholars who may have come from less rigorous academic backgrounds.

STUDENT NAME	TITLE	AUTHORS	PUBLISHED IN	PUBLICATION DATE
1. Alexander Dunbar	Factors influencing the sustainable utilization of artisanal fisheries: A case of west point, Liberia	"Alexander Dunbar David Mungai John Kaunga Muthee"	International Journal of Fisheries and Aquatic Studies	04/26/21
2. Wehye, Austin	Population Structure of Pseudotolithus Senegalensis and Pseudotolithus Typus and Their Implications for Management and Conservation within the Coastal Waters of Liberia	Austin Saye Wehye, Patrick K Ofori-Danson, and Angela Manekuor Lamptey	Fisheries and Aquaculture Journal	05/18/17
3. Wehye, Austin	Growth, Mortality and Exploitation Rates of Lesser African Threadfin, Galeoides Decadactylus (Bloch,1795) within the Coastal Waters of Liberia	Austin Saye Wehye and Samuel KK Amponsah	International Journal of Fisheries and Aquatic Research	03/01/17
4. Wehye, Austin	Aspects of Population Dynamics of Pseudotolithus Typus (Bleeker, 1863) with Management Implications within the Coastal Waters of Liberia	Austin Saye Wehye and Samuel KK Amponsah	International Journal of Fisheries and Aquatic Studies	02/16/17
5. Zolue, G Moses	Plant-available zinc fixation kinetics in semi-arid alkaline soils of the Southern High Plains	Theophilus K. Udeigwe, Madeleine Eichmann, Peter N. Eze, Jasper M Teboh, Gondah M. Zolue, & Obiageli P. Umeugochukwu	Archives of Agronomy and Soil Science	09/19/16

## Malawi

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 than that of US institutions. This was enabled, in part, by the 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 Kalimira & 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	Owen Austin Banda, Maurice Ongalo Udoto and Joel Kipkemoi Ng'eno	International Journal of Agriculture and Environmental Research	04/28/20

	MAIZE FARMING IN MZIMBA SOUTH, MALAWI			
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 Nkirete 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; Nyaiika, 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 Agricultural Research	08/01/18

18. Mwafulirwa, Samuel	Isolation of Indigenous Glyphosate Degrading Microbes from Selected Agro Ecological Zones of Malawi	Samuel Mwafulirwa, George Obiero, Placid Mpeketula, and Gabriel Aboqe	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	"Harrington Nyirenda, Eméline P. S. Assédé, Paxie W. Chirwa, Coert	Agroforestry Systems	02/07/19



	distribution in Malawian Miombo woodland agroecosystem	Geldenhuys, Francis W. Nsubuga"		
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

## *Mali*

### Activity Summary

BHEARD sponsored 23 scholars from Mali and 21 of them successfully completed their program and went back to their home institutions after completion of their degree programs.

### Successes

The notable success of the Mali BHEARD program is the very high completion rate. A total of 91% of the scholars were able to complete their program, although COVID played an important role in delaying the completion dates of four of the scholars, who were forced to complete their degree programs after the conclusion of the BHEARD scholars program.

### Challenges

Two scholars were suspended due to violation of Conditions of sponsorship contract and low grades respectively. Four PhD scholars completed their degree programs after the conclusion of the BHEARD scholars program in September, 2021.

### List of All Scholars

The complete list of BHEARD scholars from Mali is as follows:

NAME (first and last)	SEX	COHORT	STUDENT STATUS	UNIVERSITY	SUBJECT AREA	ACADEMIC LEVEL	GRADUATION YEAR
1. Keita, Adam	F	COHORT 5	COMPLETED	KNUST	Meteorology and Climate Science	MPhil	FY2020
2. Abdoulaye, Moussa	M	COHORT 4	COMPLETED	University of Ghana	Seed Science and Technology	MPhil	FY2019
3. Bouare, Adama	M	COHORT 4	COMPLETED	University of Ghana	Agricultural Economics	MPhil	FY2019
4. Diallo, Aboubacar	M	COHORT 4	COMPLETED	KNUST	SUSTAINABLE AND INTEGRATED RURAL DEV	MPhil	FY2018
5. Diarra, Fatimata	F	COHORT 4	COMPLETED	KNUST	SUSTAINABLE AND INTEGRATED RURAL DEV	MPhil	FY2018
6. Macalou, Moussa	M	COHORT 4	COMPLETED*	University of Ghana	Agricultural Economics	PhD	2021
7. Maiga, Alfousseiny	M	COHORT 4	COMPLETED*	University of Ghana	Plant Breeding	PhD	2021
8. Sissoko, Aminata	F	COHORT 4	COMPLETED*	University of Ghana	Food Science	PhD	2021
9. Traore, Sanata	F	COHORT 4	COMPLETED*	University of Ghana	Crop Science and Agronomy	PhD	2021
10. Sidibe, Salif	M	COHORT 4	WITHDRAWN	University of Ghana	Agricultural Economics	MSc	-

11. Samasse, Kaboro	M	COHORT 3	COMPLETED	South Dakota State University	Geospatial Science and Engineering	PhD	FY2021
12. Coulibaly, Ayouba	M	COHORT 3	COMPLETED	Egerton University	Agricultural Economics	MSc	FY2019
13. Dembele, Bandiougou	M	COHORT 3	COMPLETED	Egerton University	Agricultural Economics	PhD	FY2018
14. Camara, Mounirou	M	COHORT 3	COMPLETED	University of Nairobi	Biotechnology	MSc	FY2021
15. Dembele, Kadidia	F	COHORT 3	COMPLETED	Egerton University	Agribusiness Management	MSc	FY2018
16. Kane, Abdoulah	M	COHORT 3	COMPLETED	Egerton University	Agricultural Economic and Management	PhD	FY2019
17. Kante, Macire	M	COHORT 3	COMPLETED	University of Nairobi	Information Systems	PhD	FY2018
18. Keita, Mahamadou	M	COHORT 3	COMPLETED	Egerton University	Environmental Science	PhD	FY2019
19. Macalou, Salouma	M	COHORT 3	COMPLETED	Egerton University	Soil Science	MSc	FY2018
20. Nientao, Abdoulaye	M	COHORT 3	COMPLETED	Egerton University	Agricultural Economics	MSc	FY2019
21. Thiam, Sidibe	F	COHORT 3	COMPLETED	Egerton University	Agricultural Information and Communication Management	MSc	FY2018
22. Guindo, Modibo	M	COHORT 3	COMPLETED	Egerton University	Agricultural Economics	MSc	FY2019
23. Konte, Mahamadou	M	COHORT 3	WITHDRAWN	Egerton University	Agricultural Economics	MSc	-

### Paper Publications by Scholars

The BHEARD scholars from Mali had a respectable 1.7 publications per graduating scholar. Although this is not the highest publication rate for the BHEARD program, it places the Malian scholars in the top ten percent of country programs for publication rates.

STUDENT NAME	TITLE	AUTHORS	PUBLISHED IN	PUBLICATION DATE
1. Aboubacar Diallo	Climate change adaptation strategies, productivity and sustainable food security in southern Mali	Aboubacar Diallo, Emmanuel Donkor, Victor Owusu	Climatic Change	03/19/20
2. Aboubacar Diallo	Determinants of Food Insecurity among Maize Farming Households in the Southern Region of Mali	Aboubacar Diallo, Asiamah Maxwell Toah2	Journal of Food Security	09/06/19
3. KANE ABDOUL	Economic Efficiency of Vegetable Production under Small Scale	Kane Abdoulah Mamary, Diakalia Sogodogo, Ginette Dembele, Kalifa Traore, J K Lagat	Springer	12/01/21

AH MAMARY	Irrigation Systems in Koulikoro and Mopti Regions in Mali/West Africa			
4. Sanata Traoré	Efficacité des traitements de lavage courants pour réduire les niveaux microbiens sur la laitue au Mali	Sanata Traoré, Fassé Samaké, Eric W. Cornelius, Amadou H. Babana, Gloria L. Essilfie, Daouda Diabaté, Mamoutou Bengaly, Abou Koné, Habibatou Cissé	Malian Symposium for Applied Science	08/06/21
5. Sanata Traoré	Production de légumes irrigués avec des eaux usées: connaissance et perception des acteurs de la chaîne de valeur à Bamako, Kati et Baguineda	Sanata Traoré, Fassé Samaké, Amadou Hamadou Babana, Eric W. Cornelius, Gloria Essilfie, Abou Koné, Mamoutou Bengaly, Lassine Doumbia, Timothé A. Dara, Sognan Dao	Malian Symposium for Applied Science	12/25/20
6. Alfousseiny Maiga	Development of female parent sorghum with high lysine and threonine content in Mali	A.M. Maiga, A.G. Diallo, , A. Daou, A. Touré, A. Danquah , E. Danquah	Journal of Genetics, Genomics & Plant Breeding	07/11/21
7. Alfousseiny Maiga	Combining ability for grain yield and grain components of sorghum hybrid containing high lysine, threonine, iron and zinc content in Mali	A.M. Maiga, A.G. Diallo, A. Touré, B. Nebie, A. Danquah, E. Danquah	Journal of Genetics, Genomics & Plant Breeding	07/15/21
8. Sanata Traoré	Efficiency of common washing treatments in reducing microbial levels on lettuce in Mali	Sanata Traoré, Eric Williams Cornelius, Fassé Samaké, Gloria Essilfie, Amadou Hamadoun Babana, Mamoutou Bengaly, Abou Koné, Habibatou Cissé, Mavis Agyeiwaa Acheampong	West African Journal of Applied Ecology	12/31/20
9. Kaboro Samasse	A High-Resolution Cropland Map for the West African Sahel Based on High-Density Training Data, Google Earth Engine, and Locally Optimized Machine Learning	"Kaboro Samasse Niall P. Hanan Julius Y. Anchang and Yacouba Diallo"	Remote Sensing	05/01/20
10. Kaboro Samasse	Assessing Cropland Area in West Africa for Agricultural Yield Analysis	"Kaboro Samasse Niall P. Hanan Gray Tappan and Yacouba Diallo"	Remote Sensing	11/10/18
11. Abdoulaye, Moussa	Micropropagation de deux variétés de papayer ( <i>Carica papaya</i> L.) à l'IPR/IFRA de Katibougou, Mali	Abdoulaye Sidibé, Maman Sani Ladan Harouna, Bakary Mamourou Traoré, Moussa Abdoulaye, and Ousmane Niangaly	International Journal of Biological and Chemical Sciences	10/01/17
12. Coulibaly, Ayouba	Effects of Zai Pits and Half-Moon Technologies on Smallholder Farmers' Income in Kita Cercle, Mali	Ayoubou Coulibaly	The International Journal of Humanities & Social Studies	10/29/18

13. Dembele, Bandiougu	Factors influencing crop diversification strategies among smallholder farmers in cotton production zone in Mali	Dembele, B., Bett, H., Kariuki, I., Bars, M., Ouku, K.	Advances in Agricultural Science	05/16/18
14. Dembele, Bandiougu	UNDERSTANDING THE MULTIPLE SOURCES DRIVERS OF AGRICULTURAL INCOME AMONGST SMALLHOLDER FARMERS IN SOUTHERN MALI	Dembele, B., Bett, H., Kariuki, I., Bars, M.	Review of Agricultural and Applied Economics	11/01/18
15. Dembele, Bandiougu	Dynamics and adaptation of agricultural farming systems in the boost of cotton cropping in southern Mali	Dembele, B., Bett, H., Mutai, M., Bars, M.	Academic Journals	03/15/17
16. Diarra, Fatimata	"An Be Jigi": Collective cooking, whole grains, and technology transfer in Mali	Wenda K. Bauchspies, Fatimata Diarra, Fred Rattunde, Eva Weltzien	FACETS	11/30/17
17. Guindo, Modibo	Determinants of Market Participation Among Pearl Millet Farmers in Dioila Cercle, Mali	"Modibo Guindo, Bett K. Hillary, Amadou Guindo, Assoumane Maiga, Lassina Diakite"	Journal of Economics and Sustainable Development	
18. Kane Abdoulah Mamary	An Assessment of Early Warning Systems to Drought Resilience among Agricultural Communities in Tanzania, Kenya and Mali	Paschal Arsein Mugabe, Fiona Mwaniki, Kane Abdoulah Mamary, H.M.Ngibuini	Elsevier, ScienceDirect	02/01/19
19. Kane, Abdoulah	Economic Viability of Alternative Small- Scale Irrigation Systems Used in Vegetables Production in Koulikoro and Mopti Regions, Mali	A. M. Kane, J. K. Lagat, T. Fane, J. K. Langat, and B. Teme	Springer International Publishing AG, part of Springer Nature	07/26/18
20. Kane, Abdoulah	Economic efficiency of water use in the small scale irrigation systems used in vegetables production in Koulikoro and Mopti regions, Mali	Abdoulah Mamary Kane, Job Kibiwot Lagat, Jackson Kipnetich, Bino Teme, Samuel Ngunjiri Wamuyu	Advances in Agricultural Science	09/11/18
21. Kante, Macire	Farmers' perceptions of ICTs and its effects on access and use of agricultural input information in developing countries: Case of Sikasso, Mali	Kante, M., Oboko, R., Chepken, C., Hamunyela, S.	IST Africa	11/08/17
22. Kante, Macire	An ICT model for increased adoption of farm input information in developing countries: A case in Sikasso, Mali	Kante, M., Oboko, R., Chepken, C.	Information Processing in Agriculture	09/01/18
23. Kante, Macire	Influence of perception and quality of ICT-based agricultural input information on use of ICTs by farmers in developing countries: Case of Sikasso in Mali	Kante, M., Oboko, R., Chepken, C.	The Electronic Journal of Information Systems in Developing	11/01/17

			Countries; Hong Kong	
24. Kante, Macire	Factors affecting the use of ICT s on agricultural input information by farmers in developing countries	Kante, M., Oboko, R., Chepken, C.	Journal of Information Systems and Technology Management	08/01/17
25. Kante, Macire	A knowledge management system for indigenous crops production: Case of sorghum farming in south Tharaka, Kenya	Oboko, R., Kimani, J., Kante, M., Chepken, C., Wario, R., Kiai, R.N.	AIMS Press	04/01/16
26. Kante, Macire	Effects of Farmers' Peer Influence on the Use of ICT-based Farm Input Information in Developing Countries: A Case in Sikasso, Mali	Macire Kante, Christopher Chepken, Robert Oboko	Journal of Digital Media & Interaction	
27. Kante, Macire	ICT's Model for Cereal Farmers in the Access and Use of Agricultural Input Information in Developing Countries: Questionnaire Validation Using SEM	Macire Kante, Robert Oboko, and Christopher Chepken	American Journal of Information Systems	
28. Kante, Macire	Revisitant les facteurs affectant l'utilisation des Tics sur l'information relative aux intrants agricoles par les paysans dans les pays en voie de développement	Macire Kante, Christopher Chepken, and Robert Oboko	Journal of Information Systems and Technology Management	05/01/17
29. Kante, Macire	Partial Least Square Structural Equation Modelling' Use in Information Systems: An Updated Guideline of Practices in Exploratory Settings	Macire Kante, Christopher Chepken and Robert Oboko	Kabarak Journal of Research and Innovation	03/15/18
30. Keita, Mahama dou	Impacts of Artisanal Gold Mining on Water Quality: A Case Study of Tangandougou Commune in Sikasso Region, Mali	Mahamadou Moussa Keita, George Morara Ogendi, George Owuor, Wycliff N. Nyamao	Journal of Environmental Health and Sustainable Development	10/20/18
31. Macalou, Moussa	Perennial Grain Crops in the West Soudanian Savanna of Mail: Perspectives from Agroecology and Gendered Spaces	Paul Rogé, Tidiane Diarisso, Fatoumata Diallo, Youssouf Boiré, Diakaridia Goïta, Brad Peter, Moussa Macalou, Eva Weltzien, & Sieglinde Snapp	International Journal of Agricultural Sustainability	09/06/17
32. Macalou, Salouma	The Cassava genotypes N P K nutrient uptake in leave and its growth and yield parameters regression under inorganic NPK (15-15-15) application rates in southern Mali, West Africa	Salouma Macalou, Amos Musandu, and Samuel Mwonga	Advances in Agricultural Science	09/05/18
33. Nientao, Abdoulay e	Resource Optimization in Crop Livestock Integrated Production	Abdoulaye Nientao, Dave Mwangi, Oscar Ingasia Ayuya, Alpha Oumar Kergna	Advances in Agricultural Science	11/06/18

	System among Small-Scale Cotton Farmers in Southern Mali			
34. Samasse, Kaboro	Assessing Cropland Area in West Africa for Agricultural Yield Analysis	Kaboro Samasse, Niall P. Hanan, Gray Tappan, and Yacouba Diallo	MDPI	11/10/18
35. Sissoko, Aminata	"Détermination de la teneur en résidus de cinq pesticides organochlorés dans le lait des grands bassins laitiers au Mali-Sud"	Boubacar Madio dit Aladiogo MAÏGA, Ibrahima Koné, Oumou HAÏDARA, Salimata Koné, Fousseni Diallo Alimata Berthée, Idrissa Traoré, Aminata Sissoko	International Journal of Biological and Chemical Sciences	01/08/12
36. Thiam, Sidibe	The Role of Information and Communication Sharing Pathway in Improving Peri-Urban Dairy System of Bamako, Mali	Sidibe M'baye Thiam, Joseph Wafula Matofari	American Journal of Science, Engineering and Technology	03/06/18

### *Mozambique*

BHEARD sponsored 22 scholars from Mozambique, 18 successfully completed their program and went back to their home institutions after completion of their degree programs.

#### Successes

The decision to educate Mozambican scholars at Brazilian universities turned out to be a very good decision. The high quality of the Brazilian programs was evident in the academic rigor displayed in the theses and dissertations of the Mozambican students. The cost of educating in Brazil was significant lower than the cost of educating in the US, and the Mozambican students flourished under both the rigor and the discipline of the Brazilian programs. Not one Mozambican scholar experienced delays in the completion of their programs, much to the credit of the academic authorities at the institutions at which they studied. At the request of the Mozambique Mission the BHEARD scholars were concentrated in the area of nutrition. Through the BHEARD program, a significant contribution was made to the human capital in nutrition in Mozambique.

#### Challenges

Four scholars were withdrawn due to the following reason:

- Two for personal
- One for not completing within the timeline
- One for low grades



Figure 1 Josee Aulario Dique, Hybridization



Figure 2 BHEARD scholar from Mozambique during her thesis defense.

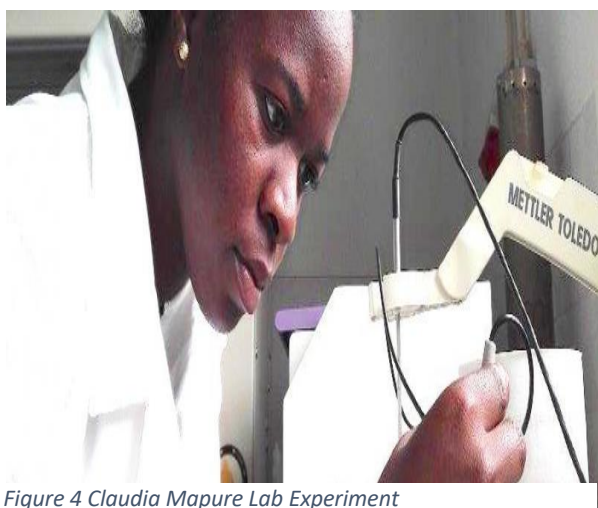


Figure 4 Claudia Mapure Lab Experiment



Figure 3 Violeta Macie placing the tray while collecting excrete

## LIST OF ALL SCHOLARS

The following scholars participated in the BHEARD Mozambique scholars program, sponsored by the USAID Mozambique Mission.

NAME (first and last)	SEX	COHORT	STUDENT STATUS	UNIVERSITY	SUBJECT AREA	ACADEMIC LEVEL	GRADUATION YEAR
1. Alforma, Antonia	F	COHORT 6	COMPLETED	Federal University of Rio Grande do Sul	Animal Science	MSc	FY2020
2. Culpa, Matias	M	COHORT 6	COMPLETED	FIOCRUZ	Public Health	MSc	FY2021



3.	Eduardo, Rosana	F	COHORT 6	COMPLETED	Universidade Federal de Lavras	Administration	MSc	FY2020
4.	Pedro, Cesar	M	COHORT 6	COMPLETED	Universidade Federal de Vicosa	Genetics and Improvement	MSc	FY2020
5.	Vulalo, Maria	F	COHORT 6	COMPLETED	Universidade Federal de Vicosa	Plant Science	MSc	FY2021
6.	Dique, Jose	M	COHORT 5	COMPLETED	Universidade Federal de Vicosa	Genetics and Improvement	MSc	FY2020
7.	De Castro, Elsa Merina Jose Joaquim	F	COHORT 5	COMPLETED	University of Eduardo Mondlane	Food Technology	MSc	FY2020
8.	Tambo, Fidel	M	COHORT 5	COMPLETED	Universidade Federal de Lavras	Agricultural Resources	MSc	FY2019
9.	Bengala, Pedro	M	COHORT 5	COMPLETED	Universidade Federal de Vicosa	Plant Engineering	MSc	FY2019
10.	Fazenda, Lucidio	M	COHORT 5	COMPLETED	Universidade Federal de Lavras	Agronomy and Plant breeding	MSc	FY2019
11.	Francisco, Cremildo		COHORT 5	COMPLETED	Universidade Federal de Santa Catarina	Agroecosystems	MSc	FY2019
12.	Janeque, Ricardina	M	COHORT 5	COMPLETED	Universidade Federal de Santa Maria	Agribusiness	MSc	FY2019
13.	Macie, Violeta	F	COHORT 5	COMPLETED	Universidade Federal de Mato Grosso do Sul	Animal Science	MPhil	FY2019
14.	Muchanga, Maria	F	COHORT 5	COMPLETED	Universidade Federal de Santa Catarina	Agricultural and Natural Ecosystems	MSc	FY2020
15.	Paulo, Edvaldo	F	COHORT 5	COMPLETED	Universidade Federal de Vicosa	Plant Engineering	MSc	FY2019
16.	Mapure, Claudia	F	COHORT 3	COMPLETED	University of Eduardo Mondlane	Food Technology	MSc	FY2018
17.	Alface, Angelo	M	COHORT 3	COMPLETED	Universidade Federal de Vicosa	Water and Environmental Resources	MSc	FY2018
18.	Assamo, Samito	M	COHORT 3	WITHDRAWN	Federal University of Rio Grande do Sul	-	MSc	-
19.	Sabe, Iris	F	COHORT 2	COMPLETED	University of Eduardo Mondlane	Food Technology	MSc	FY2016
20.	Sitoe Cachomba, Isabel	F	COHORT 2	WITHDRAWN	Virginia Tech	Economics, Agriculture	PhD	-
21.	Tomo, Alda	F	COHORT 1	WITHDRAWN	Virginia Tech	Economics, Agriculture	PhD	-
22.	Possolo, Edna	F	COHORT 1	WITHDRAWN	Cornell University	Nutrition	MSc	-

## PAPER PUBLICATIONS BY SCHOLARS

Completing scholars were responsible for the following publications. The publication rate for Mozambican scholars (.8) is slightly below the average for BHEARD country cohorts, but this may be attributed to the fact that the majority of Mozambican scholars were pursuing Masters degrees rather than PhDs. In light of that fact, the publication rate for the Mozambican scholars is quite impressive.

STUDENT NAME	TITLE	AUTHORS	PUBLISHED IN	PUBLICATION DATE
1. Angelo Baptista Alface	Evaluative mapping of the area irrigated by center pivot in Mozambique	Ângelo Baptista Alface and Hélio do Rosário Luís Armazia	Forestry Researcher and Engineering: International Journal	11/22/19
2. Angelo Baptista Alface	Sugarcane spatial temporal monitoring and crop coefficient estimation through NDVI	Silvio Bueno Pereira, Roberto Filgueiras and Fernando França da Cunha	Revista Brasileira de Engenharia Agrícola e Ambiental	05/23/19
3. Cremildo António Luís Francisco	Aggregation, carbon, nitrogen, and natural abundance of <sup>13</sup> C and <sup>15</sup> N in soils under no- tillage system fertilized with injection and surface application of pig slurry for five years	Cremildo António Luís Francisco, Arcângelo Loss, Gustavo Brunetto, Rogério Gonzatto, Sandro José Giacomini, Celso Aita, Marisa de Cássia Piccolo, Carina Marchezan, Gustavo Scopel & Ricardo Fagan Vidal	CARBON MANAGEMENT	05/16/21
4. Alface, Angelo	Sugarcane Spatial-Temporal Monitoring and Crop Co-efficient Estimation Through NDVI	Angelo B. Alface, Silvio B. Pereira, Roberto Filgueiras, and Fernando F. Cunha	Revista Brasileira de Engenharia Agrícola e Ambiental	03/28/19
5. Alforma, Antónia Mendes Paizano	Desempenho em bovinos de corte	Antónia Alforma, Helena Fagundes, Luís Felipe Bellebone e Brum, Everton Sartori e Júlio Barcellos	Revista AG	11/20/19
6. Alforma, Antónia Mendes Paizano	Reproductive parameters of beef cows weaned early	Antónia Mendes Paizano Alforma, Marcela Kuczynski da Rocha, Odilene de Souza Teixeira, Júlia Abud Lima, Vanessa Silva Fernandes, Júlio Otávio Jardim Barcellos	Rev. Bras. Reprod. Anim	07/08/19
7. Alforma, Antónia Mendes Paizano	Aspectos reprodutivos de vacas de corte submetidas à diferentes tipos de desmame	Antónia Mendes Paizano Alforma, Marcela Kuczynski da Rocha, Odilene de Souza Teixeira , Yago Machado da Rosa , Maria Carolina Muniz de Oliveira , Téis Adolfo Cumbe & Júlio Otávio Jardim Barcellos	ANAIS XIV JORNADA NESPro & IV SIMPÓSIO INTERNACIONAL SOBRE SISTEMAS DE PRODUÇÃO DE BOVINOS DE CORTE	09/10/19
8. Alforma, Antónia	Respostas fisiológicas de terneiros de corte desmamados em idades diferentes	Odilene de Souza Teixeira , Marcela Kuczynski da Rocha , Everton Dezordi Sartori , Antónia Mendes		09/10/19

Mendes Paizano		Paizano Alforma , Vanessa Silva Fernandes , Maria Eugênia Andrighetto Canozzi & Júlio Otávio Jardim Barcellos		
9. Alforma, Antônia Mendes Paizano	Evolução da produção de bovinos de corte no Rio Grande do Sul: uma análise temporal	Maria Carolina Muniz de Oliveira , Odilene de Souza Teixeira , Antônia Mendes Paizano Alforma & Júlio Otávio Jardim Barcellos		09/10/19
10. Dique, Jose	Desempenho de progênies de feijão vermelho visando obtenção de linhagens de porte ereto	Lenin Pereira Barros, JOSE EUSTAQUIO DE SOUZA CARNEIRO ,Ana Laura Nicomedes Carneiro, José Eulário Lampi Dique, Michel Henriques de Souza, Vinícius Lopes de Melo	SIA- SIMPOSIO DE INTEGRACAO ACADEMICA	10/25/19
11. Dique, Jose	PARÂMETROS GENÉTICOS DE CARACTERES CORRELACIONADOS COM A PRODUTIVIDADE DO GRÃO DE FEIJÃO GUANDU		César Pedro1*; Marques Cachisso Bambo Donça2; Cosme Damião Cruz1; Salva Inácio Somueque2 Ivan Paiva Barbosa Magalhães1; José Eulário Lampi Dique3.	05/30/19
12. Dique, Jose	Comportamento agrônomo de linhagens de feijão carioca no ciclo I de seleção recorrente desenvolvidos na UFV, em Coimbra, MG, na safra 2017	DIAS, F. S.1; TRINDADE, T. F. H.1; DIQUE, J. E. L.1; MOREIRA, J. V. C.1; BUSATTE, W. A. B.1; CARNEIRO, J. E. S.2		10/10/19
13. Dique, Jose	Resposta à inoculação de Bradyrhizobium japonicum em linhagens de soja em Moçambique	DIQUE, J. E. L., SILVA, R. A., CASAGRANDE, C. R. STECKLING, S. M., ROMANO, N., CARNEIRO, J. E. S.		
14. Janeque, Ricardina	Analysis of the Generation of Formal Employment by the Soybeans Production Chain in the Rio Grande Do Sul State/Brazil:2002-2015	"Angelica Cristina Rhoden, Nilson Luiz Costa, Antonia Cordeiro de Santana, Maiara Thais Tolfo Gabbi, Ricardina Antonio Janeque"	International Journal of Development Research	12/30/17
15. Pedro, Cesar	Associações da qualidade sensorial com características agronômicas em genótipos de Coffea arabica L.	CHAGAS, F. E. O; BARBOSA, I. P.; PEDRO, C.; SILVA, R. P.; OLIVEIRA, A.C.B.	<a href="https://www.genmelhor.com.br/publicacoes">https://www.genmelhor.com.br/publicacoes</a> (Título: Anais do IX Simpósio Internacional de Genética e Melhoramento - Big data: dos dados aos resultados Ano: 2018 ISBN: 978-85-	2018

			93566-04-2 (E-book))	
16. Pedro, Cesar	Associações da qualidade sensorial com características agronômicas em genótipos de Coffea arabica L.	CHAGAS, F. E. O; BARBOSA, I.; P. PEDRO, C.; SILVA, R. P.; OLIVEIRA, A.C.B.	<a href="https://www.genmelhor.com.br/publicacoes">https://www.genmelhor.com.br/publicacoes</a> (Anais do IX Simpósio Internacional de Genética e Melhoramento - Big data: dos dados aos resultados Ano: 2018 ISBN: 978-85-93566-04-2 (E-book))	2018
17. Pedro, Cesar	Estimation of genetic parameters and correlations of maize hybrids evaluated under optimal and drought conditions in East Africa	PEDRO, C.; OLIVEIRA NETO, J.A.G.; COSTA, L.Q.C. ; BEYENE, Y.;	<a href="https://www.genmelhor.com.br/publicacoes">https://www.genmelhor.com.br/publicacoes</a> (Anais do X Simpósio Internacional de Genética e Melhoramento - Avançando as Fronteiras do Melhoramento de Plantas: Bioinformática, Biotecnologia e Análise Experimental Ano: 2019 ISBN: 978-85-93566-06-6 (E-book))	2019
18. Pedro, Cesar	Environmental stratification of multi-environmental trials in East Africa	PEDRO, C.; SOUSA, J.V.S.; DANTAS, O.H.G. ; BEYENE, Y.; REZENDE, W.S.; CRUZ, C.D."	<a href="https://www.genmelhor.com.br/publicacoes">https://www.genmelhor.com.br/publicacoes</a> (Anais do X Simpósio Internacional de Genética e Melhoramento - Avançando as Fronteiras do Melhoramento de Plantas: Bioinformática, Biotecnologia e Análise Experimental Ano:	2019

			2019 ISBN: 978-85-93566-06-6 (E-book))	
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## *Rwanda*

BHEARD sponsored 41 and 27 successfully completed their program and went back to their home institutions after completion of their degree programs. Of those who completed, 13 are from Cohort 3, 7 from Cohort 4 and 7 scholars completed from Cohort 5. Fourteen scholars withdrew or were withdrawn from the program due to various reasons. This was the highest attrition rate of any country program.

### Successes

For those scholars completing the program, the Rwandan cohort of BHEARD students had among the highest publication rates of all country programs. The level of academic productivity bodes well for these scholars and Rwanda will benefit from the investment in their education.

### Challenges

Fourteen scholars were unable to complete their program and have been withdrawn from the program due to different reasons:

- Two scholars declined scholarships before starting the programs
- Two scholars violated the conditions of sponsorship
- Nine scholars did not complete within the timeline.

The last of these reasons was especially disconcerting. Agreements were negotiated with the participating universities in Kenya to waive the requirement to develop a thesis proposal prior to admission into the graduate schools at these institutions. The first year of BHEARD studies was allotted for the purpose of allowing students time to prepare proposals and submit them for approval in the first year. Few of the students completed a proposal within the first year, and several of the students spent considerable amounts of time at home in Rwanda rather than attending the university. Although this was a violation of BHEARD conditions scholarship, the BHEARD East African coordinator only discovered these departures after the fact, since students did not inform the coordinator of their departures, as was required. Although the BHEARD program attempted to discern the status of the students after the program closed, few of the students responded to update their status. As a result of this lack of compliance and lack of diligence, the Rwandan country cohort represents one of the lowest completion rates of all the BHEARD countries at (66%).

### **LIST OF ALL SCHOLARS**

The list of all BHEARD students was the following:

NAME (first and last)	SEX	COHORT	STUDENT STATUS	UNIVERSITY	SUBJECT AREA	ACADEMIC LEVEL	GRADUATION YEAR
1. Habimana, Richard	M	COHORT 5	COMPLETED	Egerton University	Animal Science	PhD	FY21

2.	Ndayitegeye, Olivier	M	COHORT 5	COMPLETED	Egerton University	Water Resource and Environmental Management	PhD	FY21
3.	Ndereyimana, Assinapol	M	COHORT 5	COMPLETED	Egerton University	Horticulture	PhD	FY20
4.	Nyabinwa, Pascal	M	COHORT 5	COMPLETED	Egerton University	Animal Science	PhD	FY21
5.	Rwubatse, Bernard	M	COHORT 5	COMPLETED	Univ. of Nairobi	Food Science and Technology	PhD	-
6.	Waweru, Bancy	F	COHORT 5	COMPLETED	Univ. of Nairobi	Crop Protection	PhD	FY21
7.	Djangwani, Juvenal	M	COHORT 5	WITHDRAWN	Univ. of Nairobi	Food Science and Technology	PhD	-
8.	Gashururu, Richard	M	COHORT 5	WITHDRAWN	Univ. of Nairobi	Applied Veterinary Parasitology	PhD	-
9.	Kambabazi, Marie-Rose	F	COHORT 5	WITHDRAWN	Univ. of Nairobi	Food Science and Technology	PhD	-
10.	Murindwa, Erneste	M	COHORT 5	WITHDRAWN	Univ. of Nairobi	Food Science and Technology	PhD	-
11.	Nshimiyimana, Octave	M	COHORT 5	WITHDRAWN	Univ. of Nairobi	Crop Protection	PhD	-
12.	Nzeyimana, Felix	M	COHORT 5	WITHDRAWN	Univ. of Nairobi	Soil Science	PhD	-
13.	Udahemuka, Jean Claude	M	COHORT 5	WITHDRAWN	Univ. of Nairobi	Biotechnology	PhD	-
14.	Umunezero, Olive	F	COHORT 5	WITHDRAWN	Univ. of Nairobi	Animal Production	PhD	-
15.	Karayire, Aulalia	F	COHORT 5	WITHDRAWN	Univ. of Nairobi	Applied Human Nutrition	PhD	-
16.	Mukamurezi, Godelieve	F	COHORT 5	WITHDRAWN	Univ. of Nairobi	Food Science and Technology	PhD	-
17.	Uwihirwe Judith	F	COHORT 5	WITHDRAWN	Uni. of Nairobi	Dryland Resource Management	PhD	-
18.	Ayabagabo, Jean De Dieu	M	COHORT 5	COMPLETED	Egerton University	Animal Science	PhD	-
19.	Kamatenesi, Jovia	F	COHORT 4	COMPLETED	Univ. of Nairobi	Horticulture	MSc	FY19
20.	Manishimwe, Rosine	F	COHORT 4	COMPLETED	Texas Tech University	Animal Science	PhD	FY20
21.	Mbarushimana, Jean De Dieu	M	COHORT 4	COMPLETED	Univ. of Nairobi	Agronomy	MSc	FY19
22.	Mwungura, Marc	M	COHORT 4	COMPLETED	Univ. of Nairobi	Soil Science	MSc	FY21
23.	Niyikiza, Daniel	M	COHORT 4	COMPLETED	University of Tennessee	Plant Science	PhD	FY21
24.	Shingiro, Bosco	M	COHORT 4	COMPLETED	Michigan State Univ.	Food Science	PhD	FY21
25.	Nishimwe, Kizito	M	COHORT 4	COMPLETED	Iowa State Univ.	Food Science and Technology	PhD	FY20
26.	Kabeja, Alice	F	COHORT 3	COMPLETED	Univ. California, Davis	Horticulture and Agronomy	PhD	FY20

27. Bigirimana, Joseph	M	COHORT 3	COMPLETED	Michigan State University	Entomology	PhD	FY19
28. Byukusenge, Maurice	M	COHORT 3	COMPLETED	Penn State University	Pathobiology	PhD	FY20
29. Dutuze, Marie	F	COHORT 3	COMPLETED	Louisiana State University	Pathobiological Sciences	PhD	FY19
30. Mazimpaka, Eugene	M	COHORT 3	COMPLETED	Makerere University	Veterinary Medicine	MSc	FY17
31. Mpatwenumugabo, Jean Pierre	M	COHORT 3	COMPLETED	University of Nairobi	Applied Microbiology (Bacteriology)	MSc	FY18
32. Mwizerwa, Herve	M	COHORT 3	COMPLETED	University of Nairobi	Food Science and Technology	MSc	FY18
33. Ntampaka, Pie	M	COHORT 3	COMPLETED	University of Nairobi	Veterinary Pathology, Microbiology and Parasitology	MSc	FY18
34. Rukundo, Jean De Dieu	M	COHORT 3	COMPLETED	University of Nairobi	Livestock Production	MSc	FY18
35. Tumukunde, Ella	F	COHORT 3	COMPLETED	University of Nairobi	Agricultural Economics	MSc	FY19
36. Uwituze, Chantal	F	COHORT 3	COMPLETED		Soil Science	MSc	FY18
37. Uwizeyimana, Dieudonne	M	COHORT 3	COMPLETED	University of Nairobi	Land and Water Management	MSc	FY19
38. Kayitesi, Claudine	F	COHORT 3	COMPLETED	University of Nairobi	Agricultural Economics	MSc	FY20
39. Dushimayezu, Bertrand	M	COHORT 3	WITHDRAWN	University of Nairobi	Agricultural and Applied Economics	MSc	-
40. Niragire, Ildephonse	M	COHORT 3	WITHDRAWN	University of Nairobi	Agricultural Resource Management	MSc	-
41. Mutoni, Doreen	F	COHORT 3	WITHDRAWN	University of Missouri	Plant Science	PhD	-

## PAPER PUBLICATIONS BY SCHOLARS

In spite of the challenges represented by a certain segment of the cohort, the completing scholars have shown a high level of academic productivity. Below are the peer reviewed articles published by Rwandan scholars through September 30, 2021, the closing date of the student portion of the BHEARD program.

STUDENT NAME	TITLE	AUTHORS	PUBLISHED IN	PUBLICATION DATE
1. Daniel NIYIKIZA	Interactions of gene expression, alternative splicing, and DNA methylation in the developing soybean nodules	Daniel Niyikiza, Sarbottam Piya, Pratyush Routray, Long Miao, Won-Seok Kim, Tessa Burch-Smith, Tom Gill, Carl Sams1, Prakash R. Arelli, Vince Pantalone, Hari B. Krishnan, and Tarek Hewezi	The Plant Journal	06/03/20

2. Herve Mwizerwa	Profiling of Microbial Content and Growth in Fermented Maize Based Products from Western Kenya.	Mwizerwa H, George Ooko Abong G. O, Mbugua S. K, Okoth M. W, Gacheru P, Muiru M, Obura B, Viljoen B.	Current Research in Nutrition and Food Science	12/01/17
3. Herve Mwizerwa	Effect of Resistant Cassava Starch on Quality Parameters and Sensory Attributes of Yoghurt.	Herve Mwizerwa, George Ooko Abong, Michael Wandayi Okoth, Martin Patrick Ongol, Calvin Onyango And Pushparajah Thavarajah	Current Research in Nutrition and Food Science	12/01/17
4. Richard HABIMANA	Genome-Wide Association Study of Growth Performance and Immune Response to Newcastle Disease Virus of Indigenous Chicken in Rwanda	Richard Habimana, Kiplangat Ngeno, Tobias Otieno Okeno, Claire D' andre Hirwa christian Keambou Tiambo and Nasser Kouadio Yao	Frontiers in Genetics	16 August 2021
5. Richard HABIMANA	Growth performance and immune response to Newcastle disease in four gene pools of indigenous chicken in Rwanda	Habimana, R., Ngeno, K., Shyaka, A., Ntawubizi, M., Mahoro, J., Hirwa, C. d'andre, Ingabire, A., Kiptui, L., Gafarasi, I. M. and Otieno, T. O.	Genetic Resources	29 December 2020
6. Richard HABIMANA	Morphobiometrical characteristics of indigenous chicken ecotype populations in Rwanda	<a href="#">R Habimana</a> , <a href="#">K Ngeno</a> , <a href="#">J Mahoro</a> 4, <a href="#">M Ntawubizi</a> , <a href="#">F Shumbusho</a> , <a href="#">M Manzi</a> , <a href="#">C A Hirwa</a> , <a href="#">T O Okeno</a>	Tropical Animal Health and Production	21 November 2020
7. Richard HABIMANA	Genetic diversity and population structure of indigenous chicken in Rwanda using microsatellite markers	Richard Habimana, Tobias Otieno Okeno, Kiplangat Ngeno, Sylvere Mboumba, Pauline Assami, Anique Ahou Gbotto, Christian Tiambo Keambou, Kizito Nishimwe, Janvier Mahoro, Nasser Yao	PloS One	2 April 2020
8. Dutuze Fausta	Comparative characterization of the reassortant Orthobunyavirus Ngari with putative parental viruses, Bunyamwera and Batai: in vitro characterization and ex vivo stability	M. Fausta Dutuze <sup>1,2</sup> , E. Handly Mayton <sup>1</sup> , Joshua D. Macaluso <sup>1</sup> and Rebecca C. Christofferson	Journal of general virology	12/01/20
9. Ayabagabo, Jean De Dieu	Mycotoxin Prevalence in Stored Animal Feeds and Ingredients in Rwanda	Kizito Nishimwe, Erin Bowers, Jean de Dieu Ayabagabo, Richard Habimana, Samuel Mutiga, Dirk E. Maier		10/07/18
10. Ayabagabo, Jean De Dieu	Assessment of Aflatoxin and Fumonisin Contamination and Associated Risk Factors in Feed and Feed Ingredients in Rwanda	Kizito Nishimwe, Erin Bowers, Jean de Dieu Ayabagabo, Richard Habimana, Samuel Mutiga, and Dirk Maier	toxins	05/04/19
11. Bigirimana, Joseph	Occurrence of Potato Taste Defect in Coffee and its Relations with Management Practices in Rwanda	Bigirimana, J., Adams, C.G., Gatarayiha, C.M., Muhutu, J.C., Gut, L.J.	Agriculture, Ecosystems & Environment	01/01/19



12. Bigirimana , Joseph	Options for managing Antestiopsis thunbergii (Hemiptera: Pentatomidae) and the relationship of bug density to the occurrence of potato taste defect in coffee	Bigirimana, Joseph ; Gerard, Andrew ; Mota-Sanchez, David ; Gut, Larry J	The Florida Entomologist	12/01/18
13. Bigirimana , Joseph	Population Distribution and Density of Antestiopsis Thunbergii (Hemiptera: Pentatomidae) in the Coffee Growing Regions of Rwanda in Relation to Climatic Variables	Joseph Bigirimana, Bellancile Uzayisenga, and Larry J. Gut	Crop Protection	05/04/19
14. Bigirimana , Joseph	Mitigating Antestia Bug Damage and the Potato Taste Defect in Rwandan Coffee	Andrew Gerard & Joseph Bigirimana		06/02/18
15. Byukusenge, Maurice	Complete Genome Sequences of Four Bovine Coronavirus Isolates from Pennsylvania	Maurice Byukusenge, Ruth Helmus Nissly, Sunitha Manjari Kasibhatla, Lingling Li, Rebekah Russell, Hayley Springer, Rhiannon Barry, Robert Van Saun, David Wolfgang, Ernest Hovingh, Urmilla Kulkarni-Kale, and Suresh V. Kuchipudi	American Society for Microbiology	05/31/18
16. Byukusenge, Maurice	Whole-Genome Sequences of 18 Bovine Alpha herpesvirus 1 Field Isolates from Pennsylvania and Minnesota	Chothe, Shubhada K.; Aswathy, Sebastian; Thomas, Asha; Nissly, Ruth; and Byukusenge, Maurice	American Society for Microbiology	04/01/18
17. Byukusenge, Maurice	Comparison between Rose Bengal Plate Test and Competitive Enzyme Linked Immunosorbent Assay to Detect Bovine Brucellosis in Kigali City, Rwanda	Manishimwe, Rosine; Ntaganda, Julius; Habimana, Richard; Nishimwe, Kizito; Byukusenge, Maurice; Dutuze, Fausta; Ayabagabo, Jean de Dieu; Lydia, Umurerwa; Rukundo, Jean Claude	Journal of Dairy, Veterinary & Animal Research	11/16/15
18. Byukusenge, Maurice	Erratum: Complete genome sequences of four bovine coronavirus isolates from Pennsylvania	Maurice Byukusenge, Ruth Helmus Nissly, Sunitha Manjari Kasibhatla, Lingling Li, Rebekah Russell, Hayley Springer, Rhiannon Barry, Robert Van Saun, David Wolfgang, Ernest Hovingh, Urmila Kulkarni-Kale, Suresh V. Kuchipudi	American Society for Microbiology	07/19/18
19. Byukusenge, Maurice	Whole-genome sequence analysis reveals unique SNP profiles to distinguish vaccine and wild-type strains of bovine herpesvirus-1 (BoHV-1)	Chothe, S.K., Sebastian, A., Thomas, A., Nissly, R.H., Wolfgang, D., Byukusenge, M., Mor, S.K., Goyal, S.M., Albert, I., Tewar, D., Jayarao, B.M., Kuchipudi, S.V.	Virology	09/01/18

20. Byukusenge, Maurice	Complete Genome Sequences of 20 Nontyphoidal Salmonella Isolates from Rwanda	Maurice Byukusenge, Lingling Li, Mediatrice Uwanyirigira, Venkata R. Vepachedu, Subhashinie Kariyawasam, Manassé Nzayirambaho, Suresh V. Kuchipudi, Bhushan M. Jayarao	American Society for Microbiology	03/21/19
21. Dutuze, Marie Fausta	A Review of Bunyamwera, Batai, and Ngari Viruses: Understudied Orthobunyaviruses With Potential One Health Implications	M. Fausta Dutuze, Manassé Nzayirambaho, Christopher N. Mores, and Rebecca C. Christofferson	Frontiers in Veterinary Science	04/12/18
22. Dutuze, Marie Fausta	Tissue tropisms, infection kinetics, histologic lesions, and antibody response of the MR766 strain of Zika virus in a murine model	Anna B. Kawiecki, E. Handly Mayton, M. Fausta Dutuze, Brad A. Goupil, Ingeborg M. Langohr, Fabio Del Piero, and Rebecca C. Christofferson	Virology Journal	04/18/17
23. Dutuze, Marie Fausta	Perception of Animal Welfare by Students of Cheikh Anta Diop University of Dakar	M.F. Dutuze, A.R.I. Garba, R. Manishimwe, P. Kone	Journal of Tropical Livestock Science	01/20/16
24. Habimana, Richard	Mycotoxin Prevalence in Stored Animal Feeds and Ingredients in Rwanda	Kizito Nishimwe, Erin Bowers, Jean de Dieu Ayabagabo, Richard Habimana, Samuel Mutiga, Dirk E. Maier		10/07/18
25. Habimana, Richard	Model African Union: Experiential Pedagogical Approach to Teaching One Health in Veterinary Medicine and Public Health	Florence Wakoko-Studstill, Margaret Loy Khaitisa, Samuel George Okech, John Baligwamunsi Kaneene, Patrick Pithua, Sherry Blackmon, Haiden Rogers, Gertrude Shepelo, Muasya Daniel Wambua, Erick Komba, Richard Samson, Tsegay Tkue Gebrewahde, Richard Habimana, Andrew Kibogo, Viola Kasonev, Augustus Okite, Watson Aijuka, John David Kabasa	The Pan African Medical Journal	08/26/17
26. Habimana, Richard	Characterization of Indigenous Chicken Production Systems in Rwanda	J. Mahoro, T.K. Muasya, F. Mbuza, R. Habimana, A.K. Kahi	Poultry Science	09/14/17
27. Habimana, Richard	Assessment of Aflatoxin and Fumonisin Contamination and Associated Risk Factors in Feed and Feed Ingredients in Rwanda	Kizito Nishimwe, Erin Bowers, Jean De Dieu Ayabagabo, Richard Habimana, Samuel Mutiga, and Dirk Maier	toxins	05/14/19
28. Kamatenesi, Jovia	Complete Sequence and Diversity of a Maize-Associated Poliovirus in East Africa	Deogracious P. Massawe, Lucy R. Stewart, Jovia Kamatenesi,	Virus Genes	04/23/18

		Theodore Asiimwe, and Margaret G. Redinbaugh		
29. Manishimwe, Rosine	Assessment of Antibiotic Use in Farm Animals in Rwanda	Rosine Manishimwe, Kizito Nishimwe and Lonzy Ojok	Tropical Animal Health and Production	05/19/17
30. Manishimwe, Rosine	Characterization of Antibiotic Resistant Escherichia coli in Different Poultry Farming Systems in the Eastern Province and Kigali City of Rwanda	R. Manishimwe, M. Buhire, A. Uyisunze, J. B. Turikumwenayo, M. Tukei	Veterinary Science & Technology	09/20/17
31. Manishimwe, Rosine	Characterization of Broiler Poultry Production System in Rwanda	Francis Mbuza, Rosine Manishimwe, Janvier Mahoro, Thomas Simbankabo, and Kizito Nishimwe	Tropical Animal Health and Production	10/11/16
32. Manishimwe, Rosine	Higher Education Resource Services, East Africa: A Women Leadership and Management Development Model	Margaret Loy Khaitisa, Naomi Watasa Lumutenga, Ruth Muwazi, Florence Wakoko-Studstill, Irene Naigaga, May Sengendo, Consolata Kabonesa, Wanjiku Kabira, Joy Mueni Maina Kiiru, Katherine Kanabahita, Frances Nyachwo, Mary Okwakol, Catherine Wandera, Kifle Tsegabirhant, Tesfu Hailu Frehiwot, Katunzi-Mollet Kokuberwa, Judith Samwel Kahamba, Angele Musabyimana, Rosine Manishimwe, Marie Bigendako, Renovate Irambona	The Pan African Medical Journal	08/25/17
33. Mazimpaka, Eugene	Current status of cattle production system in Nyagatare District-Rwanda	Mazimpaka, E., Mbuza, F., Michael, T., Gatari, E.N., Bukenya, E.M., James, O.-A.	Tropical Animal Health and Production	08/19/17
34. Mazimpaka, Eugene	Poultry production and constraints in Eastern Province of Rwanda: case study of Rukomo sector, Nyagatare district	Mazimpaka, E., Tukei, M., Shyaka, A., Gatari, E.N.	Tropical Animal Health and Production	04/01/18
35. Mbarushimana Jean de Dieu	Effect of inorganic fertilizers and planting density on growth and yield of selected maize varieties in eastern Rwanda	Jean de Dieu Mbarushimana, Josiah Mwivandi Kinama, George Ndiema Chemining'wa	International Journal of Agronomy and Agricultural Research (IJAAAR)	11/06/18
36. Mpatswenumugabo, Jean Pierre	Field Validation of Clinical and Laboratory Diagnosis of Wildebeest Associated Malignant Catarrhal Fever in Cattle	Sheillah Ayiela Orono, George Chege Gitao, Jean Pierre Mpatswenumugabo, Maurine Chepkwony, Christine Mutisya, Edward Okoth, Barend Mark de	BMC Veterinary Research	02/28/19

		Clare Bronsvort, George Cameron Russell, Vishvanath Nene and Elizabeth Anne Jessie Cook		
37. Mpatswenumugabo, Jean Pierre	Prevalence of Subclinical Mastitis and Distribution of Pathogens in Dairy Farms of Rubavu and Nyabihu Districts, Rwanda	J. P. Mpatswenumugabo, L. C. Bebora, G. C. Gitao, V. A. Mobegi, B. Iraguha, O. Kamana, and B. Shumbusho	Journal of Veterinary Medicine	07/17/17
38. Mwizerwa, Herve	Profiling of microbial content and growth in fermented maize based products from Western Kenya	Mwizerwa, H., Abong, G.O., Mbugua, S.K., Okoth, M.W., Gacheru, P., Muiru, M., Obura, B., Viljoen, B.	Current Research in Nutrition and Food Science	08/01/18
39. Mwizerwa, Herve	Effect of resistant cassava starch on quality parameters and sensory attributes of yoghurt	Mwizerwa, H., Abong, G.O., Okoth, M.W., Ongol, M.P., Onyango, C., Thavarajah, P.	Current Research in Nutrition and Food Science	12/01/17
40. Ndayitegeye, Olivier	Evaluation of CROPWAT 8.0 model in predicting the yield of east Africa highland banana under different sets of irrigation scheduling	Olivier Ndayitegeye, Japheth Ogalo Onyando, Romulus Okoth Okwany and Johnson Kisera Kwach	<a href="http://www.f2ffoundation.org/faa/2020/08/16/evaluation-of-cropwat-8-0-model-in-predicting-the-yield-of-east-africa-highland-banana-under-different-sets-of-irrigation-scheduling/">http://www.f2ffoundation.org/faa/2020/08/16/evaluation-of-cropwat-8-0-model-in-predicting-the-yield-of-east-africa-highland-banana-under-different-sets-of-irrigation-scheduling/</a>	08/16/20
41. Ndayitegeye, Olivier	Vegetative growth of banana as influenced by deficit irrigation and irrigation interval	Olivier Ndayitegeye, Japheth Ogalo Onyando, Romulus Okoth Okwany, Johnson Kisera Kwach	<a href="http://www.f2ffoundation.org/faa/2019/12/07/vegetative-growth-of-banana-as-influenced-by-deficit-irrigation-and-irrigation-interval/">http://www.f2ffoundation.org/faa/2019/12/07/vegetative-growth-of-banana-as-influenced-by-deficit-irrigation-and-irrigation-interval/</a>	12/07/19
42. Ndereyimana, Assinapol	Growth, yield and fruit quality of tomato under different integrated management options against Tuta absoluta Meyrick	Assinapol Ndereyimana, Samuel Nyalala, Patrick Murerwa, Svetlana Gaidashova	Advances in Horticultural Science	04/21/20
43. Ndereyimana, Assinapol	Field efficacy of entomopathogens and plant extracts on Tuta absoluta Meyrick (Lepidoptera: Gelechiidae) infesting tomato in Rwanda	Assinapol Ndereyimana, Samuel Nyalala, Patrick Murerwa, Svetlana Gaidashova	Crop Protection	04/21/20

44. Ndereyim ana, Assinapol	Bioactivity of plant extracts against tomato leaf miner, <i>Tuta absoluta</i> (Meyrick) (Lepidoptera: Gelechiidae)	Assinapol Ndereyimana, Samuel Nyalala, Patrick Murerwa, Svetlanan Gaidashova	Journal of Applied Horticulture	12/01/19
45. Ndereyim ana, Assinapol	Pathogenicity of some commercial formulations of entomopathogenic fungi on the tomato leaf miner, <i>Tuta absoluta</i> (Meyrick) (Lepidoptera: Gelechiidae)	Assinapol Ndereyimana, Samuel Nyalala, Patrick Murerwa, Svetlana Gaidashova	Egyptian Journal of Biological Pest Control	11/18/19
46. Ndereyim ana, Assinapol	Potential of entomopathogenic nematode isolates from Rwanda to control the tomato leaf miner, <i>Tuta absoluta</i> (Meyrick) (Lepidoptera: Gelechiidae)	Assinapol Ndereyimana, Samuel Nyalala, Patrick Murerwa, Svetlana Gaidashova	Egyptian Journal of Biological pest Control	08/27/19
47. Ndereyim ana, Assinapol	Eco-Efficiency of Tomato from Rwamagana District in Rwanda: From Field Constraints to Statistical Significance	Claudine Basset-Mens, Béatrice Rhino, Assinapol Ndereyimana, Ulrich Kleih, Yannick Biardae	Journal of Cleaner Production	05/03/19
48. Nishimwe, Kizito	Mycotoxin Prevalence in Stored Animal Feeds and Ingredients in Rwanda	Kizito Nishimwe, Erin Bowers, Jean de Dieu Ayabagabo, Richard Habimana, Samuel Mutiga, Dirk E. Maier		10/07/18
49. Nishimwe, Kizito	Assessment of Antibiotic Use in Farm Animals in Rwanda	Rosine Manishimwe, Kizito Nishimwe and Lonzy Ojok	Tropical Animal Health and Production	05/19/17
50. Nishimwe, Kizito	Characterization of Broiler Poultry Production System in Rwanda	Francis Mbuza, Rosine Manishimwe, Janvier Mahoro, Thomas Simbankabo, and Kizito Nishimwe	Tropical Animal Health and Production	10/11/16
51. Nishimwe, Kizito	An Initial Characterization of Aflatoxin B1 Contamination of Maize Sold in the Principal Retail Markets of Kigali, Rwanda	Kizito Nishimwe, Immaculate Wanjuki, Charles Karangwa, Ross Darnell, Jagger Harvey	Food Control	09/05/16
52. Nishimwe, Kizito	Assessment of Aflatoxin and Fumonisin Contamination and Associated Risk Factors in Feed and Feed Ingredients in Rwanda	Kizito Nishimwe, Erin Bowers, Jean De Dieu Ayabagabo, Richard Habimana, Samuel Mutiga, and Dirk Maier	toxins	05/14/19
53. Ntampaka , Pie	Knowledge, attitudes and practices regarding rabies and its control among dog owners in Kigali city, Rwanda	Ntampaka, Pie; Nyaga, Philip Njeru; Gathumbi, James Kinuthia; Tukei, Michael; Niragire, François.	Cold Spring Harbor Laboratory Press	12/18/18
54. Shingiro, Jean-Bosco	Fermentation and germination improve nutritional value of cereals and legumes through activation of endogenous enzymes	Smith G. Nkata, Emmanuel Ayua, Elijah H. Kamau, and Jean-Bosco Shingiro	Food Science & Nutrition	09/21/18

55. Uwituze, Chantal	Effect of Mulch Types and Mineral Fertilizer Rates on Cabbage ( <i>Brassica Oleracea</i> var. <i>Capitata</i> ) Growth and Yield in the Highlands of Rwanda	"Chantal Uwituze, Hamudu Rukangantambara <sup>1</sup> and Joyce J. Lelei <sup>2</sup>	International Journal of Plant & Soil Science	07/26/17
56. Uwizeyimana, Dieudonne	Effect of water conservation measures on soil moisture and maize yield under drought prone agro-ecological zones in Rwanda	Uwizeyimana, Dieudonne; Kironchi, Geoffrey; Karuku, George; Mureithi, Stephen M.	International Soil and Water Conservation Research	09/01/18
57. Uwizeyimana, Dieudonne	Modelling surface runoff using the soil conservation service-curve number method in a drought prone agro-ecological zone in Rwanda	Uwizeyimana, D., Mureithi, S.M., Mvuyekure, S.M., Karuku, G., Kironchi, G.	International Soil and Water Conservation Research	12/19/18
58. Waweru, Bancy	Molecular Detection of Ugandan Passiflora Virus Infecting Passionfruit ( <i>Passiflora edulis</i> Sims) in Rwanda	W. Waweru Bancy, C. Kilalo Dora, Kyalo Martina, and J. Musembi Mutuku	Annual Research & Review in Biology	01/16/19
59. Waweru, Bancy	Management of White Grubs ( <i>Coleoptera:Scarabaeidae</i> ) with Entomopathogenic Nematodes in Rwanda	Joelle Kajuga, Athanase Hategekimana, Xun Yan, Bancy Waithira Waweru, Hongmei Li, Kebin Li, Jiao Yin, Li Cao, Daniel Karanja, Christine Umulisa, and Stefen Toepfer	Egyptian Journal of Biological Pest Control	01/30/18
60. Waweru, Bancy	Research progress report from July to September 2018	Bancy Waithira Waweru		
61. Waweru, Bancy	Diversity and economic importance of viral diseases of pepper ( <i>Capsicum</i> spp.) in Eastern Africa	"B.W. Waweru, D.C. Kilalo, D.W. Miano, J.W. Kimenju and P. Rukundo"	Journal of Applied Horticulture	
62. Pascal Nyabinwa	Effects of endometritis on reproductive performance of zero-grazed dairy cows on smallholder farms in Rwanda	Pascal Nyabinwa, Olivier Basole Kashongwe, Claire d'Andre Hirwa, Bockline Omedo Bebe	Animal Reproduction Science	08/27/20
63. Rosine Manishimwe	Antibiotic resistance among <i>Escherichia coli</i> and <i>Salmonella</i> isolated from dairy cattle feces in Texas	Rosine Manishimwe, Paola M. Moncada, Marie Bugarel, H. Morgan Scott, Guy H. Loneragan	PLOS ONE	05/21/21
64. Bancy Waithira Waweru	Farmers' knowledge and perceptions of virus diseases affecting hot pepper ( <i>Capsicum</i> sp.) and their management in Rwanda.	Waweru B.W., Kilalo D.C., Kimenju J.W., Rukundo P. and Miano D.W.	Fundamental and Applied Agriculture	08/16/20
65. Bancy Waithira Waweru	Evaluation of hot pepper ( <i>Capsicum</i> spp.) genotypes for resistance to viruses and aphids in Rwanda.	Waweru B.W., Kilalo D.C., Kimenju J.W., Rukundo P. and Miano D.W.	Advances in Horticultural Science	10/23/20
66. Bancy Waithira Waweru	Effect of border crops and intercropping on aphid infestation and the associated viral diseases in hot pepper ( <i>Capsicum</i> sp.).	Waweru, B.W, Rukundo, P., Kilalo, D.C, Miano, D.W and Kimenju, J.W	Crop Protection Journal	07/01/21

67. Bancy Waithira Waweru	Detection and distribution of viruses infecting hot pepper ( <i>Capsicum</i> spp.) in Rwanda.	Waweru, B.W., Miano, D.W., Kilalo, D.C., Rukundo P and Kimenju, J.W	Journal of Plant Pathology	03/15/21
68. Rosine Manishimwe	Antibiotic-Resistant <i>Escherichia coli</i> and <i>Salmonella</i> from the Feces of Food Animals in the East Province of Rwanda	Rosine Manishimwe, Paola M. Moncada, Vestine Musanayire, Anselme Shyaka, H. Morgan Scott, Guy H. Loneragan	Animals	04/03/21

## *South Sudan*

### Activity Summary

BHEARD sponsored 35 South Sudanese scholars, 25 successfully completed their program and went back home after completion of their degree programs. Within the 25, eight are from Cohort 1, five from Cohort 2, seven from Cohort 5 and five from Cohort 6. Fifteen of the scholars who started under the BHEARD program were passed off, with the assistance of a Mission buy-in, to the Feed the Future Innovation Lab for Legume Systems Research. Of these 15, twelve completed their programs after the pass off. Three were withdrawn from the program for lack of compliance.

### Successes

The incorporation of six students from the closing InnovATE program at Virginia Tech University into the BHEARD program presented opportunities for both programs. All but one of the InnovATE scholars were able to successfully complete their programs under the BHEARD program. Overall, the contribution to the human research capital of Sudan was significant through the BHEARD program.

### Challenges

COVID restrictions, especially at Kenyan universities, added a layer of complication to an already complicated support of the South Sudanese scholars. Ten scholars withdrew or were withdrawn from the program (Cohort 1: 2 scholars, Cohort 2: 4 scholars and Cohort 5: 4 scholars were suspended from the program due to violations of Contract of Sponsorship (2), Low academic grades (2) and not completing within the timeline (4).



*Daniel Ajuong, a BHEARD scholar on field trip at Kenya Agricultural and livestock Research Organisation (KALRO) at Njoro food crops centre*



*Dr. Dominique Gore in the laboratory conducting semen analysis in the Bull Semen Center under Agricultural Development Corporation in Kitale, Kenya*



Yensuk Achikule during the briefing of enumerators for data collection in Kikuyu Sub- County, Kiambu County in central Kenya on 30th/01/2019.



John Alosias and Emmanuel Atiba, BHEARD scholars and 2 staff from the research station at Virginia State University during the Graduation ceremony on 12/12/2015

### List of All Scholars

Below is the list of all South Sudanese sponsored students and their current status.

NAME (first and last)	SEXE	COHORT	STUDENT STATUS	UNIVERSITY	SUBJECT AREA	ACADEMIC LEVEL	GRADUATION YEAR
1. Awuol, Chol	M	Cohort 6	Completed	University of Nairobi	Agronomy	MSC	
2. Magot, Michael	M	Cohort 6	Completed	University of Nairobi	Agricultural Economics	MSC	
3. Majok, Dan	M	Cohort 6	Completed	University of Nairobi	Agricultural Economics	MSC	FY21
4. Samuel, Stephen Edward	M	Cohort 6	Completed	University of Nairobi	Agricultural Entomology	MSC	-
5. Ajak, Peter	M	Cohort 5	Completed	University of Nairobi	Livestock Production	MSC	FY21
6. Ajuong, Daniel	M	Cohort 5	Completed	University of Nairobi	Plant Pathology	MSC	
7. Elia, Moi	M	Cohort 5	Completed	University of Nairobi	Agronomy	MSC	
8. Gore, Dominic	M	Cohort 5	Completed	Egerton University	Animal Sciences	PhD	FY21
9. James, Robert Okumu	M	Cohort 5	Completed	University of Nairobi	Agricultural Economics	MSC	
10. Lobojo, Doris	F	Cohort 5	Withdrawn	University of Nairobi	Veterinary Epidemiology & Economics	MSC	
11. Thiong, Abraham	M	Cohort 5	Completed	University of Nairobi	Livestock Production Systems	MSC	FY21



12. Victor, Tarbal	M	Cohort 5	Completed	University of Nairobi	Animal Production	MSC	FY21
13. Yensuk, Achikule	M	Cohort 5	Completed	University of Nairobi	Livestock Production Systems	MSC	FY21
14. Lasu, Gloria	F	Cohort 5	Withdrawn	Egerton University	Horticulture	MSC	
15. Wani, Lubajo	M	Cohort 5	Completed	University of Nairobi	Land and Water Management	MSC	
16. Ware, Joyce	F	Cohort 5	Withdrawn	University of Nairobi	Veterinary Public Health	MSC	
17. Ocaya, Aryemo	M	Cohort 5	Withdrawn	University of Nairobi	Agronomy	MSC	
18. Deng, Mamer John	M	Cohort 2	Completed	Egerton University	Animal Nutrition	MSC	FY17
19. Garang, Manyok John	M	Cohort 2	Completed	Egerton University	Environmental Science	MSC	FY17
20. Kok, Majok Ayuen	M	Cohort 2	Completed	Egerton University	Agronomy	MSC	FY17
21. Mangara, John Loro	M	Cohort 2	Completed	Egerton University	Animal Science (Nutritional Physiology)	PhD	FY18
22. Sila, Sabri Joshua	M	Cohort 2	Completed	Egerton University	Agricultural Engineering (Irrigation)	PhD	
23. Anyang, Thon Chol	M	Cohort 2	Withdrawn	Egerton University	Limnology	MSC	-
24. Malual, Aduol Athuai	M	Cohort 2	Withdrawn	Egerton University	Soil Science	MSC	-
25. Nicola, Saman Nicola	M	Cohort 2	Withdrawn	University of Nairobi	Environmental and Biosystems Engineering	MSC	-
26. Riak, Ayor Elizabeth	F	Cohort 2	Withdrawn	Egerton University	Agronomy	MSC	-
27. Abin, Samuel	M	Cohort 1	Completed	University of Pretoria	Animal Science: Animal Breeding and Genetics	MSC	FY15
28. Alosias, John	M	Cohort 1	Completed	Virginia State University	Interdisciplinary Studies	MSC	FY16
29. Atiba, Emmanuel	M	Cohort 1	Completed	Virginia State University	Interdisciplinary Studies	MSC	FY16
30. Bilal, Ruba	M	Cohort 1	Completed	Virginia Tech	Forestry	PhD	FY17
31. Gore, Dominic	M	Cohort 1	Completed	University of Pretoria	Animal Science, Production Physiology	MSC	FY16
32. Sebit, Martin	M	Cohort 1	Completed	Virginia Tech	Agriculture and Extension Ed	PhD	FY17

33. Talamuk, Raphael	M	Cohort 1	Completed	Stellenbosch University	Agriculture	MSC	FY16
34. Lado, Flora	F	Cohort 1	Withdrawn	Virginia Tech	Mining and Minerals Engineering	PhD	-
35. Wura, Majango	M	Cohort 1	Withdrawn	Virginia Tech	Fisheries and Wildlife	PhD	-

### Paper Publications by Scholars

The publication rate for South Sudanese scholars was quite low compared to other countries. South Sudan, however, had proportionally more MSc (as opposed to PhD) students than most other countries. Masters programs tend to focus less on publishing as a requirement for graduation, meaning that one would expect a diminished publishing record from these students. Below are the peer reviewed publications by South Sudanese scholars available at the time of the closing of the BHEARD scholars program in September of 2021.

STUDENT NAME	TITLE	AUTHORS	PUBLISHED IN	PUBLICATION DATE
1. Dominic Lado Marino Gore	Short-term oestrous synchronisation protocol following single fixed-time artificial insemination and natural mating as alternative to long-term protocol in dairy goats	D.L.M. Gore, J. N. Mburu, T.O. Okeno, T. K. Muasya	Small Ruminant Research	07/31/20
2. Dominic Lado Marino Gore	Comparative reproductive performance of Saanen and Toggenburg bucks raised under tropical environment	D.L.M. Gore, T.K. Muasya, T.O. Okeno, J.N. Mburu	Tropical Animal Health and Production	05/27/20
3. Dominic Lado Marino Gore	Short-term oestrous synchronisation protocol following single fixed-time artificial insemination and natural mating as alternative to long-term protocol in dairy goats	D.L.M. Gore, J.N. Mburu, T.O. Okeno, T.K. Muasya	Small Ruminant Research	07/31/20
4. Dominic Lado Marino Gore	Comparative reproductive performance of Saanen and Toggenburg bucks raised under tropical environment	D.L.M. Gore, T.K. Muasya, T.O. Okeno, J.N. Mburu	Tropical Animal Health and Production	05/27/20
5. Tarbal Daniel Comboni Victor	Evaluation Of Genes Associated With Mastitis In Crossbred Dairy Cattle	Daniel. CV. Tarbal, Joseph. O. Jung'a and Rawlynce. C. Bett	International Journal of Agriculture and Environmental Research (ijaer)	04/01/20
6. Tarbal Daniel Comboni Victor	Relationship between California mastitis test scores and somatic cell counts in different crossbred dairy cattle genotypes	Daniel. CV. Tarbal, Joseph. O. Jung'a and Rawlynce. C. Bett	International Journal of Environment and Agriculture Research (IJOEAR)	05/27/20
7. Abin, Samuel	Population structure and genetic trends for indigenous African beef cattle breeds in South Africa	S Abin, HE Theron, E van Marle-Köster	South African Bureau for Scientific Publications	

8. Abin, Samuel	Comparative performance of dairy cows in low-input smallholder and high-input production systems in South Africa	Abin, S., Banga, C. B., Visser, C.	Tropical Animal Health and Production	03/28/18
9. Atiba, Emmanuel	Meat Quality Characteristics of Goat ( <i>Capra hircus</i> ) Artificially Infected with <i>Haemonchus contortus</i> and Fed High and Low Protein Diets	Emmanuel M. Atiba, Vitalis W. Temu, Milton M. Lado, Brian Sayre	Science Letters	12/15/16
10. Atiba, Emmanuel	Effects of Dietary Protein Supplementation on the Performance and Non-Carcass Components of Goats Artificially Infected with <i>Haemonchus contortus</i>	Emmanuel M. Atiba, Brian Sayre, Vitalis W. Temu	Science Letters	06/25/16
11. Bilal, Ruba	Soil CO <sub>2</sub> efflux and water use efficiency across diverse cover types in southern Appalachian hardwood forests	Bilal, Ruba C.; Seiler, John R.; Strahm, Brian D.; Peterson, John A	United States Department of Agriculture	
12. Kok, Majok Ayuen	Effect of sowing date on grain quality of Sorghum ( <i>Sorghum Bicolor</i> L. Moench) in the Nile Corridor agroecological zone of South Sudan	Kok, M.A., Ouma, J.P.A., Ojwang, P.P.O.	African Journal of Food, Agriculture, Nutrition, and Development	11/01/17
13. Ocaya, Aryemo	How Canadian Feminism Can Improve Lives Globally	Aryemo Sunday Ocaya	The Toronto Star	08/15/18
14. Sebit, Martin	Learning Through Story: Using Narrative Inquiry in a Graduate-Level Food Security Course	Dr. Kim Niewolny, Rebecca Landis, Garland Mason, Dr. Philip D'Adamo-Damery, Robert Bass, Dana Hogg, Amanda McGee, Shreya Mitra, Oladayo Omosa, Martin Sebit, Asha Shayo, Emily Sorensen, Elli Travis, and Lily Yang		06/16/15
15. Majok Ayuen Kok	Sowing date influence on performance and yield of sorghum ( <i>Sorghum bicolor</i> L. Moench ) in the Nile Corridor region of South Sudan	Kok M.A.G, Ouma J. P and P. O. O Ojwang	Research Journal of Agriculture	10/01/16
16. Majok Ayuen	Effect of sowing date on yield and grain quality of sorghum ( <i>Sorghum bicolor</i> L. Moench ) in the Nile Corridor region of South Sudan	Kok M. A, Ouma J. P and P. O Ojwang	African Journal of Food, Agriculture, Nutrition and Development.	10/01/17

## *Uganda*

### 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 Uganda. BHEARD has provided scholarships to students seeking masters and doctorate degrees at US and regional academic institutions and has provided funding for agricultural research in their home countries. The program also developed, tested, and evaluated new models of small-scale institutional capacity development. BHEARD sponsored 10 scholars from Uganda, 9 successfully completed their program and went back to their home institutions after completion of their degree program.

### Successes

The strong relationship between the Kansas State University and Makerere University has served as the core of this program. The support that the Department of Agricultural Economics at KSU has been able to give to the Department of Agriculture and Natural Resource Economics at Makerere University has been invaluable. The support given by the BHEARD program has made possible the opening of a PhD program in the DANRE department.

### Challenges

One scholar failed candidacy and was terminated from the BHEARD program. Other than that, the Ugandan cohort did not meet with any particular difficulties in successfully completing their programs.

### List of All Scholars

Below is the complete list of Ugandan BHEARD scholars.

NAME (first and last)	SEX	COHORT	STUDENT STATUS	UNIVERSITY	SUBJECT AREA	ACADEMIC LEVEL	GRADUATION YEAR
1. Aseete, Paul	M	COHORT 5	COMPLETED	Kansas State University	Agricultural Economics	PhD	FY21
2. Nalunga, Asha	F	COHORT 5	COMPLETED	Kansas State University	Agricultural Economics	PhD	FY21
3. Lwiza, Florence	F	COHORT 4	COMPLETED	Kansas State University	Agricultural Economics	PhD	FY20
4. Bukenya, Richard	M	COHORT 1	COMPLETED	University of Illinois, Urbana-Champaign	Nutritional Sciences	PhD	FY17
5. Dramadri, Isaac Onziga	M	COHORT 1	COMPLETED	Michigan State University	Plant, Soil and Microbial Sciences	PhD	FY18
6. Male, Denis	M	COHORT 1	COMPLETED	Michigan State University	Food Science	PhD	FY18

7. Mugabi, Robert	M	COHORT 1	COMPLETED	University of Nebraska, Lincoln	Food Science and Technology	PhD	FY17
8. Ninsiima, Daniel	M	COHORT 1	COMPLETED	Michigan State University	Telecommunication, Information Studies, and Media	MSc	FY16
9. Sserunkuma, Herbert	M	COHORT 1	COMPLETED	University of Nebraska, Lincoln	Plant Breeding and Genetics	MSc	FY16
10. Kagoya, Sarah	F	COHORT 1	WITHDRAWN	Louisiana State University	Agricultural Economics and Agribusiness	PhD	FY21

### PAPER PUBLICATIONS BY SCHOLARS

The following peer reviewed publications were submitted by Ugandan scholars. This list represents accomplishments of Ugandan BHEARD scholars through September 2021, the end-date of the scholar program. The Ugandan scholar cohort had one of the highest publication rates of any BHEARD country (2.0 publications per student).

STUDENT NAME	TITLE	AUTHORS	PUBLISHED IN	PUBLICATION DATE
1. Aseete, Paul	Consumer Demand Heterogeneity and Valuation of Value-Added Pulse Products: A case of Precooked Beans in Uganda	Paul Aseete, Enid Katungi, Jackline Bonabana-Wabbi, Eliud Birachi, and Michael Adrogu Ugen	Agriculture & Food Security	07/28/18
2. Bukenya, Richard	Validity and Reliability of General Nutrition Knowledge Questionnaire for Adults in Uganda	Bukenya, R., Ahmed, A., Andrade, J.M., Grigsby-Toussaint, D.S., Muyonga, J., Andrade, J.E.	Nutrients; Basel	02/21/17
3. Bukenya, Richard	Assessing the reliability of FTIR spectroscopy measurements and validity of bioelectrical impedance analysis as a surrogate measure of body composition among children and adolescents aged 8-19 years attending schools in Kampala, Uganda	Ndagire, C.T., Muyonga, J.H., Isabirye, D., Odur, B., Somda, S.M.A. Bukenya, R., Andrade, J.E., Nakimbugwe, D.	BMC Public Health; London	06/04/18
4. Dramadri, Isaac Onziga	Identification of QTL Associated with Drought Tolerance in Andean Common Bean	Isaac Dramadri Onziga, Stanley T. Nkalubo, and James D. Kelly	Crop Science	03/21/19
5. Lwiza, Florence	Dis-Adoption of Household Biogas Technologies in Central Uganda	Florence Lwiza, Johnny Mushiga, Peter N. Walekhwa, Jo Smith, and Bedru Balana	Energy for Sustainable Development	01/25/17
6. Male, Denis	Modeling the emetic potencies of food-borne trichothecenes by benchmark dose methodology	Male, D., Wu, W., Mitchell, N.J., Bursian, S., Pestka, J.J., Wu, F.	Food and Chemical Toxicology	08/01/16

7. Male, Denis	Modelling the anorectic potencies of food-borne trichothecenes by benchmark dose and incremental area under the curve methodology	Male, D., Mitchell, N.J., Wu, W., Bursian, S., Pestka, J., Wu, F.	World Mycotoxin Journal	12/21/15
8. Male, Denis	Reduced foodborne toxin exposure is a benefit of improving dietary diversity.	Wu, Felicia; Mitchell, Nicole J; Male, Denis; Kensler, Thomas W	Toxicological Sciences: An Official Journal of the Society of Toxicology	10/01/14
9. Male, Denis	Influence of Food Safety Knowledge, Attitudes and Practices of Processors on Microbiological Quality of Commercially Produced Traditional Fermented Cereal Beverages, A Case of Obushera in Kampala	Stellah Byakika, Ivan Muzira Mukisa, Yusuf Byenkya Byaruhanga, Denis Male, and Charles Muyanja	Food Control	01/24/19
10. Mugabi, Robert	In-store drying as an alternative for corn drying in Uganda	Mugabi, R., Driscoll, R.	American Society of Agricultural and Biological Engineers	07/26/15
11. Mugabi, Robert	Performance Evaluation of Locally Fabricated Hammer Mills in Rural Uganda: Crafting a Test Protocol	Mugabi, R., Byaruhanga, Y.B., Weller, C.L.	American Society of Agricultural and Biological Engineers	07/26/15
12. Mugabi, Robert	Study of Maize Drying in Uganda Using an in-Store Dryer Weather Data Simulation Software	Robert Mugabi and Robert Driscoll	International Journal of Food Processing Technology	02/18/16
13. Mugabi, Robert	Comparison of Experimental Designs Used to Study Variables During Hammer Milling of Corn Bean	R. Mugabi, K.M. Eskridge, C.L. Weller	American Society of Agricultural and Biological Engineers	12/01/16
14. Mugabi, Robert	Challenges Faced by Small-Scale Local Fabricators and Millers in Uganda: A Case Study of Hammer Mill Fabricators and Users	Robert Mugabi, Yusuf B. Byaruhanga, and Curtis L. Weller	Journal of Advances in Food Science & Technology	09/01/18
15. Nalunga, Asha	The Dynamics of Household Labor Allocation to Biogas Production, Farm and Non-Farm Activities in Central Uganda	Asha Nalunga, Johnny Mugisha, Peter Walekhwa, and Jo Smith	Renewable Energy	04/30/19
16. Ninsiima, Daniel	"Buuza Omulimisa" (Ask the extension officer): Text Messaging for Low Literate Farming Communities in Rural Uganda	Ninsiima, D.	Association for Computing Machinery	05/05/15
17. Paul Aseete	SPATIOTEMPORAL EVALUATION OF DRY BEANS AND GROUNDNUT PRODUCTION TECHNOLOGY AND INEFFICIENCY IN GHANA	Francis Tsiboe Paul Aseete Justice G Djokoto	Review of Agricultural and Applied Economics	02/28/21

18. Paul Aseete	Allocation of farm output and farmer-agribusiness linkages: Cyclical decisions and welfare effects	Paul Aseete	K-REx	03/24/21
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