

**Annual Report**  
**Harvard School of Public Health (HSPH)**  
**Year 3 (201-2013)**  
**Feed the Future Innovation Lab for Collaborative Research on**  
**Nutrition-Africa**

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## **Map or List of Countries Where Work is Being Conducted**

Uganda

## **List of Program Partners**

Makerere University, Uganda

## **Acronyms**

BBNC Bangalore Boston Nutrition Collaborative

FtF Feed the Future

HSPH Harvard School of Public Health

ME Management Entity

NIL Feed the Future Innovation Lab for Collaborative Research on Nutrition

UCCP Uganda Community Connector Project

## **I) Executive Summary**

In Year 3, Harvard School of Public Health (HSPH) strengthened its collaboration with Makerere University and broadened its research agenda in Uganda. HSPH research activities in Uganda are closely linked to evaluation of USAID's Uganda Community Connector Project (UCCP). During the project year, a panel study was initiated in northern and southwestern Uganda to evaluate the impact of UCCP on household livelihoods and maternal and child nutritional outcomes, and detailed planning began on a birth cohort study to study the mechanisms by which UCCP impacts these outcomes. Capacity-building efforts were integrated into research activities, with additional training opportunities for Ugandan students and researchers provided through the Bangalore Boston Nutrition Collaborative (BBNC) and at HSPH.

## **II) Program Activities and Highlights**

HSPH, in collaboration with Makerere University and Tufts University, began implementation of the NIL Uganda Panel Study in rural districts of northern and southwestern Uganda, with completion of the study baseline and dissemination of key Feed the Future (FtF) indicators and early findings through meetings and symposia. Training and capacity building for Ugandan scientists were integrated into research activities in Uganda as well as provided through short courses internationally.

## **III) Key Accomplishments**

The baseline for the Uganda Panel Study was completed during Year 3. Specific accomplishments included obtaining of institutional approvals; development and testing of data collection tools and an electronic data collection application; training of supervisors and field staff; sampling of households; rapid and timely collection of baseline data; data cleaning; and calculation and dissemination of key FtF indicators and additional indicators requested by UCCP. Early findings from the baseline have been disseminated to USAID, UCCP, district leaders and officials, and other stakeholders through meetings, a research symposium, and presentations and discussions in each participating district. Significant planning has also been done for the Uganda Birth Cohort Study, which is scheduled to begin in the coming project year.

## **IV) Research Program Overview and Structure**

HSPH research studies in Uganda are linked to the evaluation of the UCCP. All research is conducted in close collaboration with Makerere University and the ME. Effort is made to include training and active involvement of junior staff in research activities to build capacity in research on agriculture, nutrition, and health linkages.

## **V) Research Project Reports**

### **a) Research linked to evaluation of the UCCP**

#### **i) Uganda Panel Study**

NIL's Uganda Panel Study, conducted as a collaborative effort among HSPH, Makerere University, and the ME, aims to evaluate the impact of UCCP on household livelihoods and maternal and child nutritional status. The panel study collects representative data from households in randomly-selected districts initiating UCCP activities at varying stages of UCCP's scaling-up plan, thereby creating a natural experiment for evaluating UCCP. Achievements during the project year included obtaining of institutional approvals; development and testing of data collection tools and an electronic data collection application; training of supervisors and field staff; sampling of households; rapid and timely collection of baseline data; data cleaning; and calculation and dissemination of key FtF

indicators and additional indicators requested by UCCP. Early findings from the baseline have been disseminated to USAID, UCCP, district leaders and officials, and other stakeholders through meetings, a research symposium in June 2013, and presentations and discussions in each participating district in August 2013. These findings are being prepared as scientific manuscripts to be submitted for publication in the peer-reviewed literature. Baseline implementation also yielded lessons learned on specific data collection modules and methods for electronic data collection that will inform future data collection.

**ii) Uganda Birth Cohort Study**

NIL's Uganda Birth Cohort Study, also a collaborative effort among HPSH, Makerere University, and the ME, will examine the effect of interventions that integrate nutrition, health, agriculture, and livelihoods on maternal and child nutritional outcomes. Compared with the panel study, the cohort study will use a wider range of nutritional outcomes including biochemical measures and specifically study exposure to UCCP, uptake of its interventions, and mechanisms by which these impact maternal and child nutritional status. Study protocol and tools are being finalized, and the study is scheduled to begin in the coming project year.

**VI) Associate Award Research Project Reports**

HSPH was not involved in Associate Awards in Africa.

**VII) Human and Institutional Capacity Development**

**a) Training by Country**

**i) Short-Term**

Christopher Duggan served as Program Director and faculty member for the Bangalore Boston Nutrition Collaborative (BBNC) short course on nutrition research methods in January 2013. This course was attended by trainees from Uganda and Nepal who were supported by NIL, among others. Trainees receive two weeks of intensive training on research methods in international nutrition from faculty drawn from Harvard University, St. John's Research Institute, and Tufts University.

One trainee, Mr. Julius Twinamasiko, from Makerere University, attended the Summer Session for Public Health Studies at HSPH in July-August 2013. He took four intensive courses on epidemiology, biostatistics, and health policy under mentorship from HPSH NIL faculty, complementing his prior training in agricultural economics and providing a strong foundation for future interdisciplinary research and study on agriculture, nutrition, and health linkages.

**ii) Long-Term**

HSPH did not have long-term trainees during the project year.

**b) Institutional Development**

**i) Description**

Supervisors and field staff involved in the panel study received training on agriculture, nutrition, and health linkages as well as key related areas such as sanitation and hygiene, infant and young child feeding practices, and intra-household gender dynamics prior to data collection. Practical training included the use of tablets for electronic data collection,

anthropometric assessment of adults and children, malaria diagnosis, and field assessment of anemia. Some panel study staff have continued engagement with NIL through attending the BBNC short course or the Summer Session for Public Health Studies at HSPH or by contributing to analyses of collected panel data. Dissemination of panel methods and findings to USAID, UCCP, and other stakeholders, students at Ugandan institutions, and leaders and officials in participating districts have also contributed to NIL's capacity-building objectives in Uganda.

**ii) Partners**

Partners in training and dissemination activities include Makerere University and Tufts University (ME).

**VIII) Technology Transfer and Scaling Partnerships**

NIL is not involved in technology development, transfer, or scaling.

**IX) Governance and Management Entity Activity**

Wafaie Fawzi continued his role on the Board of Directors, and Christopher Duggan continued his role on the Technical Advisory Committee during the project year.

**X) Other Topics**

None to report.

**XI) Issues**

None to report.

**XII) Future Directions**

HSPH will continue to expand its activities in Uganda in Year 4. Research will be conducted on agriculture, nutrition, and health linkages using panel data collected in Year 3. The multiyear Birth Cohort Study will begin, allowing detailed investigation of mechanisms by which integrated interventions impact maternal and child nutritional outcomes. Capacity building will continue to be integrated into research activities, while additional training opportunities will be offered through BBNC and at HSPH in Boston.

**Annual Report**  
***Purdue University***  
***Year 3 (2012-2013)***  
***Feed the Future Nutrition Innovation Lab-Africa***

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**Objective 1 (as stated in Year 2 Work Plan): Research**

- Understand and measure the connections between agricultural capacity, technology adoption, nutrition outcomes, and conditioning factors at levels of aggregation ranging from household to district levels. The key objective is to develop an empirically-based and data-driven understanding of the overlap between agricultural issues and health/nutrition issues in Uganda, so as to improve the effectiveness of nutrition policy in Uganda.

*Substantial progress achieved, as detailed below.*

**Objective 2 (as stated in Year 2 Work Plan): Data Analysis and Data Collection**

- Analyze data collected in Years 1 and 2 in six villages of Western Uganda. The questionnaire extends a panel (with earlier rounds in 2003 and 2007) with new information on cooking technology, meal response to fuel price changes and health impacts (primarily respiratory disease). In July/August 2012 we collected stored food samples (cassava, maize and groundnuts) from more than 300 farm households and used rapid qualitative tests to measure the presence of aflatoxin at levels above recommended amounts. This provides a baseline for the early post-harvest period. We will complement these data by collecting another round of samples for food storage in Year 3. We will also conduct aflatoxin tests on products obtained in the market, using similar methods.

*Substantial progress achieved on first activity; market-level aflatoxin testing was not undertaken (see below).*

### **Objective 3 (as stated in Year 2 Work Plan): Capacity Building**

- Increase the capacity and effectiveness of research institutions in Uganda, especially in the College of Agriculture at Makerere University. Train students at the graduate level to become contributing members of the global community fighting against hunger and malnutrition.

*Activities initiated, as detailed below.*

### **Introduction/Overview of Work Plan Rationale/Objectives**

Uganda faces a number of development challenges, including chronic and widespread child malnutrition. Current knowledge and national capacity to address these challenges is insufficient. This Work Plan focuses on studying available evidence regarding food security, malnutrition and related topics in Uganda and to undertake primary research and data collection to fill knowledge gaps on key issues related to agriculture, health and nutrition, and to simultaneously engage in training to improve knowledge and capacity in Uganda. Research and capacity building are being undertaken in a manner that aims to be synergistic with USAID “Community Connector” goals and objectives. Activities are closely aligned with the Feed-the-Future orientation of delivering “Purpose-Driven Research” by: (1) directly addressing socio-behavioral, economic and market factors related to technology and practice adoption; (2) targeting efforts in areas where the poor and malnourished are concentrated; and (3) transforming production systems to ensure enhanced food safety and nutrition.

### **Section I: Research Activities**

#### **Focal Area: *Identification of Priority Research Areas***

Activity 1: These activities were completed in Years 1 and 2.

#### **Focal Area: *Synthesis of Existing Programs and Projects***

Activity 2: In Year 3 we completed these activities. We obtained existing socioeconomic datasets for Uganda, including datasets with possible nutrition components for subsequent analysis or follow-on data collection. We secured access to a number of datasets, including multiple rounds of the Uganda National Household Survey (UNHS), Uganda Demographic and Health Survey (DHS) data, and remotely-sensed satellite data (maximum value Advanced Very High Resolution Radiometer (AVHRR) Normalized Difference Vegetation Index (NDVI) composites from the NASA Global Inventory Monitoring and Modeling Systems (GIMMS) group at NASA's Biospheric Sciences Branch). We have supplemented these data with agricultural commodity price data from Uganda with both spatial and temporal resolution. This multi-layered dataset is being analyzed and preliminary findings are being reported in a series of working papers. This research was part of a student MS thesis completed at Purdue in Year 3. It also constitutes the ongoing focus of a PhD student.

### ***Focal Area: Discrete Socio-Economic Analysis***

Activity 3: In Year 3 we made substantial progress on several fronts and have achieved momentum on analysis and writing. Although it was not part of the original Year 1 Work Plan, during Year 1 we capitalized on an opportunity to leverage USAID BASIS AMA financial resources to collect survey data in six villages of Western Uganda. The survey was used to extend a household panel (with earlier rounds in 2003 and 2007) adding new information on cooking technology, meal response to fuel price changes and health impacts (primarily respiratory disease). Leveraging these data to measure health and nutrition interactions in the face of rising fuel prices and associated changes in household cooking behavior provides insights into an understudied aspect of nutrition in Uganda, in particular as it impinges on home preparation of infant-weaning foods. Activities undertaken directly address food quantity and quality concerns as articulated in the Feed-the-Future program. They also place agricultural production and household decision making within a larger context that spans biophysical, policy and social elements of household health and nutrition production systems. During Year 3 we continued to analyze these data, including an additional round of data collected in 2012.

### ***Lessons Learned and Challenges in Implementing Proposed Activities***

Delays in initial approval and launch of the project created impediments to project start-up, but these have mostly been overcome.

### ***Solutions/Resolutions Applied or to be Applied***

We remain committed to integrating all of our activities with the ME and the mission.

## **Section II: Capacity Building Activities**

### **Focal area: *Degree Training***

Activities: Considerable effort was devoted to identifying a student from Uganda for degree training at Purdue University. One student secured admission to the PhD program in Agricultural Economics at Purdue. George Omiat began his PhD training in August 2012 and is currently a student in good standing. Mr. Omiat was formerly a junior faculty member at Makerere University, and has been granted leave from that institution to complete his studies in the US. It is expected that upon completion, he will be absorbed back into the teaching/research faculty at Makerere.

### ***Lessons Learned and Challenges in Implementing Proposed Activities***

Identifying well-prepared Ugandan candidates for graduate degree training in the US was a significant early challenge. From a logistical point of view, it would have been desirable to train several MS students under the project, but early project delays and the substantial investment in student recruitment, screening and processing has meant that we are likely to train a single student at the PhD level. The student has been processed through TraiNet, and we have made a commitment to funding the student as part of the Nutrition CRSP project. Hence it is essential that we maintain continuity of funding to support the student through the completion of his degree. If the NIL project ends before he completes his degree we may need to hold budget in reserve and explore options for a no-cost extension beyond 2015.

### ***Solutions/Resolutions Applied or to be Applied***

We anticipate seeking additional non-CRSP sources of follow-on funding for this student, as necessary, beyond 2015.

### **Outputs**

Jagger, P. and G. Shively (2013) "Land use change, fuel use and respiratory health in Uganda." Currently in review at *Energy Policy*. [Available in working paper format.]

Shively, G. and J. Hao (2013) "Agricultural Activity and Child Growth in Uganda." Draft.

Omiat, G. and G. Shively (2013) "Spatial and Vertical Price Transmission for Selected Commodities

and Markets in Uganda.” Working Paper. West Lafayette (IN), Purdue University Department of Agricultural Economics.

Brown, M., K. Grace, G. Shively, K. Johnson, and M. Carroll (2013) “Using Satellite Remote Sensing and Household Survey Data to Assess Human Health and Nutrition Response to Environmental Change.” Currently in review at *Population and Environment*. [Available in working paper format.]

### **Leveraging and Cost Sharing**

Overall external leveraging and cost-share contributions to the project were approximately \$69,253 or roughly 88% of the Year 2 Work Plan budget. During Year 3 we continue to work closely with Pam Jagger at the University of North Carolina, who has separate funding to support air-quality sampling in Uganda. We estimate that the NIL is leveraging approximately \$50,000 of non-NIL support in Year 3. This does not include the substantial leveraging that comes as part of our collaboration with Dr. Molly Brown at NASA to use remotely-sensed data. This collaboration represents leveraging of several hundred million dollars of past US investment in data collection.

### **Vignettes**

See Nepal report.

**Tuskegee University Annual Report for  
Feed the Future Innovation Labs for Collaboration Research (UGANDA PROJECT)**

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<sup>1</sup> U.S. universities and international partners by country.

<sup>2</sup> Summary of program activities for the year, no more than one page in length.

<sup>3</sup> Concise statement of achievements, limited to one page in length that focuses on outputs, not process, such as Feed the Future indicators and distillation of program achievements across all program activities. Reporting on numbers of project meetings is not an output.

<sup>4</sup> Summaries of project activities, highlights and outcomes, not scientific reports or long detailed research papers, no more than one page per project.

<sup>5</sup> Provide institutional affiliation and country.

<sup>6</sup> This section is to serve as a compilation of all program training activities and not meant to duplicate the Capacity Building section under individual Research Project Reports. It can be in chart format.

- i) Short-Term
  - (1) Number (by gender) **one female**
  - (2) Purpose: **hands-on training in food product development, food safety and sanitation applied to conditions in home country.**
  - (3) Home institution, if applicable: **Tuskegee University**
  - (4) Training institution or mechanism: **Food Science Department, Pennsylvania State University**
- ii) Long –Term
  - (1) Number (by gender): **3 males 2 females**
  - (2) Purpose: **to increase number of graduates in Food and Nutritional Sciences**
  - (3) Field/discipline: **Food Science, Nutrition,**
  - (4) Home institution: **Tuskegee University**
  - (5) Training Institution: **Makerere University**
  - (6) Number (by gender): **1 male**
  - (7) Purpose: **to increase number of graduates in Food and Nutritional Sciences**
  - (8) Field/discipline: **Nutrition**
  - (9) Home institution: **Makerere University**
  - (10) Training Institution: **Tuskegee University**
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#### Appendices

- A. List of awards given to U.S. universities to include project name, dates and funding (current year and total). Note if any are AANAPIS<sup>9</sup>, HBCU<sup>10</sup> and/or HSI<sup>11</sup>.
- B. Three distinct success stories<sup>12</sup>.

<sup>7</sup> Such as Regional Centers of Excellence, impact assessment, gender initiatives

<sup>8</sup> Such as financial, management, regulatory

<sup>9</sup> Asian American, Native American, Pacific Island Serving Institutions

<sup>10</sup> Historically Black Colleges and Universities

<sup>11</sup> Hispanic Serving Institutions

<sup>12</sup> Each should: a) be limited to 500 words, b) be results oriented, c) written in layman's terms, d) avoid acronyms, e) address Feed the Future priorities, and f) include a high resolution digital photo with caption and photo credit. It is okay to reference a website for more detailed information.

