

Research Application Summary

**Borlaug Higher Education for Agricultural Research Development (BHEARD)
programme develops human and institutional capacity in Africa**

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Abstract

It has been estimated that by 2050, the world's global population will grow to around 9.7 billion, and that the world food supply must double to adequately feed this population. Even today, a significant portion of the world population experiences food insecurity, primarily in developing countries. Feed the Future is the US government's global hunger and food security initiative that supports country driven approaches to address the root causes of hunger and poverty. The Borlaug Higher Education for Agricultural Research and Development (BHEARD) programme, a human and institutional capacity development programme, is part of Feed the Future. BHEARD takes a holistic approach to human and institutional capacity building by training employees of specific agricultural institutions that have been identified as meeting the priorities of each USAID and host government responses to the Feed the Future programme. BHEARD has identified a number of creative solutions to perennial challenges related to degree training, such as how to ensure that the trainees return to their home countries and institutions after graduation, and how to ensure that the degree research is relevant to the needs of the home country. BHEARD also has a commitment to institutional capacity development with the partner institutions from which we draw our students. A final area of focus is the challenge of creating an active community of researchers among those who complete the BHEARD programme.

Key words: Agricultural research, food security, human and institutional capacity development

Résumé

Il a été estimé que d'ici 2050, la population mondiale dans le monde passera à environ 9,7 milliards, et que l'approvisionnement alimentaire mondiale doit doubler pour nourrir adéquatement cette population. Aujourd'hui encore, une partie importante de la population mondiale connaît l'insécurité alimentaire, principalement dans les pays en développement. Feed the Future est une initiative globale du gouvernement des Etats Unis d'Amérique sur la faim et la sécurité alimentaire qui soutient les approches du pays à traiter les causes

profondes de la faim et de la pauvreté. Le programme d'enseignement supérieur Borlaug pour le développement (BHEARD) et la recherche agricole, est un programme de développement institutionnel des capacités humaines qui fait partie de Feed the Future. BHEARD adopte une approche holistique du renforcement des capacités humaines et institutionnelles par la formation des employés des institutions agricoles spécifiques qui ont été identifiés comme répondant aux priorités de chaque USAID et les réponses du gouvernement hôte du programme futur. BHEARD a identifié un certain nombre de solutions créatives aux défis perpétuels liés à la formation diplômant, comme la façon de s'assurer que les stagiaires retournent dans leur pays et dans leurs institutions mères après l'obtention du diplôme, et comment faire en sorte que la formation diplômant soit pertinente pour répondre aux besoins du pays d'origine. BHEARD s'est également engagé pour assurer le développement des capacités institutionnelles avec les institutions partenaires d'où proviennent nos étudiants. Un dernier domaine d'intérêt est le défi de créer une communauté active de chercheurs parmi ceux qui ont terminé le programme de BHEARD.

Mots clés: recherche agricole, la sécurité alimentaire, le développement humain et des capacités institutionnelles

Introduction

It has been estimated that in the first half of this century the world's global population will grow to around 9.7 billion (United Nations, Department of economic and social affairs, population division, 2015). Africa is the fastest growing area, and more than half of global population growth between now and 2015 is expected to occur in Africa with approximately 1.3 billion people to be added in this region. Asia is projected to have the second largest growth area adding approximately 1 billion people between now and 2050 (United Nations, Department of economic and social affairs, population division, 2015). In order to feed the human population in 2050, the world's food supply has to be doubled (Alexandratos and Bruinsma, 2012). This increase in food supply will have to occur in the context of climate change, urban sprawl, civil strife, and the need for maintaining natural habitats. To meet these challenges, new technologies will be needed to grow more food with less land and under challenging climatic conditions (Alexandratos and Bruinsma, 2012). Even today it is estimated that about 795 million of the 7.3 billion people in the world are food insecure. Most of the food insecurity occurs in developing countries, with 90% of the food insecurity in Asia and Africa. In sub-Saharan Africa, approximately 23% of the population is estimated to be under nourished, the highest prevalence of food insecurity for any region of the world (FAO, IFAD, and WFP, 2015). Considering the expected world population growth especially in Africa, together with the current African food insecurity, it is clear that major advances in agriculture are needed to adequately feed the world population going forward. Feed the Future (FTF) is the US government's global hunger and food security initiative that supports country driven approaches to address the root causes of hunger and poverty (Feed The Future Progress Report, 2015). BHEARD, a human and institutional capacity development programme is part of Feed the Future. The BHEARD programme is based on the premise that *"A strong and empowered cadre of scientists and researchers with professional skills and extensive high-level knowledge—and effective home institutions where these*

Fifth RUFORUM Biennial Regional Conference 17 - 21 October 2016, Cape Town, South Africa 143
professionals work—are needed for developing and adapting of innovations suited to local contexts and are most likely to drive long-term productivity and development and to build resilient systems that can respond to change.” BHEARD RFA 2012

The BHEARD programme has the following objectives:

- (i) Develop the scientific capacity (both human and institutional) of FTF countries based on strategic analysis of institutional and national capability to address the FTF goals of agriculture-led growth and reduction of hunger.
- (ii) Create strong and supportive linkages between the scientific and higher education communities across Africa and in the United States in order to achieve FTF goals.
- (iii) Encourage and identify innovative and effective mechanisms for human and institutional capacity development through focused monitoring, evaluation and analysis.
- (iv) Create an efficient implementing entity through which USAID missions and bureaus can easily conduct capacity building activities with low transaction costs.

The purpose of this paper is to describe the strategies used by BHEARD to meet these objectives.

Design of BHEARD’s long-term degree training programme

The design of BHEARD’s long-term degree training programme is based on recommendations by Gilboy (Gilboy *et al.*, 2010). These recommendations are in italics below, followed by a description of how BHEARD is following these recommendations.

Using the HICD approach, focus on the African institution’s performance improvement rather than training African individuals out of context (as was often done earlier in

Table 1. BHEARD data at a glance

Countries participating *	11
Partner institutions	44
PhD candidates	81
MS candidates	67
Total scholars	148
Areas of study	15
Institutional capacity development projects	5
US University partners	23
African University partners	8
Brazilian University partners	2



*Bangladesh; Cambodia; Ghana; Kenya; Liberia; Malawi; Mali; Mozambique; Rwanda; South Sudan; Uganda

the “Best and Brightest” programmes). Fund graduate training for employees of African institutions, not outstanding students from the general public.

With the support of the USAID missions, BHEARD scholars are selected from target institution employees or those student with a reasonable expectation of future employment by those institutions, rather than individuals without connections to target institutions.

Establish clear links between the U.S. degree programme and specific institutional (not just individual) performance gaps that will be addressed by the training.

BHEARD works closely with target institution leaders and USAID missions to identify specific institutional performance gaps that will be addressed by training. These performance gaps vary greatly by institutions, and this is reflected in specific areas of study identified as priority areas for each participating country (Table 2).

Require that graduate research topics be jointly developed by and with African institutions and U.S. advisors, and that research be conducted in Africa.

Table 2. BHEARD scholars’ topics of study

Agricultural Economics or Agribusiness (including Agricultural Statistics, Data Analysis or Policy Planning)

Agronomy or Crop Science (including Crop Physiology)

Animal or Livestock Sciences (including Animal Nutrition or Physiology)

Biological Systems Engineering (including Environmental or Ecological)

Biotechnology

Entomology (including Integrated Pest Management)

Fisheries or Aquaculture

Food Science and Nutrition (including Food Safety or Technology)

Horticulture

Plant Breeding and Genetics (including Molecular Biology and Biotechnology)

Plant Pathology (including Virology)

Resource Management (including Land, Water and Irrigation)

Rural Sociology

Soil Science

Sustainable Agriculture or Sustainability

The BHEARD programme requires that each BHEARD scholar has a U.S. advisor as well as an in-country advisor. Through this mechanism, graduate research topics are jointly developed by target institutions and U.S. advisors, and approved by the USAID mission and the home institution. BHEARD also requires that research is conducted in-country, or in case of security issues (South Sudan) in the region.

Promote partnerships between U.S. and African institutions in tandem with providing support for training of carefully-selected faculty and staff.

The BHEARD programme has several features encouraging partnership development between U.S. and target institutions. These features include joint design of the dissertation research, funding for U.S. advisors to visit target institutions, and the requirement for an in-country advisor.

Ensure that the selection criteria for candidates for U.S. degrees include leadership potential and the level of the employee's commitment to apply the new knowledge and skills acquired upon return.

During the selection process, particularly during the interview, the BHEARD team spends a great deal of effort gauging the level of leadership potential, and commitment of employees to return home and apply new knowledge and skills to strengthen the institution and the country's food security.

Identify the need for Masters and PhD degrees according to employment realities and institutional need, not according to a student's ability to migrate to a higher degree.

The need for Master's and PhD degrees is determined in discussions with the institution and the USAID missions.

Require that African participants in U.S. degree programmes be placed only at U.S. institutions with strong ongoing programmes in Africa to ensure that leverage in sustained, long-term capacity building stretches beyond an individual student's programme and USAID's five-year project windows.

Through an open Request for Application (RFA) process, BHEARD sends student portfolios to about 50 U.S. institutions, and most BHEARD training candidates have more than one placement option. A team of USAID scientists recommends the best match between the prospective student and the U.S. institution in part based on the existence of ongoing programmes in the target country. The USAID country mission has the final say in student placement, in consultation with the home institution of the student.

Design "sandwich" training programmes that combine U.S. and African study and research experiences to avoid selection of research topics not directly related to home country needs and to minimize long absences from the home institution and family.

The BHEARD training programme combines coursework and the development of research methodology in the US, with dissertation research conducted in country. This ensures that the research topic is relevant to the home country, and minimizes long absences from the home institution and family.

The advantages and disadvantages of BHEARD approach to long term degree training. There are many different models of long-term PhD degree training, each with their advantages and disadvantages. BHEARD has primarily utilized the Coursework in the U.S., Research in Africa, and Degree from the U.S. model, and USAID missions and target institutions have enthusiastically supported this model of PhD training. However, the BHEARD team, in consultation with USAID and target institutions, has developed several new approaches to trainee placement and management.

Innovative training strategies

Model 1: Trainees Take More Responsibilities for Their Own Placement. In Ghana, we have experimented with the premise that students' active involvement in their own university placement results in better placements, with more appropriate advisors, and with less work for the BHEARD management office.

Model 2: Mozambican Trainees to Study in Brazil and in Mozambique. This model addresses the specific needs of Mozambican trainees, very few of whom possess the required English proficiency to study in an English-medium university. We have recruited students who are able to secure admission to good master's programmes in Brazil or in Mozambique.

Model 3: Combination of Taught and Research PhD at WACCI. BHEARD introduced another innovation in training delivery in 2016, when our first Liberian joined the PhD programme at the West African Center for Crop Improvement (WACCI) at the University of Ghana, Legon. This programme provides one year of intensive course work, followed by three years of appropriate research work in one or more regional institutions.

Model 4: Sandwich Programmes for Makerere University, with Degree Awarded by Makerere. A new institutional capacity development activity with the Department of Agricultural and Natural Resource Economics (DANRE) at Makerere University provided an exciting opportunity to develop a model thus far not used by BHEARD. As part of this project, BHEARD will provide one or two semesters of coursework at a selected U.S. university to complement the training of DANRE staff who are already registered for the research PhD at Makerere. All training will be in the field of agricultural economics/agricultural policy, and research methodology.

Model 5: Recruitment of Trainees for Completion of Degree. BHEARD will provide training to a Rwandan who had already completed his first year of master's training at Makerere University at his own expense, and had to drop out due to lack of funds. This is an extremely easy and cost effective model of training to take on, and we will continue to look for these opportunities among future applicants.

Model 6: Planning for Collaboration with African Centers of Excellence Institutions. A long-term goal for BHEARD is to place our trainees in the African Centers of Excellence programmes that may provide exceptional training for our trainees. These centers will strengthen post-graduate programmes, offer specialized courses for professionals, improve

and attract top-level faculty, provide learning resources and labs, establish linkages with companies, government agencies and research centers, and collaborate with partner institutions to share the benefits of investments.

BHEARD approach to gender issues

As gender is a cross-cutting theme within Feed the Future, BHEARD emphasized this issue in all interactions with the various stakeholders and during the selection process. For example, BHEARD uses its connections in target countries to encourage women to apply to the programme, and age limits are extended for women applicants.

A final area of focus is the challenge of creating an active community of researchers among those who complete the BHEARD programme.

BHEARD's role in institutional capacity development

“While BHEARD is primarily a long-term degree (MSc and PhD), agriculture and food security training programme supporting the goals of agriculture-led growth and poverty reduction, it is also a platform both for the developing, testing, and evaluating of new models of capacity development and for shared learning on best approaches to training in the context of institutional development.” (BHEARD RFA). Accordingly, we have launched five programmes to support direct strengthening of the agricultural research organizations from which BHEARD fellows are being trained. These programmes are:

1. Capacity Development for Goat Value Chain Improvement in Liberia
2. Capacity Development for Agricultural Policy in Uganda
3. Research Technician Training Programme in Ghana
4. Capacity Development in Data Collection, Management, and Analysis in Mali
5. Research Grant Writing Development for the Rwanda Agricultural Board

A large comprehensive institutional capacity building programme has been established with Makerere University's Department of Agricultural and Natural Resource Economics (DANRE). This three-year project involves doctoral training of faculty members, including sandwich programmes for those studying at Makerere; upgrading of the agricultural economics curriculum at Makerere; development of long-term linkages between DANRE faculty and faculty of the U.S. university chosen to implement this project.

These projects are designed according to the USAID seven-step HICD process including: 1) identifying partner organizations; 2) obtaining partner commitment; 3) forming stakeholder groups; 4) conducting performance assessments; 5) prepare project; 6) implement project, and 7) monitor change in performance. In our presentation, the *Capacity Development for Goat Value Chain Improvement in Liberia* project will be used as an example of project development and implementation.

Acknowledgement

This paper is a contribution to the 2016 Fifth African Higher Education Week and RUFORUM Biennial Conference.

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