



**Nutrition Collaborative Research Support Program**  
Nutrition CRSP – Africa

**Annual Report**  
**Fiscal Year 2012 (Year 2)**



Submitted by the  
Friedman School of Nutrition  
Tufts University  
Boston, MA

## **Nutrition Collaborative Research Support Program – Africa Annual Report 2011/12 (Fiscal Year 2012-Year 2)**

### **Foreword**

The mission of the Nutrition Collaborative Research Support Program-Africa (N/CRSP-Africa) is to discover how policy and program interventions can most effectively achieve large-scale improvements in maternal and child nutrition, particularly when leveraging food-based activities. N/CRSP-Africa emphasizes operationally relevant research that can support national governments across Africa in their attempts to improve nutrition, health, and agricultural productivity. The Management Entity (Tufts University) collaborates with a network of US University partners, including the Schools of Public Health at Harvard University and Johns Hopkins University, the College of Agriculture at Purdue University and the College of Agricultural, Environmental, and Natural Sciences at Tuskegee University. It also has formal partnerships with private sector entities (Development Alternatives, Inc.), and non-governmental agencies, including Makerere University in Uganda and IFPRI.

Program activities are funded under grant contract AID-OAA-L-1-00006 from the United States Agency for International Development (USAID).

#### **Nutrition CRSP - Africa**

Friedman School of Nutrition Science and Policy  
Tufts University  
150 Harrison Avenue  
Boston, MA 02111  
USA

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## **1. Introduction**

The Nutrition Collaborative Research Support Program for Africa (N/CRSP-Africa) represents a novel model for focusing US-supported research on food and nutrition issues in developing countries. This includes:

- A defined geographic focus ('deep-dive' research which is in line with Feed the Future (FtF) priority countries);
- An applied focus (operations research rather than discovery science);
- A focus on country-ownership (supporting research that informs nationally-defined priorities in food and nutrition);
- Resources allocated to large grants to work at scale (rather than many small grants supporting studies of experimental or pilot activities); and
- Building capacity for analysis and policy formulation through formal education activities as well as engagement of local partners at stages of the research agenda.

Tufts University's Friedman School of Nutrition Science and Policy has served as the Management Entity (ME) for the Nutrition Collaborative Research Support Program (N/CRSP) for Africa and Asia since October 2010. The Friedman School implements the N/CRSP in close partnership with several US university partners—Tuskegee University, Purdue University, Johns Hopkins University, and Harvard University—as well as Development Alternatives, Inc. Additional partnerships have been formed around the research and capacity-building agenda. These partnerships include governmental bodies, Nepali Universities, and non-governmental actors.

This report outlines achievements against the approved implementation plan for Year 2 (Y2), covering October 4, 2012 to October 3, 2013. Specific measurable goals laid out in the Y2 work plan are highlighted in boxes, along with the status of such goals (achieved or not) and details relating to achievements (or reasons for lack of achievement) are elaborated in the subsequent text.

## **2. Governance and Management Entity Activities**

This section focuses on the global activities led by Tufts University as N/CRSP Management Entity for both Asia and Africa. The synergies and cost-savings gained by having a single lead for both CRSP awards have proven to be substantial, allowing for effective cross-continent sharing of ideas among partners and the development of a central repository (website and workspace) for materials, papers, and reports relevant to N/CRSP activities globally.

## Summary of Y2 Outputs – Governance and Management

2.1	At least one BoD and one TAC meeting held before October 2012	- Achieved
2.2	Inactive members of BoD/TAC replaced	- Partly Achieved
2.3	Uganda Technical Advisory Committee established/meeting held	- Partly Achieved
2.4	Year 2 CRSP research funds awarded	- Achieved
2.5	Pre-“ <i>Lancet Series</i> ” workshop held in London before October 2012	- Achieved
2.6	Proceedings from <i>Lancet</i> workshop prepared for publication	- Achieved
2.7	N/CRSP website reviewed/updated	- Partly Achieved
2.8	Nutrition highlighted in CRSP Council/Knowledge Management outputs	- Achieved

### **2.1 At least one BoD and one TAC meeting held before October 2012 – Achieved.**

A formal meeting of the Global Nutrition CRSP Board of Directors (BoD) and its Technical Advisory Committee (TAC) was held in London in June 2012. Minutes of the meeting were posted to the N/CRSP website and shared with partners and are attached in Appendix 1. Several important resolutions were voted on and approved at those meetings including: i) engagement with the other CRSPs to ensure higher recognition of the importance of nutrition across all CRSP-related research activities; ii) the need to facilitate the thinking on appropriate metrics that measure value-added gains for nutrition through leveraging agriculture and other sectoral activities; iii) prioritization of N/CRSP capacity building toward appropriately-qualified nationals from government service in N/CRSP focus countries, as well as local academia, Think Tank institutions, national research centers, and appropriate non-governmental organizations; iv) procedures for selection of students supported by N/CRSP resources; and v) peer review and co-authorship principles relating to N/CRSP research outputs.

### **2.2 Inactive members of BoD/TAC replaced with appropriate new members – Partly Achieved**

As three members of the original Board had not attended any of the meetings in either Years 1 or 2, and had not contributed to the activities of the N/CRSP-Asia and N/CRSP-Africa, it was decided to drop these members (three people), and replace them with other qualified members. To date, one new member has been added (Mary Bassett, Doris Duke Foundation). In addition, the original USAID/Washington, DC AOR and alternate (Cheryl Jackson and Ellen Harris) both moved to other positions in the US government during Y2 and were replaced on the BoD and TAC by Maura Mack and Pascasie Adedze, preceded by an interim period replacement by Jennifer “Vern” Long. A list of BoD and TAC member is provided in Appendix 2.

For the record, the ME would like to express its thanks to Cheryl Jackson and Ellen Harris for the great effort they put into helping the Nutrition CRSP get off the ground, and to Vern Long for stepping in after their departure. The ME would also like to note that Maura and Pascasie have been wonderful successors, helping N/CRSP-Asia and N/CRSP-Africa become established in Uganda and Nepal, and garnering high-level interest globally.

### **2.3 Uganda Technical Advisory Committee (U-TAC) established/meeting held – Partially Achieved; full implementation delayed to FY 2013**

The N/CRSP-Africa Y2 work plan, approved in January 2012, outlined the intent to establish a formal Ugandan TAC with meetings in early-to-mid 2012, followed by one in late FY 2012. Individuals who might serve were identified in Y1 and early Y2. The identification of appropriate individuals and discussing the TAC with them were steps that were achieved in Y2.

However, FY 2012 was characterized by a number of unexpected leadership changes in Uganda: a governmental transfer of responsibility for nutrition coordination from the National Planning Authority to the Office of the President; a lack of knowledge as to where the Uganda Community Connector would be operating; and who the consortium partners would be. In sum, these factors argued for establishing the TAC after the operational and governmental changes were finalized. N/CRSP-Africa would like to highlight that its research agenda was presented publicly to stakeholders in March 2012 at a workshop organized and held in Jinja, Uganda. Events that impacted the N/CRSP's work in Y2 include:

- **Nature of interventions was unclear.** The Uganda Community Connector (UCC) was awarded in late December 2011. The UCC then had six months to develop a work plan. The UCC decided that the interventions would be tailored to each parish in the districts where they were working.
- **Sites were not known.** The actual districts where the UCC would be implemented during Phase I were not finalized until the late spring, and, for Phase II, not until September 2012. Thus, advice or suggestions relating to the specific district characteristics (population, disease burden, agricultural characteristics, ecology, infrastructure) could not have been easily obtained.
- **There was a change in the number of districts that would be studied and a change in which districts would participate.** The original assessment plan forwarded by USAID/Uganda included district data collection by the International Poverty Action (IPA) group as well as the N/CRSP-Africa. However, IPA dropped out of the data-collection process to pursue an independent agenda during April-May 2012, and the districts they are working in had to be separated from the ones where the N/CRSP-Africa would be working. This delayed decisions around which districts the N/CRSP-Africa would work in until the fourth quarter of FY2012. In addition, there was a change in which districts would participate (based on program assessment of willingness and ability to work in the district).
- **N/CRSP-Africa RFA Team leadership changed.** Y2 saw a change in leadership of the Uganda Team from Dr. Henry Wamani (Makerere School of Public Health), to Dr. Joyce Kikafunda (Department of Food Technology and Nutrition, Makerere School of Agriculture). After Professor Kikafunda assumed the leadership role, she was unexpectedly nominated to be the High Commissioner for Uganda to the UK by the President of Uganda. Professor Bernard Bashaasha, Dean of the School of Agriculture, next assumed the leadership role. Prof. Kikafunda has not yet been confirmed as High Commissioner and Professor Bashaasha is continuing to lead the core team (hereafter referred to as the RFA Team), a consortium of Makerere, Harvard, and Tufts universities, with substantial input from Professor Kikafunda. N/CRSP-Africa is now confident that either Professor Bashaasha or Professor Kikafunda will continue to lead the RFA Team. It is unlikely that the issue of Professor Kikafunda becoming the High Commissioner will be resolved until after January 1, 2013.

- **Government coordinating body changed.** National responsibility for advancing the nutrition agenda moved from the National Planning Authority (NPA) to the Office of the President (see: <http://opm.go.ug/departments/department-of-policy-coordination-monitoring-evaluation.html> for the announcement). Consequently, TAC membership should probably include persons from the Office of the President rather than the National Planning Authority.

During this period of uncertainty and changes in leadership, N/CRSP-Africa focused its efforts on supporting the development of research tools, building collaborations, and maintaining team cohesion. The N/CRSP-Africa recognizes the importance of a TAC and regrets the delay in its establishment. The Uganda TAC will be formulated in early FY 2013 now that the aforementioned issues have been resolved.

In preparation for the establishment of the TAC, the N/CRSP-Africa is organizing a high-level policy workshop with members of the Office of the President to be held in early FY 2013 (see Section 4, Uganda-Based Capacity Building).

#### **2.4 Year 2 research funds awarded – Achieved**

**Overview.** During Y2, N/CRSP-Africa focused on timely reporting (from its awardees and other partners, and from the N/CRSP Management Entity [ME] to USAID), and set in place mechanisms for quality oversight of financial systems and reporting among awardees in country. The Y2 funds were fully disbursed by USAID at the level originally anticipated. Most of those funds have been dedicated to supporting the field research agenda through an existing competitively bid RFA. Some relatively minor amounts of research funds were expended by the ME directly to pay for research supplies (sourced outside of Uganda) needed by the team in Uganda.

**USAID oversight.** At the suggestion of USAID (Cheryl Jackson), the final research team in Uganda was expanded to include Professors Joyce Kikafunda and Bernard Bashaasha. Their presence on the team enabled a necessary but essentially seamless change in leadership to occur on two occasions.

**Financial Management & Random Audit.** Financial and contractual management continued to be strengthened. The N/CRSP awards were randomly chosen for an audit by Tufts University during July/August 2012. The audit was successful.

**Associate Award - Malawi.** USAID/Malawi bought into the N/CRSP leader award with an Associate Award which enables the N/CRSP to provide technical assistance to Bunda Agricultural College; review and align the national curricula for medical and health professionals with national priorities; and support the development of accurate food composition tables for Malawi. The Malawi Work Plan is attached in Appendix 3. N/CRSP-Africa has submitted a research proposal to USAID/Malawi for discussion and potential buy-in from a group of interested partners (Appendix 4). N/CRSP-Africa hopes that its activities in Malawi will expand to include a specific research agenda. It continues to work with the USAID Assistance Officer's Representative (AOR) to engage with other Missions and address USAID priorities

#### **2.5 Pre-“Lancet Series” workshop held in London before October 2012 – Achieved**

As noted above, the BoD and TAC had promoted the idea that N/CRSP-Africa and N/CRSP-Asia should play a wider role in: a) broadening collaboration on issues around agriculture-nutrition linkages (beyond USAID-funded projects) to compare and draw lessons from empirical data collected in more than the two or three country case studies under the N/CRSP; b) establish broad demand for the kinds of research outputs to be expected from N/CRSP research; and c) initiate a process of consultations with non-CRSP researchers—all with a view to preparing a series of papers that could be bundled for publication in a high-visibility publication such as *The Lancet* (but not restricted to that one journal).

These aims were taken forward by establishing collaboration with the London School of Hygiene and Tropical Medicine's Leverhulme Centre for Integrative Research on Agriculture and Health (LCIRAH). A two-day workshop was jointly organized in London at the London School in June 2012, bringing together N/CRSP's core partners and a range of potential collaborators, including representatives of DFID, LCIRAH, the Institute for Development Studies, and the N/CRSP BoD and TAC. Presentations were made on a variety of multi-sector interventions that have nutrition goals and there was extensive discussion on study designs and analytical methods. It was a high caliber meeting that generated important ideas. The recommendations of the meeting were that the group should: a) meet again in 2013 to take the discussion forward, including updates on the programs presented, identification of new programs to add to the mix, and further elaboration on the issue of appropriate metrics for assessing the effectiveness of multi-sector programs and nutrition-sensitive interventions; and b) work collegially towards a series of linked papers for publication as a special issue of a to-be-identified publication (potentially *The Lancet*). As noted below, this meeting also led to a change in the research design for N/CRSP-Africa activities in Uganda, improving study rigor, demonstrating the value of this relationship.

#### **2.6 Proceedings from *Lancet* workshop prepared for publication – Achieved**

Subsequent to the meeting, a two-page workshop summary was prepared, with collective input from those present, and published on the LCIRAH website (appended as a Research Briefing). It is also being reformulated using the N/CRSP template and will be posted to the N/CRSP website. A second meeting was agreed upon for 2013, for which a more formal proceedings report will be prepared and published in the *Food and Nutrition Bulletin* (ideally by the end of 2013).

#### **2.7 N/CRSP website reviewed/updated – Partly Achieved**

The BoD and TAC agreed that while the existing N/CRSP website is functional, it needs to be updated more systematically and reviewed periodically to ensure that it meets partner needs and presents an appropriate 'face' to the public. As such, the ME has been collecting suggestions from partners and users for improvements and areas where corrections to current content need to be made. Some modifications have already been made, but others require more time. The ME will, in Y3, recruit part-time technical support to enhance the functionality and aesthetics of the site, as well as ensuring that the site is user-friendly.

#### **2.8 Nutrition highlighted in CRSP Council Knowledge Management outputs – Achieved**

The N/CRSPs have become active members of the CRSP Council, engaging with the other directors through frequent conference calls, ongoing email dialogue, and face-to-face meetings. The

N/CRSPs played an important role as part of the group of directors presenting to, and interviewed by, the six members of BIFAD’s external review of CRSP modalities—which led to a strongly pro-CRSP report being prepared by the review team for the Administrator of USAID. N/CRSP-Africa has also participated in periodic conference calls with senior USAID staff as part of the CRSP Council.

There has been extensive one-on-one interaction with several other CRSPs on substantive research agendas of common interest, such as on aflatoxins with the Peanut CRSP, on micronutrient issues with the Horticulture CRSP, on animal source protein issues with the Livestock and Climate Change CRSP, and on issues relating to fish production and consumption with the AquaFish CRSP. Details specific to N/CRSP-Africa will be discussed in Section 3, Uganda-Based Research.

Constructive engagement with the other CRSPs has led to a much higher profile for nutrition as part of the collective ‘knowledge management’ activity of the CRSP Council, which seeks a more coherent communication to the outside world of the goals and activities of CRSPs. As a result, a new all-CRSP website has been established, which clearly highlights nutrition as a core topic (relevant to each CRSP), as well as the N/CRSP as one of the 10 free standing entities. The quarterly CRSP Digest publication has also highlighted N/CRSP activities since it started in early 2012.

**3. Uganda-Based Research**

<u>Summary of Y2 Outputs – Uganda-Based Research</u>		
Each output is discussed after a brief review of our approach, events in Uganda which have altered the timing of outputs, improvements in study rigor, and new synergies with other BFS CRSPs.		
3.1	Research workshop for core partners	- Achieved
3.2	Development of research protocol and baseline characterization	- Achieved
3.3	Birth Cohort set up	- Partially Achieved
3.4	IRB Review for Panel Surveys	- Achieved
3.5	Stocktaking reviews/discrete studies defined and initiated	- Achieved x 3; - Partial Achieved x 1
3.6	Desk reviews leading to at least 4 working papers/briefs drafted	- Partially Achieved.
3.7	At least 3 presentations made on N/CRSP-Africa work at scientific meetings; 2 publications submitted or published (re-analysis GINA II, and initial results of baseline data collection	
		Presentations - Achieved
		Publications - Postponed

**Overview.** During Y2, N/CRSP-Africa interacted consistently with its core partners, the USAID/Uganda Mission, and other groups including the Community Connector Implementation Team headed by FHI360. N/CRSP-Africa has also interacted with other groups, such as universities, and a variety of governmental bodies and agencies at both the central and district levels. The N/CRSP-Africa ‘Research Approach’ including data collection in Uganda, is outlined in the following pages.

In addition to funding the RFA Team for research, N/CRSP-Africa has also funded half of an IFPRI post-doctoral position (for Dr. Nassul Kabunga) and a district-level mapping exercise (conducted by Edgar Agaba). N/CRSP- Africa has funded the research of a Gulu University faculty member, Barnabas Natamba, who is investigating food insecurity, prenatal nutrition, and psychosocial health outcomes in pregnant women in Gulu. (This research is being used for his PhD from Cornell University. He is also in discussion with the N/CRSP on setting up a nutrition research and teaching unit at Gulu University). N/CRSP-Africa has also supported a curriculum review and research projects by seven MSc and MPH students at Makerere University.

### **Research Approach: Overview, timing of data collection, power, and collaborations**

N/CRSP-Africa shares a common overarching approach with N/CRSP-Asia, although the circumstances differ somewhat. The N/CRSP-Africa has, and will be, mainly focused on the processes and effects of one major program, the Uganda Community Connector (UCC) project funded by the Uganda Mission. This focus on a single major implementation project differs from the approach in Nepal, where N/CRSP-Asia has identified 21 districts which are served by a variety of programs, with three districts selected for enhanced research by the team.

The Community Connector (CC) project was awarded at the end of 2011. Given N/CRSP-Africa comprehensive research agenda, and because the actual group of interventions the CC will implement will *vary by district*, we focused on developing and distributing assessment tools, and developing the required logistical systems to comprehensively assess agricultural, nutritional, and health parameters. Uganda is complex in that most districts have independent nutrition, agriculture, and health programs in place. The effects of the Community Connector could be obscured by these other programs, many of which are funded by non-governmental bodies. Thus, the mapping exercise funded in FY 2012 will help inform us as to the breadth, scope, and types of these influences.

The UCC is being implemented in a rolling fashion in six districts (Kamwenge, Kole, Lira, Dokolo, Kisoro, Agago) in Uganda in Phase I and will then be implemented in additional districts in Phase II. The UCC is implementing interventions in a tailored fashion in each district, and is operating most intensively in two sub counties in each district. Thus, there are sub-counties within districts receiving intensive interventions and sub-counties in districts receiving district-level interventions and which may take up specific interventions by diffusion.

In order to assess the *outcomes* and *processes* of the UCC, two overlapping, complementary approaches are being used. These approaches were discussed at the June 2012 meeting held by the N/CRSP-Africa and N/CRSP-Asia in London and externally reviewed at that time for rigor and power. Two interwoven studies that examine the overarching research themes of the N/CRSPs through two different lenses, will allow us to examine our research questions at both the population and individual levels.

The studies are designed to enable N/CRSP-Africa to study changes over time, which may be attributable to the UCC, without confusion regarding secular trends. The first approach is to

periodically sample areas with and without UCC implementation. The second is to longitudinally follow pregnant women and their offspring in a birth cohort, again with enrollees in locations with and without UCC implementation. In order to make these studies more feasible, the process of study development and IRB approval was sequenced, so that the initial focus has been on the periodic panel surveys with the subsequent focus on the prospective birth cohorts. The intent is to have the data from the period panel surveys inform the prospective birth cohort study design and implementation.

- **Periodic Panel Survey Data** to be obtained from parishes in sub-counties *with* UCC implementation within the studied parish; parishes *without* specific intervention which yet lie within a district targeted by the UCC; and parishes from districts *without* any current UCC intervention. N/CRSP-Africa is collecting extensive information relating to nutrition, agriculture, and health at the household level including testing for malaria and anemia in index women of childbearing age and their children. This information provides aggregate data on household structures and dynamics, agricultural practices and gender roles, population health, and nutritional information. Of note, districts designated for UCC implementation in Phase II will be surveyed before implementation and then (in the future) after implementation, allowing for a classic before-after assessment. Other districts in Phase I of implementation will be assessed for changes over time (initial period versus after implementation), and contrasted with the Phase II group. IRB approval for the panel surveys was obtained in Y2.
- **Prospective Birth Cohorts** will begin in similar and overlapping sets of locations (parishes with specific UCC interventions as well as parishes without specific UCC interventions, both in districts targeted by the UCC; and parishes in districts without any UCC interventions). This set of studies will be able to link individual women and young children, who are the most sensitive indicator group for UCC interventions, to the benefits (or lack thereof) of UCC interventions. Birth cohorts were chosen because women and infants are key target populations who “should” benefit from UCC interventions if anyone does; and because of the scientific power they provide (in comparison to other study designs) for ascribing benefits or changes to specific interventions experienced by the mother and child.

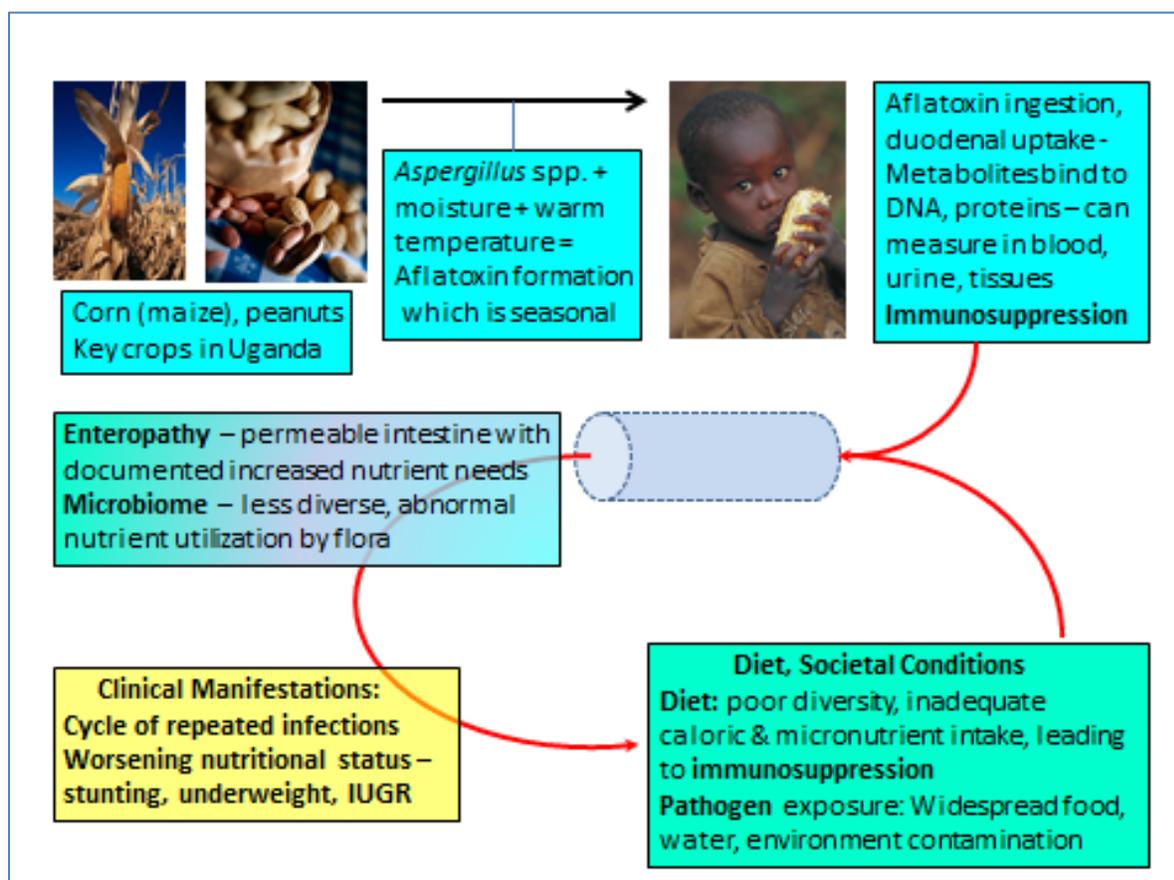
As in the N/CRSP-Asia research plan, the overall intent of N/CRSP-Africa research remains the same: to conduct periodic surveys at household level; and to collect individual level information in study sites, represented by the birth cohort study. N/CRSP-Africa will complement these with surveys/focus groups/or expert opinion interviews in the same sites but with service providers and policy makers/implementers as the unit of study, in harmony with the approach used by the N/CRSP-Asia in Nepal. This was not a FY 2012 N/CRSP-Africa activity, but is planned for the coming year. Please find more details in the sections below.

**Timing of Data Gathering:** Implementation of the panel surveys began at the end of FY 2012 (Y2 of N/CRSP-Africa). The complete list of sites for UCC implementation was not known until September 14, 2012. Implementation of the prospective birth cohorts will begin in Y3, informed by the panel survey results. These delays were outside of the control of N/CRSP-Africa and have shifted the timing of the data collection somewhat. Details are discussed under specific activity points.

**Improvements in Rigor and Power:** Two events in FY 2012 enhanced N/CRSP-Africa research. During Y2, N/CRSP-Africa requested additional funding for biochemical testing of study participants. One of the major rationales for this is that nutritional and health outcomes may be detectable via biochemical measurement before they are detectable via anthropometric measurement. Thus, for example, vitamin A or hemoglobin levels may significantly improve in a population before a statistically-significant change in stunting or underweight is noted. N/CRSP-Africa has been informed of the award of an additional \$300,000 in funding for Y3. The addition of this biochemical testing will greatly improve the rigor and power of the research. The N/CRSP-Africa is very grateful to USAID for these resources.

In addition, the design of the panel survey studies was altered to include counterfactual districts without UCC interventions after the internal and external reviews we conducted in London in June 2012. This alteration to the study design will improve our study by providing areas for comparison with the areas where UCC implementation will occur.

**Collaboration with other USAID BFS CRSP Projects: Building synergy around mycotoxin exposures and food safety**



**Figure 1: Putative relationship between mycotoxin exposures and environmental enteropathy**

In July 2011, Drs. Griffiths and Webb attended the CRSP Council meeting in Uganda. Interactions with the other BFS CRSP projects have subsequently organically arisen, with an initial focus on

mycotoxins, including aflatoxins, as a target for integrated agriculture and nutrition programming. Good drying and storage practices for staple foods in Uganda (and in Nepal) should minimize mycotoxin exposures. It is possible that an agriculture/ nutrition/health implementation package, which includes best storage practices, improving nutritional intakes, and water and sanitation will significantly improve N/CRSP-Africa target population health and nutrition outcomes. Current cutting-edge thinking is that environmental insults such as aflatoxin exposures, reducing poor health relating to infections (water and sanitation, HIV), and nutritional gaps must all be addressed to eliminate malnutrition.

N/CRSP-Africa has discussed assessing aflatoxin exposure in the birth cohort study it will conduct in Uganda (see prior pages) with the Peanut CRSP; Ugandan aflatoxin researchers; and USAID staff in East Africa and in Washington, DC. This collaboration speaks directly to the issues of food safety, leveraging the outputs of several of the BFS-supported CRSPs, and collaborations with other major international actors. With the assistance of USAID, for example, N/CRSP-Africa has also discussed with IFPRI about the studies to be conducted in Kenya to assess both the relationship between aflatoxins and stunting, and the value of a replacement program for contaminated foodstuffs (Laurian Unnevehr, Jef Leroy, IFPRI).

The Uganda birth cohort studies provide a superb opportunity to prospectively study aflatoxin exposure in pregnant women and in their children. The aflatoxin literature is controversial as it suggests, mostly through associative studies, that more than 40% of stunting may be related to mycotoxins. The staple crops in Uganda vary in the level of contamination by agro-ecological zone and by drying and storage practices. Furthermore, because there is substantial variability in crop consumption at the subsistence farmer and cash-crop farmer levels, we will likely identify a wide spectrum of exposure (from low to high). Mycotoxins may lead to environmental enteropathy and a ‘leaky’ or permeable intestinal tract. The strongest biological predictor of stunting in children is intestinal permeability (see diagram above). Thus, the N/CRSP-Africa is eager to utilize its research platform relating to the UCC to assess the effects of integrated agriculture/nutrition programming as it relates to aflatoxin exposure, and to the nutritional/health outcomes in women and infants.

## **Y2 Outputs – Uganda-Based Research**

### **3.1 Research workshop for core partners held – Achieved.**

Two relevant workshops were held relating to this Y2 output. A research-methods workshop was held in Jinja, Uganda in March 2012. The N/CRSP-Africa team was joined there by representatives of the core RFA team partners and IPA researchers, along with a wider group of Ugandan stakeholders, the UCC, and the USAID/Uganda Mission. This workshop both served to educate a wider audience regarding integrated agriculture, nutrition and health programming, and acted as a forum for partner discussions around our research. At a second workshop at Johns Hopkins University in December 2011, methodological and technical details of N/CRSP research both in Asia and Africa were discussed in depth with our core partners and considerable progress was made on approaches, design, sampling frames, and instruments. Lastly, the activities held in June 2012 in London—the “pre-*Lancet*” meeting of the BoD/TAC and, in particular, the external review of the

research programs in Nepal and Uganda—further cemented the core partner involvement and input into the research agenda.

N/CRSP-Africa anticipated development of its research agenda with input not only from the UCC, but also the IPA group conducting a randomized, controlled trial of gender-related interventions in FTF districts in Uganda. However, IPA has withdrawn from this interaction.

### **3.2 Development of research protocol (presented in Uganda, the US, and the UK) and baseline characterization – Achieved.**

After the award of the UCC in late December 2011, it became possible to begin the N/CRSP research design process for assessment of the UCC. The panel survey element of the research was initially addressed, noting that the birth cohort (Output 3.3) would be informed by the results of the initial data collection. The period January through August was devoted to the design of study instruments and logistics, and from August forward to field implementation. The district sites for the UCC interventions in Phases I and II were not identified until the end of FY 2011. IRB approval was obtained in Uganda (Output 3.4) for the baseline characterization during the summer of 2012.

Representative baseline characterization of the districts where the UCC operates is ongoing.

### **3.3 Birth Cohort set up – Partly Achieved**

The design of the birth cohort and its set up were discussed by the N/CRSP-Africa at the Johns Hopkins University meeting in December 2011; by the RFA team in design meetings in Uganda from January throughout the fiscal year; with stakeholders at the Jinja workshop in March, 2012; and with the BoD/TAC and external reviewers in June 2012 in London. The detailed design for the birth cohort has begun. While the baseline characterization research has moved into the collection phase, members of the RFA team have focused on birth cohort parameters such as: the birth cohort sample size; locations; participant retention; instrument design; biochemical characterization of the mothers and infants; potential for mycotoxin exposure assessment; budget design; IRB evaluation; data collection and management; and staffing. We note with appreciation the additional funding we have received for biochemical markers.

Realistically, the birth cohort study could not be set up and initiated until the initial data collection was completed and the district sites were identified.

### **3.4 Institutional Review Board (IRB) Review for Panel Surveys – Achieved.**

IRB approval by the Ugandan authorities was obtained in the summer of 2012 for the baseline characterization. This has allowed the study to move forward. IRB approval in the US with the final instruments will be obtained in November 2012 so that the Tufts and Harvard University team members may participate in examining the collected data. Current IRB approval allows data collection to proceed in Uganda.

IRB approval for the next operational step, the birth cohort study, will be obtained in FY 2013 after the design elements are finalized using data from the baseline characterization. IRB approval for

the birth cohort study cannot be initiated until the design elements are finalized with the baseline information.

### **3.5 Stocktaking reviews (2) and discrete studies (2) defined and Initiated – Achieved x 3; Partially Achieved x 1**

**3.5.1. Stocktaking of curricula related to nutrition.** This activity has been ‘defined and initiated’ at the Makerere School of Public Health. This activity will result in, as a functional work product, a course developed for capacity building and outreach. In FY 2012, the National Planning Authority’s working group on nutrition recommended that the N/CRSP stocktaking exercise be focused on the needs at the higher education level. This group was headed by Dr. Robert Mwadime, who is leading the UCC implementation, and Dr. Joyce Kikafunda of the N/CRSP team. Formal nutrition education programs only exist at a few universities, such as Makerere and Kyambogo Universities. There is a substantial gap in the educational sector with many professionals having little exposure to important nutrition concepts or specific interventions. Based upon input from the academic sector and implementing agencies, the entire course will likely include the following modular short course elements:

<b>3.5.1. Course Developed at Makerere University School of Public Health to Address Curricular Needs in Uganda. Work-product of stock-taking exercise. Intended audience: higher education</b>
<p><b>Introducing Public Health Nutrition: Concepts and Definitions</b></p> <ul style="list-style-type: none"> <li>· Definitions of malnutrition and the conceptual framework of the causes of malnutrition</li> <li>· Nutrition epidemiology (magnitude and distribution of malnutrition in Uganda and Sub-Saharan Africa)</li> <li>· Positioning nutrition - relationship with other sectors</li> <li>· Food security</li> </ul>
<p><b>Nutrition Assessment at the Community Level; Nutrition Security</b></p> <ul style="list-style-type: none"> <li>· Classifying malnutrition</li> <li>· Common micronutrient problems in Africa</li> <li>· Conducting malnutrition screening at community level – method and tools</li> <li>· Conducting a population-based nutrition and food security survey – methods and tools</li> <li>· Practical sessions</li> </ul>
<p><b>Nutrition family care practices, interventions and counseling</b></p> <ul style="list-style-type: none"> <li>· Breastfeeding and lactation management</li> <li>· Complementary feeding and practical sessions on family level practices to improve quality of complementary foods</li> <li>· Anemia and vitamin A</li> <li>· Maternal essential nutrition actions</li> <li>· Basics of nutrition counseling at the individual and group levels</li> </ul>
<p><b>Monitoring and Surveillance</b></p> <ul style="list-style-type: none"> <li>· Introduction to basics of Monitoring &amp; Evaluation</li> <li>· Routine – HMIS (Health Management Information Systems)</li> <li>· Sentinel site surveillance</li> <li>· Surveys as a surveillance tool</li> </ul>
<p><b>Public Health Nutrition Planning and Programming</b></p> <ul style="list-style-type: none"> <li>• Mobilization and advocacy</li> <li>• Nutrition Work Plan generation</li> </ul>

N/CRSP-Africa is excited to note (see 4. Uganda-Based Capacity Building) that a Tufts-developed, open-source, electronic platform for education and knowledge management has, through independent USAID and NIH funding, been made functional at Makerere University. This system (the Tufts University Science Knowledgebase, or TUSK; rebranded as MUSK for Makerere University's use) is already being used to deliver nutrition-related public health content to more than 150 distance education MPH students in Uganda. Thus this N/CRSP-Africa exercise—and its functional work product, a course—can be used to reach a wide audience in Uganda. TUSK is now operational in Kenya, Uganda, Tanzania, the Democratic Republic of Congo, India, and will shortly be operational in Ethiopia, Ghana, and Rwanda with other USAID funding. This provides the opportunity to expand the benefits of this activity to reach a much larger audience.

**3.5.2. Stocktaking review of interventions in Uganda.** The purpose of this exercise has been to delineate interventions occurring at the district level, which might also influence the processes and outcomes studied by the N/CRSP-Africa. These activities, conducted outside the purview of the UCC, could lead to incorrect conclusions relating to the process and conduct of the UCC, and its associated outcomes. This review was defined, initiated, and completed by Edgar Agaba. The report is provided in Appendix 5.

**3.5.3. Discrete Study #1 – Framing of N/CRSP-related questions and delineation of secondary data sets for analysis.** This study has been framed and initiated as per the 2011 Work Plan. Dr. Nassul Kabunga, a postdoctoral fellow at IFPRI and half-time N/CRSP-Africa funded, has worked closely with the RFA Team to identify secondary data sets for analyses and design data collection instruments for the baseline surveys. In addition, he has interacted with Dr. Gerald Shively at Purdue University, an N/CRSP core partner, around the use of the secondary data sets. In the FY 2011 plan N/CRSP-Africa has discussed collaboration with the Uganda Bureau of Standards (UBOS) regarding analysis; however, the UBOS has been focused on a new Ugandan census. N/CRSP-Africa anticipates using the secondary data sets for analyses in FY 2013.

**3.5.4. Discrete Study of the management of integrated activities at the district level.** This activity has been designed, however its implementation has been delayed due to the delay in identification of UCC study districts in Uganda. This study will be pursued in Y3.

**Note relating to activities of Heifer International – FY 2012 (Y2) discussions.**

N/CRSP-Africa has discussed an evaluation of Heifer International's activities (and their effects on nutrition, income, agriculture, and health in households) with Dr. Laurie Miller in Uganda. Heifer International Uganda has approved this activity, and after signing a Memorandum of Understanding, N/CRSP-Africa will support data collection in Uganda. The N/CRSP-Asia annual report describes collaboration with Heifer International in Nepal (in Nawalparasi district which is one of N/CRSP-Asia's 21 survey sites). Again, this provides additional evidence of synergies between the N/CRSPs.

**3.6 Desk reviews leading to at least four working papers/briefs drafted – Partially Achieved**

We planned to undertake four or more studies focused on the substantive issues that frame N/CRSP research, namely: a) metrics used to assess transmission mechanisms for agriculture-to-

nutrition impacts (program theories); b) research methods applied to integrated multi-sector programming; c) an updated review of evidence of impact of food-based programming; and d) a review of constraints to young child feeding in Africa, focused on complementary foods. Some of these drafts are the product of the N/CRSP (Africa and Asia), and others are the specific product of the N/CRSP-Africa. Two Uganda-specific papers include: e) an analysis of the GINA II study; and f) an initial analysis of the baseline data compared with data from prior datasets.

The first three desk reviews have been completed and posted. The fourth desk review on complementary feeding practices is not yet complete. The analysis of the GINA II study has been delayed as the GINA II PI, Dr. Joyce Kikafunda, was nominated to become the High Commissioner to the UK. The analysis of baseline data and comparison to prior datasets has been delayed by the timing of the baseline data collection (see Section 3 Introduction, and Section 3.2).

**3.7 At least three presentations made on N/CRSP-Africa work at scientific meetings – Achieved Two publications submitted or published – reanalysis of GINA II and initial characterization of the baseline data – Postponed to FY 2013.**

1. The Program Director (Jeffrey Griffiths) spoke about N/CRSP-Africa (and N/CRSP-Asia) at the Third International Food and Nutrition conference at Tuskegee University on October 9-11, 2011.
2. Dr. Griffiths also discussed N/CRSP-Africa's focus on maternal and childhood nutrition insults, which could lead to long-term adverse cognitive and brain disorders, at the first Ugandan Meeting on Brain Disorders (February 1-3, 2012; see [www.braindementia.net](http://www.braindementia.net)). Dr. Griffiths helped organize this meeting and Dr. Joyce Kikafunda was a presenter.
3. The Associate Program Director (Shibani Ghosh) presented concepts of longitudinal studies and the development of birth cohort studies at the research methods workshop in Jinja, Uganda in March 2012.
4. Dr. Griffiths presented information at the Wilton Park Conference on Improving Diet and Nutrition: Challenges for Global Food, Agricultural, and Land Use Policies (April 23-25, 2012) in the UK.
5. Drs. Ghosh and Griffiths presented the research activities of the N/CRSP-Africa work at the London School of Hygiene and Tropical Medicine meeting in June 2012.
6. Edgar Agaba, in-country representative and coordinator in Uganda, made a presentation on the N/CRSP-Africa at a scientific meeting of all the CRSPs operating in Uganda on April 25, 2012. This meeting was organized by Simon Byabagambi of USAID/Uganda. It was highly successful and has led to calls within Uganda for more collaboration among the CRSPs, N/CRSP-Africa has offered to co-host another meeting in FY 2013.

In addition to these presentations, Dr. Patrick Webb (the N/CRSP-Asia Director) discussed the N/CRSP-Africa at a seminar for USAID staff in Washington, DC, on May 3, 2012, and also during opening remarks for the 2<sup>nd</sup> annual joint American Agricultural Economics Association (AAEA) and the European Association of Agricultural Economics (EAAE) symposium on Food Environments in Boston on May 30-31, 2012. In addition, Dr. Eileen Kennedy, Co-Program Director, has made presentations to raise awareness of the N/CRSP-Africa research agenda at several Scaling Up

Nutrition (SUN) meetings (including at the UN General Assembly meeting in New York City in September 2012).

#### **4. Uganda-Based Capacity Building**

Achievements in capacity building in Uganda in Y2 are presented in the box below. In general, the N/CRSP-Africa has made excellent progress on the first group of activities, and experienced delays with the implementation of two of the three workshops we had originally planned.

The TUSK electronic platform (supported by other USAID funding) proposed for dissemination of agriculture/nutrition/health information is already being used for distance education in the Makerere University, School of Public Health MPH program, where skills and knowledge relevant to the N/CRSP-Africa are taught. An initial estimate is that more than 150 distance education students are using the system, as well as the cohort who are physically attending class at the University. This is an excellent example of synergy between USAID supported programs. TUSK has now been installed in Uganda, Tanzania, Kenya, the Democratic Republic of Congo, and Ghana, and will be installed at universities in Ethiopia and Rwanda in the coming fiscal year. Thus, it provides a platform for N/CRSP research dissemination and the development of a community of discourse around agriculture, nutrition, and health in each of these countries.

##### Summary of Y2 Outputs – Capacity Building

- 4.1 Recommendations on nutrition-relevant curriculum enhancements in Uganda – Achieved
- 4.2 Eight students (from Y1) complete MS fellowships/MPH, 2 Y2 initiate fellowships – Achieved (2 Y2 MS fellowships replaced by support for 1 PhD fellowship for Gulu University faculty).
- 4.3 Four Ugandans identified for BBNC training in India (January 2013) – In Progress
- 4.4. Short courses developed and offered online via TUSK – Partially Achieved (See 3.5.1)
- 4.5 Ugandan student visits – MS student visits devolved to Core Partners and planning for PhD student – Partially Achieved
- 4.6 Twelve government officials attended the research methods workshop – Achieved  
Thirty government officials to attend a workshop on Evidence-Based Policymaking for Nutrition in Uganda – Postponed to Y3 with participation of Office of the President
- 4.7 Forty-four professionals attend training on issues in public health nutrition – Achieved.
- 4.8 Forty researchers/professionals attend training on grant writing and research proposal development for future RFAs – Deleted

#### **4.1 Recommendations on nutrition-relevant curriculum enhancements in Uganda – Achieved**

This activity has been described in part in Section 3.5.1 and is based partly on that stock-taking exercise. Key recommendations from the National Planning Authority's nutrition working group were that curriculum enhancements at the higher education level are most appropriate for the N/CRSP and that a vehicle for dissemination of curricular materials be identified which can reach a national audience, not simply one at a given university. Another key finding is that persons trained in agriculture, nutrition or health rarely have substantial knowledge of the other disciplines. This activity is being pursued by the Makerere School of Public Health in the design of a nutrition curriculum for a national audience, available on-line via the TUSK/MUSK system described in

Section 4.4. Explicit support for nutrition training programs will continue through the support of student research, short courses, and support for new training programs. N/CRSP-Africa has identified Gulu University as a potential site for the development of a nutrition program aligned with their public health program.

#### **4.2 Eight students complete MSc fellowships/MPH – Achieved (in addition to 1 PhD fellowship for Gulu University faculty)**

**Eight MSc/MPH students supported.** Funds for the support of eight MSc or MPH student research projects in Uganda were allocated in Y1. In order to achieve ‘quick wins’ we asked our faculty colleagues at Makerere University in Uganda to identify students who had completed their classroom studies but did not have funds for their research projects. This funding would allow seven students to complete their degree requirements and, after graduation, enter the workforce. Otherwise, the time and resources invested in their classroom work would have been wasted in terms of completing their degrees. In addition, N/CRSP-Africa has supported the MPH education of an eighth student at Mukono University who has a strong background in nutrition field research and was a supervisor in the GINA II project which examined integrated packages for pregnant women and children. The students have either completed their field research in Y2 or are in the process of completing their studies now.

**Support for Ugandan PhD student in Uganda.** In FY 2012 N/CRSP-Africa identified Dr. Barnabas Natamba, a faculty member at Gulu University, who is obtaining his PhD from Cornell University while remaining on the faculty at Gulu. He required funding for his field work on food security, nutrition, and HIV. N/CRSP-Africa is supporting his field research in Uganda with assurances from both Gulu University and Mr. Natamba that he intends not only to remain in Uganda, but also to build a nutrition and public health training and research program at Gulu University.

#### **4.3 Four Ugandans Identified for BBNC training in India (January 2013) – In Progress**

Applications for BBNC training have been solicited and final decisions will be made in November 2012 by the BBNC selection committee. Although not a named objective for Y2, we supported a Ugandan trainee (Dr. Nassul Kabunga) at the BBNC in January 2012.

#### **4.4. Short courses developed and offered online via TUSK – Partially Achieved**

This objective has narrowly been partially achieved—and over-achieved in another sense. In Section 3.5.1., the results of an inquiry into nutrition curricula in Uganda, and the development of a course (composed of modular short courses) to be put on-line are described. TUSK refers to the Tufts University Science Knowledgebase management software, rebranded at Makerere as MUSK. N/CRSP-Africa had anticipated a series of small short courses designed for various audiences, however the National Planning Authority and its working group on nutrition recommended a modular course for a higher-education audience. The faculty member at the Makerere University School of Public Health responsible for the courses had to take a leave of absence for health reasons and, thus, the development of the courses was picked up by Drs. Henry Wamani and Justine Bukonya. Activities around this are currently ongoing. In this regard, the objective has been partially achieved.

In a proof of concept for this approach, more than 150 distance education students at the Makerere School of Public Health are receiving course materials in public health nutrition and other courses, such as epidemiology and biostatistics, via MUSK across Uganda. Thus, the number of students *already* being reached by this approach is significant. This is an important step since it provides a roadmap for mounting the courses onto a nationally-accessible platform.

#### **4.5 Ugandan student visits – MS student visits devolved to Core Partners and planning for PhD student – Partially Achieved**

In this objective, N/CRSP-Africa in its annual plan stated that it was involved in discussions with partners around visits by students to “learn about-large scale programming around maternal and child health and nutrition.” No specific target was identified. During FY 2012, it was realized that short-term visits by students are difficult because of academic calendar issues, and that some of the N/CRSP-Africa Core Partners (Harvard, Johns Hopkins, Tuskegee, Purdue) are better equipped for such visits. Students who take time away from their studies in Uganda are at risk of graduating a year behind their anticipated date because they have vacation interspersed throughout the academic year without the equivalent of a summer break as in the US. Thus the ME devolved short visits in FY 2011 to N/CRSP-Africa partners and instead has planned for the admission and support of a Ugandan PhD student at Tufts. One candidate has been identified and will be applying for admission in FY 2013, and another excellent candidate has approached the N/CRSP-Africa.

#### **4.6 Twelve government officials attended the research methods workshop – Achieved Thirty government officials to attend a workshop on Evidence-Based Policymaking for Nutrition in Uganda – Postponed to allow participation of the Office of the President**

Twelve representatives from Government of Uganda Ministries (Health, Agriculture, and Gender, Labour and Social Development) and target districts (Kiruhura, Agogo, Pader, Dokolo, Kanungu) attended the Jinja workshop in March of 2012.

The evidence-based workshop was intended for early in FY 2012 and was then re-scheduled for later in FY 2012 after passage of the Uganda National Action Plan (UNAP) bill by Parliament. The UNAP bill transferred the coordination role for Nutrition to the Office of the President. The Ebola outbreak in Uganda, however, prevented travel by N/CRSP-Africa personnel in preparation for the meeting and uncertainties as to the duration of the outbreak led to its postponement until FY 2013. It is anticipated that Dr. Eileen Kennedy will also participate in this workshop early in FY 2013 along with representation of the Office of the President of Uganda.

#### **4.7 Forty-four professionals attend training on issues in public health nutrition – Achieved**

Forty-four individuals attended the research methodology workshop in Jinja, Uganda in March 2012.

#### **4.8 Forty researchers/professionals attend training on grant writing and research proposal development for future RFAs – Deleted**

The primary intent of this workshop was, as stated in the FY 2012 plan, to educate a cadre of Ugandan professionals how to be more successful in responding to RFAs. A secondary intent was to

generally improve the skill sets of Ugandan professionals in grant writing and proposal development. In FY 2012, it became clear that: a) no new FY 2012 or FY 2013 RFA would be issued by the N/CRSP-Africa; and b) many of our Ugandan partners already provide training of this type. The objective was deleted as resources allocated for this objective would not substantially contribute to the capacity-building mission of the N/CRSP in FY 2012. The decision on this workshop is likely to be revisited with a more nuanced approach to the proposal writing needs of the professional agriculture, health, and nutrition communities. Funds budgeted for this training were instead used to support other capacity building in Uganda (e.g., partial funding for the PhD student at Gulu University).

## 5. Additional Activities

During Y2, N/CRSP-Africa has engaged with a number of Ugandan and international collaborators. In addition, a USAID/Malawi buy-in into the N/CRSP Leader Award has allowed for assistance in capacity building at Bunda Agricultural College in Malawi. Specific examples of additional activities include:

- **Uganda – Gulu University.** In FY 2012, support provided for the field work of a promising Gulu University faculty member, Mr. Barnabas Natamba. Mr. Natamba and Gulu University have proposed to establish a public health nutrition training and research unit. Currently, there are few such training sites in Uganda. The N/CRSP-Africa has actively negotiated with Mr. Natamba and Gulu University to establish a common understanding of the required steps.
- **Uganda – UNICEF.** UNICEF is interested in collaborating with N/CRSP-Africa on their research capacity and agenda. Discussions have been initiated.
- **Uganda – FANTA III.** FANTA III has proposed that N/CRSP-Africa partner with them on a fellowship program entitled ‘Uganda National Leadership Training Program (UNLP).’ This possibility is being explored. Since 2010, eight FANTA fellows have been attached to the Ministries of Health and Agriculture, the National Planning Authority, and the Uganda Action for Nutrition and Uganda Dietetics Association professional bodies. Based on program feedback, the UNLP will be altered to include leadership training. Fifteen fellows will be enrolled in government and private sector positions. The intent is to strengthen nutrition leadership skills, establish a platform for mentorship and networking among University nutrition graduates, create employment opportunities, and bridge gaps between University training and employers. Discussions have been initiated with FANTA III.
- **Uganda – CRSPs.** As noted above, N/CRSP-Africa is one of many CRSPs operating in Uganda. Because the N/CRSP-Africa offers a platform for integrating the findings/work products of the other CRSPs, there are opportunities for synergistic capacity-building collaborations. One prominent example is the potential activities around the measurement of aflatoxins that has been discussed with the Peanut CRSP.
- **Uganda-USGS-N/CRSP.** The N/CRSP-Africa research agenda could be enhanced by remote sensing data indicating crop conditions, vegetation, soil characteristics, rainfall, and other environmental and climate-related information. N/CRSP-Africa has met with parties from the USGS around the issue of obtaining such information. To this end, capacity building in GIS and the use of remote sensing may be an output that may be identified in the future.

- **Malawi** – The following activities are underway: curriculum review of nutrition in higher education; assisting with the establishment of a dietetics training program; faculty development; and the construction of new, Malawi-specific food composition tables. While these activities are Malawi-specific, they complement the curricular reviews, program development, and capacity building in Uganda, and may provide opportunities for regional synergies in capacity building.

## 6. Financial and Administrative Issues

In FY 2012, N/CRSP-Africa deepened its administrative expertise and additional confidence was built within the University around the relationship with USAID and its partners. An excellent example of this was the set of constructive and relationship-building actions around the USAID/Malawi buy-in to the N/CRSP leader with an Associate Award. In addition, both N/CRSP Africa and Asia underwent a random audit by Tufts University which was successful. The N/CRSP-Africa ME continues to function with a lean management structure that enjoys numerous synergies between N/CRSP-Africa and N/CRSP-Asia. N/CRSP-Africa received an Associate Award from USAID/Mali in Y1, a buy-in from USAID/Malawi in Y2 and is aware of interest from several other Missions.

N/CRSP-Africa remains tightly aligned with the USAID/Uganda Mission on its agenda for integrated agriculture, nutrition, and health programming, as well as FfF objectives.

**Core Partner Funding.** The ME has worked closely with its core partners to establish subcontracts and scopes of work for Y2, allowing for disbursement of funds to enable their activities to begin. In Y2, the budgets for N/CRSP-Africa partners were adjusted from the Y1 levels to reflect their progress to date, potential contributions, and degree of participation in Uganda. Among core partners, Harvard University (through its partnership on the field research team), Purdue University, and Tuskegee University have been most prominently active in Uganda, and were funded for research and capacity-building activities.

**In-Country (Uganda) Funding.** The RFA Team in Uganda has, despite its leadership changes, continued to function smoothly. Subcontracts with Makerere University, IFPRI, and Gulu University have been active and function smoothly. The transition in RFA Team leadership occurred without causing any delays internally. The N/CRSP-Africa in-country representative, Mr. Edgar Agaba, has represented the N/CRSP at meetings with FHI360, UCC, USAID/Uganda, UNICEF, and other CRSPs, among others. In addition, he has been highly effective as a liaison with ministries and the Office of the President.

**USAID/Malawi buy-in to the N/CRSP-Africa Leader with Associate Award.** Although activities relating to Malawi were initiated by the ME early in 2012, for technical reasons, funding for these activities was delayed. Both USAID and Tufts cooperated to ensure that N/CRSP-Africa activities in Malawi continued.

Dr. Paul Giguere, Associate Director for Communications, left Tufts in August 2012. He was not replaced in the N/CRSP ME through the end of Y2. An assessment will be made of how to share his role among other members of the team for Y3.

## **7. Overall Progress toward FtF Indicators (See Appendix 5, tabular format)**

During FY 2012, major progress was made in clarifying, within Uganda, that N/CRSP-Africa is pursuing a research agenda with custom indicators. In addition, N/CRSP-Africa has offered to collect information, when possible within its research agenda that can inform USAID and the UCC program on their goals and outcomes using standard FfF indicators.

N/CRSP-Africa had a goal of enhancing research capacity in seven US and host country institutions. A total of 29 institutions participated in research methodology workshops or other activities in Uganda and Malawi. If the Ugandan ministries and district governments are consolidated to central and district governments, the totals are 23 institutions in Uganda and one in Malawi. These include:

- US Universities (5): Tufts, Harvard, Purdue, Johns Hopkins and Tuskegee Universities
- Ugandan Universities (4): Makerere, Kyambogo, Mukono, Gulu Universities
- Ugandan Ministries (3): Ministry of Health, Ministry of Agriculture, Ministry of Gender, Labor, and Social Development
- Ugandan Districts (5): Dokolo, Kisoro, Kamwenge, Kole, Lira and Agago
- Other Ugandan governmental institutions (2): Regional Centre for Quality Health Care and FANTA II
- Nonprofits and others (10): IFPRI, IHSU, MIRS, VEDCO, PDLG, IPA, BRAC, FHI360, MAIIF and Grameen Foundation
- Malawi: Bunda College of Agriculture (soon to be University)

In terms of food consumption and nutrition surveys, the goal was four surveys, and 11 surveys were undertaken, or reported on and disseminated. These include:

- The DAI value chain analysis undertaken in FY 2010 and 2011. DAI has prepared a draft analysis which has been circulated to Ugandan colleagues. A report is attached as part of the research briefings.
- Purdue University completed a Uganda landscape nutrition survey review. A working paper is attached.
- Purdue University conducted a prospective agricultural survey relating to aflatoxins. A research briefing is attached
- Seven Ugandan students have undertaken Master's research projects relating to: aflatoxin ingestion; vitamin A intake; agricultural and nutritional determinants of stunting; estimates of meat demand in Uganda; factors which influence complementary feeding practices in children aged 6-23 months in Pader District; estimation of undernutrition in women aged 15-45 in Agogo District; and the role Kanungu District male heads of household's

knowledge, attitudes, practices and participation plays in the nutritional status of children aged 6-59.

- The N/CRSP-Africa main baseline data collection in six districts was undertaken at the end of FY 2012 (Y2).

The N/CRSP-Africa output indicator for “the number of US or Ugandan institutions or individuals having undertaken a nutrition assessment, survey or gap analysis” was also met. The Y2 goal was nine, while a total of 12 assessments/surveys/gap analyses were undertaken. These include:

- Purdue University – landscape analysis;
- Tuskegee University – gap analysis relating to food safety and regulation;
- Makerere School of Public Health – curriculum gaps and opportunities;
- RFA Team – main study survey baseline assessment;
- Tufts University – assessment of nutrition interventions in target UCC districts; and
- Supported seven students to conduct gap analyses for their projects *before* conducting assessments or surveys.

The N/CRSP-Africa anticipates that a majority of these will lead to publications or reports. N/CRSP-Africa intends to assist students to publish their results. Due to delays in implementation of N/CRSP-Africa field research, the ability to submit formal papers to peer-reviewed journals (N/CRSP Output Indicator 8) was severely constrained. That said, draft papers have been developed in the form of working papers and research briefings. (Drafts are appended to this report and a list of titles is provided in Appendix 7). Many of these will be further elaborated into formal papers for publication in Y3.

Other N/CRSP-Africa output indicators relate to briefs, presentations, and publications co-authored with host country institutions. The RFA Team made approximately 12 presentations at the Jinja workshop and, during FY 2012, three presentations to USAID/Uganda. The results of the initial baseline data collection were anticipated to be the main driver of joint presentations and publications, however, data collection was delayed. The DAI investigation of complementary food value chains will involve Ugandan colleagues.

N/CRSP-Africa had a goal of supporting two persons in long-term training programs. N/CRSP-Africa actually supported eight MSc students and one PhD student at Tufts.

In terms of short-term training, the goal was 100 persons. N/CRSP-Africa actually supported the training of 108 field workers, 44 attendees at the Jinja workshop, and one BBNC course attendee. Our core partners also provided short-term training as discussed in their reports.

## 28. Y2 Project Performance Narrative – Summary

**Name of Program:** Nutrition Collaborative Research Support Program – Africa (N/CRSP-Africa)

**Primary Grantee:** Tufts University

**Program Objective:** The mission of N/CRSP-Africa is to discover how policy and program interventions can most effectively achieve large-scale improvements in maternal and child nutrition, particularly when leveraging agriculture. The program emphasizes: a) operationally relevant research that can support national governments across Africa in their attempts to improve nutrition, health, and agricultural productivity; and b) human and institutional capacity building in the domain of food and nutrition policy analysis.

**Primary Accomplishments/Outcomes in FY 2012:** N/CRSP-Africa successfully competed an RFA for a Uganda team to conduct research on the USAID Uganda Community Connector (UCC) Project. It built an infrastructure to conduct CRSP panel surveys and birth cohort studies. We worked collaboratively with USAID/Uganda, the UCC, and other partners in developing specific data tools and approaches. These include an electronic data collection system that was developed to improve data quality and fidelity. During FY 2012, the research team's strength was proven by its seamless continuation during leadership changes. Tufts and its core partners, working in parallel to the RFA team, assessed: the overall nutrition landscape in Uganda; the likely importance of environmental factors such as mycotoxins; the adverse health impacts of smoke-producing agricultural biofuels; and potential confounding interventions in implementation districts. Core partners also participated in Ugandan food safety and technology activities, curricular reviews, and student support. A nutrition curriculum, suitable for higher education audiences, is under development for delivery via an online platform (TUSK) supported by both N/CRSP-Africa and other USAID programs. A cluster of research projects conducted in Uganda by Ugandan MSc, MPH, and PhD students rounds out this list of accomplishments. In Malawi, we provided capacity-building support to Bunda Agricultural College and the Ministry of Health, supported faculty development and student education, and provided a roadmap for developing a Malawian food table.

**Implementation Issues:** The main FY 2012 challenges for N/CRSP-Africa were: a) temporal delays in the USAID/Uganda UCC Project Award; and b) identification of the districts where the UCC will be operating. This led to delays in finalizing research protocols for the baseline data collection for evaluation of the UCC interventions. While this delayed N/CRSP-Africa's ability to start generating field data-based analyses and publications, this time was used to improve the study design (by inclusion of comparison districts) and to field test data collection protocols and instruments. By the end of Y2 (FY 2012), primary field data collection had begun and the research agenda was moving forward rapidly.

**Countries with Current Activity:** N/CRSP-Africa is active in Uganda and Malawi. It also supports short-term trainings in India for qualified Ugandans.

**Other Key Partners:** Key US partners include Harvard University, Tuskegee University, Purdue University, Johns Hopkins University, and Development Alternatives, Inc. Ugandan partners include Makerere University; FHI360 and its UCC consortium partners in the Uganda Community Connector; IFPRI; and Gulu University. Key partners in Malawi include Bunda Agricultural College, the Office of the President, and the Ministry of Health.

## 9. N/CRSP-Africa Story

**By Kamaremba Federesi, MSc Student of Applied Human Nutrition, Makerere University, Uganda**

“Without Nutrition CRSP-Africa support, it would have been very difficult for me to undertake the study **“Influence of Nutrition Education about Vitamin A on Nutrition Knowledge and Practice of Rural Pregnant Women in Ibanda District.”** This study not only brought me in contact with pregnant women in Ibanda in western Uganda but our interaction has helped me learn a lot about their feeding habits. During the baseline survey I found out that most women did not know about vitamin A and had not taken sufficient vitamin A in the previous last few weeks, surprisingly since there is vitamin A rich food in their communities. I therefore suspect that the low intake is due to lack of knowledge about vitamin A.”



“Preliminary results from follow-up studies after nutrition education indicate that the women are slowly adapting to nutrition practices that increase their vitamin A intake. They have

learned how to identify vitamin A-rich food within their communities and can even follow the right procedure of preparing vitamin A meals. Following the knowledge of about importance of vitamin A, women are promising to take up the growing of vitamin A foods alongside other crops. Generally, the pregnant women I have interacted with are appreciative of this training and still wish the training could be extended to cover a very big group. CRSP has therefore not only assisted me to conduct this study but it is slowly influencing the lives of communities in Ibanda particularly pregnant women.”

- **Kamaremba Federesi**

USAID’s Nutrition Collaborative Research Support Program (CRSP) – Africa is building human and institutional research capacity in Uganda. It funds the research projects of students enrolled in Agriculture, Nutrition, and Public Health degree programs. Many of the supported students, like Ms. Federesi, have already completed their MSc or MPH classwork but lack the additional resources for their required field research projects and thus cannot complete their degrees. With Nutrition CRSP funding, they are able to conduct their field research, enhancing research capacity and gaining experience, and enter the workforce with a completed University degree relevant to national priorities and to USAID’s Feed the Future initiative.

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## Appendix 1: BoD and TAC Minutes

### Minutes

**Third Meeting of the Board of Directors  
Nutrition Collaborative Research Support Programs (Nutrition CRSP)  
June 2012  
Holiday Inn Mayfair, London, UK**

**Present:** Eileen Kennedy, Patrick Webb, Will Masters, Christopher Duggan, Jeffrey Griffiths, Keith West, Rolf Klemm, Eunice Bonsi, Maura Mack, Pascasie Adedze, Nilupa Gunaratna

#### 1. Welcome and Opening Comments

1.1 **Patrick Webb and Jeffrey Griffiths** welcomed the Board of Directors and reported on the momentum and visibility of the Nutrition CRSP.

1.2 **Maura Mack**, as the new AOR, also welcomed the group and reported that USAID is pleased with the progress of N/CRSP in both Africa and Asia and expressed gratitude to Tufts and the N/CRSP team, and looked forward to a productive relationship. She also introduced **Pascasie Adedze** who, while still undergoing AOR training, has already become an active part of the team.

#### 1.3 Procedures (Webb)

1.3.1 Reviewed previous minutes from BoD meeting and opened the meeting to any comments. Motion made by Will Masters to adopt the minutes and seconded by Keith West. BoD unanimously approved minutes.

1.3.2 Reviewed and approved the day's agenda.

#### 2. Report on BIFAD review of CRSP modality

2.1 Following a very brief overview of Year 1 global activities of the Nutrition CRSP, **Webb** and **Griffiths** reported on the external review of CRSPs commissioned by BIFAD at the request of the USAID administrator. The review seeks to understand how well the CRSP modality for engagement with US universities for research on developing country-relevant topics is working today (roughly 30 years after inception). The review team has been undertaking an assessment of all aspects of all CRSP activities. It was reported that some CRSP MEs have assumed that an alternative model is likely to be proposed and that this may represent the end of the CRSP 'as we know it.' Others feel that this is an opportunity to present CRSP strengths and widen awareness of how well CRSPs perform with limited funding. Interviews with the Nutrition CRSP ME personnel have been very productive and collaborative in nature, rather than critical. Key points raised included: a) how closely CRSPs are working with local missions; b) whether cost-effectiveness of CRSP activities has been demonstrated; and c) whether the model of having a few universities with long-term CRSP contracts make sense. A draft report is due in August 2012.

**2.2** In this context, it was suggested that the N/CRSPs make a more concerted effort to link with other CRSPs to achieve wider understanding of how their various research foci are collectively linked to overall USAID goals. A motion was tabled and voted on (see **Resolution 1, Annex 1**).

**2.3 Webb** shared that a recent draft of the US Senate version of the Farm Bill has \$32 million dedicated to CRSP research. He also shared that CRSP awareness-raising activities are now focused around an NGO (called Cultural Practice) based in Washington, DC which has been retained by the CRSP Council to lobby on CRSP's behalf. Deborah Rubin (former post-doc of Eileen Kennedy) is director (see <http://www.culturalpractice.com/>). He also mentioned that he had given presentations on the overall Nutrition CRSP research agenda at USAID and at the World Bank, aiming to build a network of intellectual partners and donor supporters.

### **3. Updates on program implementation - Africa**

**3.1 Jeffrey Griffiths** offered an update on progress since the last BoD meeting in establishing a presence in Uganda, connections with the USAID mission, Community Connector and other partners in the country.

### **4. Updates on program implementation - Asia**

**Patrick Webb** reported on progress in relation to Nepal:

**4.1** He noted that the process has been slow but steady—delays in rolling out the USAID Suaahara program (formerly INP) led to delays in rolling out the baseline data collection (for which IFPRI was commissioned). N/CRSP has been a key part of the collaborative group working together on baseline methodology and instrument preparation. Intensive discussions during March led to the conclusion that N/CRSP could not (as previously intended) link closely with IFPRI in terms of research sites (because the needs of the baseline data collection/impact assessment do not match the needs of the N/CRSP for randomization, greater spatial coverage of agroecologies across the country, and greater openness to non-Suaahara interventions). As a result, the N/CRSP will design its own sample frame, while still based household-level surveys on the core instruments used by IFPRI to allow for comparability in interpreting results. It was pointed out that while N/CRSP in Nepal will indeed be able to research process as well as impact of Suaahara implementation, it will go far beyond that and be able to speak more broadly about a variety of government and other donor intervention types and approaches. In this context, a motion was tabled to encourage the N/CRSPs to play an active role in global discussions on the search for relevant metrics of integrated programming and the leveraging of agriculture for nutrition (see **Resolution 2, Annex 1**).

**4.2** An N/CRSP-Asia office has now been firmly established within the headquarters of Helen Keller International in Kathmandu. Relations with HKI are good, the latter providing financial and administrative support, as well as physical space. Since HKI are a key partner in Suaahara, this allows for good entrée to ongoing discussions with core partners. N/CRSP has notional office space also in NTAG, but we have not utilized it much to date.

- 4.3 GoN (Government of Nepal) has established a formal advisory technical committee (Nepal TAC) to advise the Nutrition CRSP and, potentially, to oversee all research in the country relating to research on integrated programming relation to nutrition. A first meeting of the N-TAC was held in Kathmandu in May 2012.
- 4.4 The focus of the rest of Y2 of the N/CRSP in Asia will be to finalize research design for Nepal, and push forward with an RFA for field data collection, and clearance of survey instruments through IRBs in the US and Nepal. MOUs are expected to be finalized with the Child Health Division of Ministry of Health, with the Institute of Medicine (as the local academic partner for N/CRSP), with Suaahara (as a program partner also funded by USAID), and also with Heifer International (as part of a widening of the stakeholder network of collaborators in field research).

## 5. Update on Associate Awards

- 5.1 **Griffiths** shared that in addition to the early Associate Award from Mali (conducted in December 2010 and into 2011 on the strategic position of nutrition in the country's Feed the Future plan), there have been additional discussions with Mali on the themes of exclusive breast feeding, complementary foods, iron/folate and malaria prevention.
- 5.2 Additional Associate Awards activity is likely with Malawi. Over a three-year period, the ME will lead on capacity building with the agricultural college, curriculum design, food composition table creation, etc.). There is talk of support for a country-wide BCC campaign on exclusive breast feeding and quality complementary foods.
- 5.3 There are also discussions on potential Associate Awards with Ghana, Ethiopia and Bangladesh, although each of these is only at the exploration stage. **Griffiths** and **Kennedy** pointed out that ENGINE (Empowering New Generations in Improved Nutrition and Economic Opportunities: <http://ethiopia.usaid.gov/programs/global-health-initiative/projects/empowering-new-generations-improved-nutrition-and-economi>) is another USAID-funded initiative just starting in Ethiopia. Tufts University plays a core role in that new activity which deals with many of the same issues as N/CRSP. As a result, it makes sense to try to collect data in similar ways such that Ethiopia becomes a comparison country.

## 6. Capacity-Building Activities

- 6.1 **Webb** reported that for Asia, a successful Scientific Symposium was held in Kathmandu at the end of March 2012 (co-hosted by the N/CRSP and the Institute of Medicine of Nepal). The intent was not simply stakeholder discussion, but establishing a process of scientific endeavor in the country, with calls for abstracts, online registration, and reviewed presentations. The two-day meeting had full participation of more than 150 people, active dialogue, and strong agreement that this should be an annual event. Thanks are due to the JHU team for the efforts in making this work.
- 6.1.1 Training activities have proceeded well in Nepal. In addition to the seven Nepalese students recruited for the Harvard-Tufts-St. John's training in Bangalore in January 2012, several students have been recruited for summer trainings at JHU and Harvard, the two MS students at Tufts continue to do well,

and doctoral students have been recruited by Purdue and Tufts for the Fall 2012 semester. A grant proposal writing workshop has been organized (in collaboration with the Institute of Medicine) for August 2012 in Kathmandu. In this context, several motions were put to the vote on priority selection criteria for individuals seeking N/CRSP support for appropriate training and degree-programs (see **Resolutions 3 and 4, Annex 1**).

6.1.2 **Griffiths** reported on a workshop held in Jinja, Uganda at the end of March 2012. N/CRSP-Africa hosted the two-and-a-half day workshop that aimed to develop a clear understanding of research design and analyses of large-scale integrated nutrition, health and agriculture programs. More than 40 participants attended including stakeholders from line ministries and district officials (health, agriculture and gender), USAID Uganda, international and national NGOS, USAID Community Connector program, IFPRI, IPA, VEDCO, BRAC Uganda and Makerere, Gulu, Kyambogo and Mbarara universities. Participants were introduced to the Community Connector program as well as to the concepts of impact, process evaluations and program impact pathways, and developing research design using epidemiological and econometric methods. A review of research studies ranging from cross sectional to randomized controlled interventions and longitudinal cohort studies were provided. Discussions were held with district officials on the barriers and facilitators of program implementation and implementation research. The workshop was interactive and allowed students and faculty, line ministry and district officials to understand the importance of research design and methodology in developing an evidence base for future policy and programming around health, nutrition and agriculture in Uganda.

6.2 An important issue relates to criteria for selection of individuals from N/CRSP countries to benefit from short or long-term training activities under CRSP auspices. While such criteria have not typically been formally codified and made public by other CRSPs, it is felt that N/CRSP needs to have transparent criteria to apply to the many forms of support on offer. **Webb** committed the ME to coming up with draft criteria for selection, for comment by BOD members before the end of Y2.

## 7. Brief Partner Reports

### 7.1 Johns Hopkins University

7.1.1 **Keith West** explained that JHU was working mainly in Nepal for N/CRSP, and had: a) moved to the design and costing phase for fieldwork (the intent being to have a formal research proposal out in the form of an RFA, for a data collection company, by September 2012). The decision to steer away from 100% co-location with IFPRI's baseline surveys has led to a much better research design for CRSP purposes; b) one person has been hired to be based in Nepal (Sweta Manohar) and work alongside the ME's Diprav Sapkota to

facilitate JHU activity on the ground; and c) considerable effort paid off in the success of the Scientific Symposium.

## 7.2 **Purdue University** was not represented at the BoD.

7.2.1 As a result, **Griffiths** reported that **Jerry Shively** has been directly involved in ongoing discussions with the Peanut CRSP and others on the potential for Uganda-based research relating to aflatoxins. There was discussion around questions like whether aflatoxin exposure was responsible for inflammation during pregnancy, anemia, child stunting. **Keith West** shared that JHU has some data among pregnant women in Nepal where levels seem significantly higher than in past African studies. **Webb** will pursue the potential for collaboration on the Nepal data. East African USAID will possibly allow us to measure aflatoxin in our cohort studies in Uganda.

7.2.2 **Webb** also reported that **Shively** participated in the March 2012 Scientific Symposium in Nepal, and was engaged in N/CRSP discussions both with IFPRI and Suaahara on research design, and with the Mission. It is likely that Purdue will engage with the Asia N/CRSP primarily in relation to analysis of secondary data to answer key questions. Already they have prepared (regression-ready) data from the 2006 and 2011 DHSs for Nepal, and are linking these to national consumption surveys and GIS-linked data on agroecology and climate. Close interaction between Purdue and Tufts on such analyses is anticipated.

## 7.3 **Tuskegee University**

7.3.1 **Eunice Bonsi** explained that she is still interacting with academic partners in Nepal and Uganda to try to bring students into the US for fields of study relevant to the N/CRSP objectives. She is hoping to have a good crop in Y3. She herself has remained active in the online discussions around research design, and was looking forward to the upcoming LICRAH-N/CRSP workshop.

## 7.4 **Harvard School of Public Health**

7.4.1 In Nepal, Harvard School of Public Health has focused its activities in Bhaktapur district, seeking to analyze data on mother-infant pairs and establish a follow-up survey that will allow them to consider dietary trends in a peri-urban location, and how diet and nutrition/health outcomes match up over time. Data analysis has already started and new data collection will be undertaken prior to the end of 2012.

## 7.5 **DAI** were not represented at the BoD meeting.

7.5.1 DAI has identified partners to conduct an assessment of market potential for quality low-cost complementary food production in various parts of Nepal, including a qualitative assessment of why opportunities have not been taken to work with entrepreneurs in local complementary food production. They also see the need to conduct value-chain assessment. A draft report is due by September 2012.

## 8. Research Publications and Dissemination

8.1 Webb raised the idea of a formal MOU among CRSP partners to establish data sharing and rules for co-authorship up front. The matter was discussed and the opinion was that a formal additional agreement was unnecessary since all core partners of N/CRSP feel that they are bound by the partnership to share data and seek appropriate co-authorship as part of the N/CRSP. It was also agreed that more formal MOUs with non-core partners would be important to ensure protection of/access to data as appropriate (for example with IFPRI), and to ensure local collaborator co-authorship as far as possible on all CRSP-related research publications.

## 9. Communication of CRSP Activities

9.1 There was discussion of the N/CRSP website, the prevailing opinion being that the site is not sufficiently flexible to meet existing or future needs. Nor are updates made fast enough. It was widely agreed that a more dedicated web-management is required. The ME was tasked with pushing improvements on a priority basis, and to consider an additional technical hire to support such activity for Y3.

9.2 The fact that no policy briefs have yet been finalized was raised. It was reported by **Webb** that the template suggested by JHU had elicited much discussion. The design issues have been more or less resolved (logos and references to CRSP, etc., on the front cover). There is also agreement that such policy briefs should be focused on policy-relevant issues core to the CRSP (integrated programming, leveraging agriculture for nutrition, best practice in nutrition interventions, etc.) rather than cover generic nutrition and health issues already published elsewhere.

9.3 There was discussion around the question of whether all BoD members should review drafts of policy briefs or working papers carrying the N/CRSP name. It was decided that prior to making any products public, the ME will alert BoD members and offer them the opportunity to review and make comments, but that a formal all-BoD review of drafts is unnecessary. At the same time, the Board took it upon itself to be the peer-review body with regard to formal publications deriving from N/CRSP research. A motion was made to establish this principle (see **Resolution 5, Annex 1**).

## 10. Administrative Business

10.1 **Maura Mack** presented a list of issues relating to use of TraiNet (for registering of foreign students). She offered to (re)send information by email on requirements and process. She reiterated the importance of ensuring that all necessary data be entered in a timely fashion.

There being no additional business, the meeting was adjourned at 5:10PM

**Annex 1 (for the Minutes)**  
**Resolutions of the Third Meeting of the Board of Directors of the Nutrition CRSP**

1. The Nutrition CRSPs should seek to engage with other CRSPs as appropriate to promote greater understanding of the important interfaces between public health, nutrition and agriculture, and with food systems more broadly.  
(Motion proposed by Eileen Kennedy, seconded by Chris Duggan). Approved unanimously.
2. Recognizing the catalytic role played thus far by the Nutrition CRSPs in furthering the cross-disciplinary agenda framed by USAID’s Feed the Future policy, the Nutrition CRSPs should seek to play an active role in the defining of common metrics for assessing the contribution of agriculture to nutrition goals, and the mechanisms by which impacts are achieved.  
(Motion proposed by Keith West, seconded by Jeffrey Griffiths). Approved unanimously.
3. The Nutrition CRSP should prioritize its capacity-building activities (degrees, short-course training, workshops, etc.) toward appropriately-qualified nationals from government service, academia, and Think Tank institutions, as well as professionals working in fields related to nutrition, public health or agriculture in national research centers and appropriate non-governmental organizations. Individuals from such institutions supported for any such capacity-building should work in, or seek study leading toward, fields directly related to the goals and mandate of the N/CRSP.  
(Motion proposed by Will Masters, seconded by Chris Duggan). Approved unanimously.
4. The Board of Directors of N/CRSP tasks the ME to establish clear criteria for the selection of individuals for each form of capacity-building, including approaches to recruitment, basis for selection, and post-training requirements of successful candidates. Additional guidelines will specify the role of N/CRSP in supporting successful training and post-training career growth.  
(Motion proposed by Keith West, seconded by Eileen Kennedy). Approved unanimously.
5. The Board of Directors of N/CRSP will assume responsibility for examining proposals for peer-reviewed publications deriving from N/CRSP research. The Board tasks the ME to establish criteria for co-authorship, including, but not restricted to, CITI certification, and the nature of ‘substantive contribution.’  
(Motion proposed by Will Masters, seconded by Rolf Klemm). Approved unanimously.

## Minutes

### Third Meeting of the Technical Advisory Committee Nutrition Collaborative Research Support Programs (Nutrition CRSP)

June 2012

Holiday Inn Mayfair, London, UK

**Present:** Eileen Kennedy, Patrick Webb, Will Masters, Christopher Duggan, Jeffrey Griffiths, Keith West, Rolf Klemm, Shibani Ghosh, Eunice Bonsi, Maura Mack, Pascasie Adedze, Richard Deckelbaum, Shakuntala Thilsted, Nilupa Gunaratna

#### 1. Welcome and Opening Comments

1.1 **William Masters** and **Shibani Ghosh**, chairing the meeting, welcomed the members of the Technical Advisory Committee (TAC)

1.2 **Maura Mack**, as the new AOR, also welcomed the group and reported that USAID is pleased with the progress of N/CRSP in both Africa and Asia and expressed gratitude to Tufts and the N/CRSP team, and looked forward to a productive relationship. She also introduced **Pascasie Adedze** who, while still undergoing AOR training, has already become an active part of the team.

#### 1.3 Review of Agenda

1.3.1 **Patrick Webb** reviewed the day's agenda (which received approval) and briefly presented on discussions and decisions taken by the BoD the day earlier. These were summarized as: i) promoting close interaction between Nutrition CRSP and the other CRSPs to enhance understanding of cross-sectoral linkages; ii) moves toward defining common metrics for understanding links among agriculture, health and nutrition; iii) a need to better define priorities in seeking and selecting candidates for N/CRSP supported trainings; and iv) issues relating to data sharing and authorship. The BoD agreed to oversee paper ideas. It was noted that five BoD resolutions were approved on these issues during the day.

#### 2. Overview of Activities in Africa

2.1 **Jeffrey Griffiths, Shibani Ghosh, Nilupa Gunaratna and Chris Duggan** all offered updates on progress since the last TAC meeting in establishing a presence in Uganda, connections with the USAID mission, Community Connector and other partners in the country. Community Connector (USAID-funded effort) has met with district leaders and National Agricultural Advisory Services program (NAADS) of Uganda, Chief Medical Officers, etc. to assess each community's specific needs and designing individualized intervention. It is the effectiveness of these interventions that N/CRSP is designed to measure. The N/CRSP plans to work in both north and southwest Uganda, which differ in terms of rates of undernutrition, anemia, and agriculture. Discussion centered on whether or not to focus on process variables (input, throughput and output variables) more than outcome variables (e.g., rates of stunting,

anemia), especially due to the limited cluster size and highly variable number of interventions.

2.2 **Jeff Griffiths** also shared that in addition to the early Associate Award from Mali (conducted in December 2010 and into 2011 on the strategic position of nutrition in the country's Feed the Future plan), there have been additional discussions with Mali on the themes of exclusive breast feeding, complementary foods, iron/folate, malaria prevention. Additional Associate Award activity is likely with Malawi. Over a three-year period, the ME will lead on capacity building with the agricultural college, curriculum design, food composition table creation, etc. There is talk of support for a country-wide BCC campaign on exclusive breast feeding and quality complementary foods. And there are discussions on potential Associate Awards with Ghana and Ethiopia.

### 3. Overview of Activities in Asia

3.1 **Patrick Webb** reported on progress in relation to Nepal. He noted that process has been steady and collaboration with many stakeholders in the country has strengthened. He elaborated on the study design, with JHU leading a 21 district annual household survey (complemented by intra-annual data collection in three of those sites), dovetailing with Tufts research on process from ward level up to central level. This approach is uncoupled from the original idea of linking with the Suaahara project baseline (to be implemented by IFPRI). It frees N/CRSP to stratified random sampling that allows N/CRSP to capture process, uptake and outcomes in the USAID implementation locations, but also allows the same to be understood in future FfF sites, national government multi-sector nutrition plan sites, World Bank-supported conditional cash transfer sites, Heifer International sites and Winrock aquaculture sites. In other words, the research will be much richer and more able to generalize about implementation processes than otherwise might have been the case.

3.1.1 Patrick reported that the Government of Nepal has established a formal Advisory Technical Committee (Nepal TAC) to advise the Nutrition CRSP and, potentially, to oversee all research in the country relating to research on integrated programming relation to nutrition. A first meeting of the N-TAC was held in Kathmandu in May 2012.

3.1.2 **Rolf Klemm** and **Keith West** made a presentation with more details of the sampling approach, the links with IFPRI survey instruments, and intent of repeat surveys of households in 21 districts. Field data collection is expected to start later in 2012. Keith also reported on the potential for collaborating with JHU research on aflatoxin exposure in blood samples taken in Sarlahi in the 1980s. He also demonstrated new approaches to identifying micronutrient deficiencies derived from a panel of plasma samples.

### 4. Capacity-Building Activities.

4.1 **Webb** reported that for Asia, a successful Scientific Symposium was held in Kathmandu at the end of March 2012 (co-hosted by the N/CRSP and the Institute of Medicine of Nepal). The intent was not simply stakeholder discussion, but

establishing a process of scientific endeavor in the country, with calls for abstracts, online registration and reviewed presentations. The two-day meeting had full participation of more than 150 people, active dialogue, and strong agreement that this should be an annual event. Thanks are due to the JHU team for the efforts in making this work.

4.1.1 In addition to the seven Nepalese students recruited for the Harvard-Tufts-St. John's training in Bangalore in January 2012, several students have been recruited for summer trainings at JHU and Harvard, the two MS students at Tufts continue to do well and doctoral students have been recruited by Purdue and Tufts for the Fall 2012 semester. A grant proposal-writing workshop has been organized (in collaboration with the Institute of Medicine) for August 2012 in Kathmandu.

4.2 **Griffiths** reported on a workshop held in Jinja, Uganda at the end of March 2012. N/CRSP- Africa hosted the two-and-a-half day workshop that aimed to develop a clear understanding of research design and analyses of large-scale integrated nutrition, health and agriculture programs. More than 40 participants attended, including stakeholders from line ministries and district officials (health, agriculture and gender), USAID Uganda, international and national NGOS, USAID Community Connector program, IFPRI, IPA, VEDCO, BRAC Uganda and Makerere, Gulu, Kyamboga and Mbarara Universities. Participants were introduced to the Community Connector program as well to the concepts of impact, process evaluations and program impact pathways and developing research design using epidemiological and econometric methods. A review of research studies ranging from cross-sectional to randomized, controlled interventions and longitudinal cohort studies were provided. Discussions were held with district officials on the barriers and facilitators of program implementation and implementation research. The workshop was interactive and allowed students and faculty, line ministry and district officials to understand the importance of research design and methodology in developing an evidence base for future policy and programming around health, nutrition and agriculture in Uganda.

## 5. **Communication of CRSP Activities**

5.1 There was discussion of the N/CRSP website, the prevailing opinion being that the site is not sufficiently flexible to meet existing or future needs. It was widely agreed by the TAC that a more dedicated web-management is required.

5.2 There was discussion of potential for interaction with the US academies of science on approaches to defining common metrics for integrated agriculture-health and nutrition processes and outcomes. The idea was floated by Richard Deckelbaum that IOM might be interested in convening a working group or a meeting to discuss such issues. The idea of a 'think piece' on analytical linkages among these sectors was proposed by Will Masters. Both ideas were enthusiastically taken up by the TAC and will be discussed further in the context of the upcoming workshop hosted by LCIRAH in June.

There being no additional business, the meeting was adjourned by Will Masters at 5:35PM

## Appendix 2: Nutrition CRSP - Africa Leadership, 2011/12

<b>Core Management Team</b>	<b>Position</b>	<b>Institution</b>	<b>Email Address</b>
Patrick Webb	Program Director	Professor and Academic Dean, Friedman School of Nutrition, Tufts	Patrick.Webb@tufts.edu
Eileen Kennedy	Co-Program Director	Professor and Dean, Friedman School of Nutrition, Tufts	Eileen.Kennedy@tufts.edu
Shibani Ghosh	Associate Director, Technical	Assistant Professor, Friedman School of Nutrition, Tufts	Shibani.Ghosh@tufts.edu
<b>Out - Paul Giguere</b>	<b>Associate Director, Communications</b>	<b>Assistant Professor, Friedman School of Nutrition, Tufts</b>	<b>Paul.Giguere@tufts.edu</b>
Diplav Sapkota	Local Coordinator, Nepal	Friedman School of Nutrition, Tufts	Diplav.Sapkota@tufts.edu
Liz Marino-Costello	Program Manager, Global	Program Manager, Friedman School of Nutrition, Tufts	Elizabeth.Marino-Costello@tufts.edu

<b>Board of Directors</b>	<b>Position</b>	<b>Institution</b>	<b>Email Address</b>
Patrick Webb (co-chair)	Program Director, Asia	Professor and Academic Dean, Friedman School of Nutrition, Tufts	Patrick.Webb@tufts.edu
Jeffrey Griffiths (co-chair)	Program Director, Africa	Associate Professor School of Medicine, Tufts	Jeffrey.Griffiths@tufts.edu
Wafaie Fawzi	Core Partner Representative	Professor of Nutrition, School of Public Health, Harvard	mina@hsph.harvard.edu
Keith West	Core Partner Representative	Professor of Infant & Child Nutrition, School of Public Health, Johns Hopkins	kwest@jhsph.edu
Eunice Bonsi	Core Partner Representative	Research Associate Professor, Department of Food & Nutritional Science, Tuskegee	ebonsi@tuskegee.edu
Gerald Shively	Core Partner Representative	Professor of Agricultural Economics, Purdue	shivelyg@purdue.edu
Eileen Kennedy (ex officio)	Co-Program Director	Professor and Dean, Friedman School of Nutrition, Tufts	Eileen.Kennedy@tufts.edu
Will Masters (ex officio)	Co-Program Director, Africa	Professor of Food Policy, Friedman School of Nutrition, Tufts	William.Masters@tufts.edu
Shibani Ghosh (ex officio)	Associate Director, Technical	Assistant Professor, Friedman School of Nutrition, Tufts	Shibani.Ghosh@tufts.edu
In-Maura Mack (ex officio)	Agreement Officer's Representative (AOR)	Nutrition Advisor, USAID	mmack@usaid.gov
Out -Cheryl Jackson (ex officio)	AOR	Senior Nutrition and Health Advisor, USAID	chejackson@usaid.gov
In- Vern Long (ex officio)	Alternate AOR	Senior International Agriculture Research Advisor	jlong@usaid.gov
In-Pascasie Adedze (ex officio)	Activity Manager	Nutrition Advisor, USAID	padedze@usaid.gov

<b>Technical Advisory Committee</b>	<b>Position</b>	<b>Institution</b>	<b>Email Address</b>
Jeff Griffiths (co-chair)	Program Director, Africa	Associate Professor, School of Medicine, Tufts	Jeffrey.Griffiths@tufts.edu
Shibani Ghosh (co-chair)	Associate Director, Global	Assistant Professor, Friedman School of Nutrition, Tufts	Shibani.Ghosh@tufts.edu
Chris Duggan	Core Partner Representative	Associate Professor of Nutrition, School of Public Health, Harvard	christopher.duggan @childrens.harvard.edu
Rolf Klemm	Core Partner Representative	Johns Hopkins	rklemm@jhsp.edu
Jerry Shively	Core Partner Representative	Purdue	shivelyg@purdue.edu
Eunice Bonsi	Core Partner Representative	Tuskegee	ebonsi@tuskegee.edu
Barbara Seligman	Core Partner Representative	Technical Area Manager   Health, Development Alternatives, Inc.	Barbara_Seligman@dai.com
Shakuntala Thilsted	External Advisor	Senior Nutrition Advisor, WorldFish Center, Bangladesh	sht@life.ku.dk
Out- Boitshepo Giyose	External Advisor	Senior Nutrition Advisor, African Union/NEPAD	bibig@nepad.org
Richard Deckelbaum	External Advisor	Director, Institute for Human Nutrition, Columbia University	rjd20@columbia.edu
Victoria Quinn	External Advisor	Senior Vice President, Helen Keller International	vquinn@hki.org
Ruth Oniang'o	External Advisor	Founder and Director, Kenya Rural Outreach Programme (ROP)	oniango@iconnect.co.ke
Ram Shrestha	External Advisor	Founder and Director, Nepalese Technical Advisory Group (NTAG)	ramntag@gmail.com
Shelley Sundberg	External Advisor	Senior Program Officer, Bill and Melinda Gates Foundation	Shelley.Sundberg@gatesfoundation. org
In-Mary Bassett	External Advisor	Doris Duke Foundation	mbassett@ddcf.org
Out-Ellen Harris (ex officio)	USAID/USDA	Associate Director, Beltsville Human Nutrition Research Center	ellen.harris@ars.usda.gov
Out-Cheryl Jackson (ex officio)	AO Technical Representative	Senior Nutrition and Health Advisor, USAID	chejackson@usaid.gov
In-Maura Mack (ex officio)	Agreement Officer's Representative (AOR)	Nutrition Advisor, USAID	mmack@usaid.gov
In-Vern Long (ex officio)	Alternate AOR	Senior International Agriculture Research Advisor	jlong@usaid.gov
In-Pascasie Adedze (ex officio)	Activity Manager	Nutrition Advisor, USAID	padedze@usaid.gov

## **Appendix 3: Work Plan, Malawi Associate Award**

### **Introduction**

Within the context of nutrition and targeting nutrition problems, Malawi has been in the forefront. While programs to tackle acute malnutrition using community-based strategies (CMAM) have been scaled up (75% coverage as per UNICEF), significant gaps remain in the public health arena around preventative nutrition. The 2010 DHS report indicates a reduction in the number of wasted and stunted children, however, almost half of the children under five are still stunted (1). A key strategy of the Government of Malawi (through the Department of Nutrition and HIV/AIDS, Office of the President and Cabinet) has been to develop nutrition prevention interventions targeting the first 24-months period of the life cycle. These interventions include maternal nutrition, infant and young child feeding practices, water, sanitation and hygiene. They are within the National Nutrition Policy and Strategic Plan of Malawi released in 2010. The Government of Malawi (in association with UNICEF) and other donors (Irish Aid, USAID, World Bank, CIDA) is in the process of scaling up a National Nutrition Education and Communication Strategy (NECS) as part of the implementation of “Scaling Up Nutrition,” or 1,000 days initiative.

In contrast an emerging trend in Malawi is the increased risk of overweight and obesity. A review of the DHS 2010 indicates that 28% of urban women aged 15-49 are either overweight or obese compared to 14% of rural women. A preliminary literature review shows that chronic non-communicable diseases and their risk factors are emerging public health problems. A recently published study examined the prevalence of smoking, alcohol consumption, overweight and obesity, hypertension, fasting blood glucose, and cholesterol levels. It found a third of the adult population aged 25-64 years either had elevated blood pressure or were on anti-hypertensive medications, 5.6% had raised fasting blood glucoses (hyperglycemia) or were taking medication for it, and 8.7% had high cholesterol values (2). Another study has reported prevalence rates of 13.6% for diabetes mellitus, 4.4% for ischaemic heart disease, and 6.1% for strokes in the adult population aged 30-69 years (3).

Within this context, a key concern raised by the DNHA (OPC) is the lack of capacity around nutrition (both pre-service and in-service). There is a lack of trained nutritionists and dietitians required for the roll out of nutrition prevention activities at scale. Another major concern at the Nutrition Unit of the Ministry of Health (which has the nutrition mandate within the health sector) is the weak nutrition education curriculum for health workers. While there have been significant changes at the policy and program level (e.g. scaling up of CMAM, food by prescription, introduction of new growth standards, infant and young child feeding promotion activities), this is not reflected in the current curriculum of the nursing and medical colleges. Graduating students often have very little or no experience in current community and facility-based activities that require significant nutrition knowledge. Thus, the MOH has to re-train or provide remedial training to health care professionals. Furthermore, since health workers and paramedics do not often have long-term fixed postings, incoming new untrained workers require repetitive in-service training. Thus repetitive remedial training has to be constantly provided, and is a significant burden. Thus, if relevant nutrition training can occur during pre-service education,

this would: (1) allow for a better prepared workforce attuned to the current policies and practices of the MOH; and (2) decrease the burden of repetitive, remedial training of health care graduates.

The aim of this activity is to: build pre-service training capacity in Malawi through guiding the modification of existing curriculum with a focus on developing a dietetics curriculum and program, sensitive to national needs and priorities; to review the existing medical and nursing curriculum for nutrition content; and to develop capacity for implementing food and nutrition activities (e.g. surveillance and consumption surveys).

## **Objectives**

Build pre-service capacity through curricular development, support for faculty and students around nutrition and dietetics.

Align the nutrition components of current nursing and medical curricula to harmonize with national priorities and nutrition actions.

Outline a plan of action and a proposal for developing capacity leading to the production of local food composition tables.

## **Activities**

The Nutrition CRSP will achieve the objectives through several activities. The institutional focus of the pre-service training will be primarily Bunda College of Agriculture, which has a Department of Home Economics and Human Nutrition. The clinical medicine and nursing curricula will be reviewed for nutrition content in collaboration with Concern Worldwide, the Ministry of Health, the CTC Advisory Service (CAS) and the Department of Nutrition and HIV/AIDS. We anticipate that the development of the activity around the production of food composition tables will be in collaboration with the Bunda College of Agriculture.

### **I. Bunda Agricultural College and Capacity Building: Nutrition & Dietetics**

**Initial Stakeholder Engagement.** Initial consultations assisted development of this activity in the Work Plan. It was discussed extensively with members of the Department of Home Economics and Human Nutrition (“BUNDA”) and principals of the N/CRSP-Africa (N/CRSP) with input from key stakeholders February 6-10, 2012. These included: Dr. Mary Shawa, Principal Secretary in the Department of HIV/AIDS and Nutrition in the Office of the President and Cabinet; nutritionists within the Ministry of Health; potential employers and stakeholders such as Feed the Children, Concern and UNICEF; and USAID/Malawi (Ms. Violet Orchardson).

#### **Input and Observations Guiding This Activity: Initial Situation Analysis.**

Multiple stakeholders noted the lack of nutrition human capacity in Malawi. Few educational institutions teach nutrition in depth. Bunda Agricultural College is the main nutrition education institution in Malawi. The consensus view was that the curriculum at Bunda College will benefit from updating and revising, given advances in nutrition knowledge and practice. Undergraduate syllabi include references from the 1980s. An MSc program was developed in the 1990s and its

curriculum is also due for review. Notably, many key informants spoke of missed opportunities for students to have their theoretical training complemented by practical, hands-on education.

Current delivery of nutrition courses is primarily via traditional 'instructor to student' lectures. Organizational innovations, which could save faculty time, provide students with enhanced mentoring and teaching experiences, and improve education have not yet been adopted. Barriers to accessing course materials (limited references, limited internet access, etc.) exist.

Undergraduate students are not routinely involved in internships or research activities, which would provide practical knowledge regarding nutrition. Internet access to international nutrition discourse has not been optimized.

No academic dietetics program exists in Malawi. BUNDA has developed a preliminary course list for a Dietetics Program but has not as yet developed the content, curricular objectives, syllabi, desired student skill sets, desired program graduate competencies, equipment and faculty needs; nor has stakeholder input been fully assessed. A formal needs assessment, which would include current assets and gaps (human, physical, structural and organizational) has not yet been conducted. Thus, substantial opportunities exist for the development of a dietetics program. In initial analyses, the Nutrition CRSP has created a table of gaps (Table 1).

Table 1: Findings of initial analyses of gaps

	Gaps	Preliminary Observations – February Discussions
2A	Faculty Capacity in Dietetics	Most of the current Department of Home Economics and Human Nutrition faculty are not trained dietitians. The existing few will be greatly stretched. Other faculty should have additional training or exposure to dietetics to improve their capacity. A dietitian may need to be recruited to oversee the success of the program over the long run and provide leadership to a person in the field.
2B	Teaching Loads Limit Time for Program Development	Faculty have had their teaching loads ~ tripled over the past 5 years. Classes are being taught in blocks twice daily, no teaching assistants (such as the MSc students) are utilized, and thus less time is available for activities relating to dietetics program development.
2C	Faculty Access to Information	Faculty do not consistently have access to latest information/global thinking in dietetics. Internet access is slow and they have little time given their teaching load. Some courses in BSc and MSc which may be used for the Dietetics Program list references > 30 years old. Revision of specific lectures takes approximately 3-5 hours per 1 hour of teaching time. Faculty has not enjoyed contact with their peers at workshops or conferences with a focus on dietetics. Within the Tufts Scope of Work we will identify key recommended actions.
2D	Need to Develop New Courses or Adapt Current Ones	Faculty may have to either develop new, or adapt current, courses for use by the dietetics program. Some courses may be readily adaptable. Some courses for BSc and MSc (as noted above in <b>Context</b> ) require updating before they can be considered for new dietetics program. Example of new course required: Psychology of providing dietary advice.
2E	Laboratory Training for Students	Dietetic students will require laboratory training as part of their curriculum. An assessment of laboratory space, current usage, and equipment is required, as well as the requirements of the students for their use.
2F	Internships/ Attachments for Students	Students require both didactic classroom training and exposure to a variety of work environments to apply theoretical knowledge. These include: community therapeutic feeding sites; hospitals and similar clinical sites; office practices where advice is given to pregnant women, over-nourished individuals or those with illnesses such as diabetes or hypertension. Sites and site mentors must be identified. BUNDA faculty will need to negotiate how students will be assessed by site mentors and by the academic faculty.
2G	Accurate, Malawian Food Consumption and Composition Tables	These do not exist. Their development is laboratory-intense but this barrier can be overcome with adequate resources. Understanding the resource needs for developing these will include: (1) understanding current laboratory capacity; (2) human capacity for conducting the work; and (3) field work to conduct the consumption assessments. <i>Note: this gap is a separate item in the Tufts Scope of Work and clearly fits within the gaps for a dietetic program.</i>
2H	Accreditation and Registration	No Board of Registration or Certification exists in Malawi for Dietitians. It is possible that another clinical board of registration could provide such services in the short term, with a Board of Dietitian Registration formed in the medium term by a professional society, such as the Malawi Nutrition Society.
2I	In-Service Education	No system for continuing education exists for dietetics in Malawi. Professional esprit de corps, networking, job satisfaction, and competency maintenance is enhanced by in-service educational updates.

To accomplish this activity and develop a clear picture of gaps and possible solutions, the Nutrition CRSP will:

Conduct a strengths and gaps analysis and organizational review with the Department of Home Economics and Human Nutrition at the Bunda College of Agriculture

Assess the current nutrition curriculum at Bunda College for its alignment with national policies/priorities, and for the application of specific courses for a Dietetics program.

Develop a framework for a Dietetics program to be implemented at the Bunda College of Agriculture which, expanding beyond curriculum, includes faculty and laboratory capacity, internships, and organizational structure.

The activities at Bunda are divided into different time periods. In this Work Plan, we present the activities to be undertaken from February to September 2012:

### **Develop framework of a Dietetics program**

The field of dietetics, like nutrition overall, has evolved rapidly recently. The BUNDA dietetics program should represent best knowledge and practices from its inception. The N/CRSP through its expertise in the Dietetics program at Tufts University will lead a review of international norms for course content, skills, and competencies. It will also review the specifics of programs likely to be relevant or similar to ones that serve conditions such as those prevalent in Malawi. The N/CRSP will work with BUNDA faculty and staff to identify courses which may already exist at BUNDA that may be altered or modified for inclusion in the Dietetics program, and which may benefit from revision or updating. This work will be conducted both by core N/CRSP staff and consultants. The Tufts team with Bunda faculty will review information on existing programs and examine how existing courses fit into the needs of a Dietetics program. The Tuft team will develop the core content of the Dietetics program and will hold discussions with Bunda faculty in May 2012.

### **Undertake a needs assessment at Bunda College**

A needs assessment and gap analysis will be conducted by Bunda College and N/CRSP-Africa. BUNDA and Tufts preliminarily identified the following for a needs assessment: (1) Provide evidence for the need for dietitians within Malawi, and if possible the number needed; (2) define the specific societal needs fulfilled by training dietitians; (3) identify the human, physical, and financial resources required for an academic clinical dietetics program to meet these needs; (4) delineate the specific content of the proposed program to address scholarly and societal requirements; (5) outline practical clinical rotations (internship experiences) to complement the theoretical training, which match the circumstances students will find upon graduation; and (6) provide benchmarks for assessing the success of the program over time and its periodic review.

While an initial qualitative gap analysis was conducted during the consultations of February 6-10, 2012 (Table 1), further examination of gaps (especially to meet needs around the Dietetics program) will be necessary. Portions of the gap analysis will key off of the completion of the Needs Assessment. Key stakeholders, such as: BUNDA Faculty and Administration; Dr. Mary Shawa, Principal Secretary in the Department of HIV/AIDS and Nutrition in the Office of the President and Cabinet; the Ministry of Health; and potential employers/stakeholders such as Feed the Children, Concern and UNICEF, identified gaps which include (but are not limited to) the

following. Please note, they are not necessarily listed in terms of priority. Other key stakeholders (Ministries of Agriculture and of Gender, Irish Aid, FAO, WFP, etc. will be brought into the process. Gaps listed in Table 1 are likely to rise to the top of the more formal gap analysis. This Needs Assessment will be conducted in August 2012.

### **Course content for Dietetics program: internationally universal Dietetics competencies**

Tufts will deliver a synthesizing, overarching set of suggestions based upon the needs assessment, gap analysis, curriculum reviews, and opportunities for educational innovations. The goal of this will be to enhance nutrition education, update courses, and provide students and faculty with potential mechanisms for accessing the latest in nutrition knowledge. It will propose ways to integrate theoretical and practical knowledge so that Bunda Agricultural College graduates are recognized for both their knowledge and their ability to solve the real-world nutrition problems of the moment and for the future.

Following review of existing courses and the program and the needs assessment, it is anticipated that the Tufts and Bunda teams will work together in developing/updating the course content for the Dietetics program. Accordingly, a consultant Dietitian (regionally based) will be hired to develop course content in July, August and September 2012. The consultant will visit Malawi to work with Bunda College during this period.

### **Clinical rotations and linkages with institutions**

Discussions have also identified the need and importance linking the Bunda Dietetics program with institutions that would facilitate clinical rotation for the dietetics students. It is thus proposed that the project team (inclusive of USAID, Bunda and Tufts University) have introductory meetings with administrators, principals and/or senior management of the College of Medicine, the hospitals in Blantyre and Lilongwe as well as with the nutrition unit and EHP committee at the Ministry of Health. These introductory meetings are being set up for the end of July 2012. The Nutrition CRSP-Africa will also develop job descriptions that will allow identification of a clinical dietitian to be posted in Malawi.

### **Accreditation and certification**

A key need for the Dietetics program is the development of accreditation and board certification for the program. One avenue for exploration is accreditation and certification through the Medical Council of Malawi. The Nutrition CRSP-Africa, with Bunda College, will meet with the Medical Council and the Ministry of Health in July 2012 to explore the possibilities for linking the accreditation and board certification for the Dietetics program to the Medical Council certification process.

### **External review of program curriculum**

Once the program framework and curriculum has been developed, this will be reviewed by two external reviews. Recommendations from the review will be utilized for amending program curriculum.

## **Sub-award support to Bunda faculty and students**

The Nutrition CRSP will provide support to Bunda College and faculty during the period of February to September 2012. The support will cover the cost of the needs assessments, provide support to MSc students and support two faculty to attend international conferences.

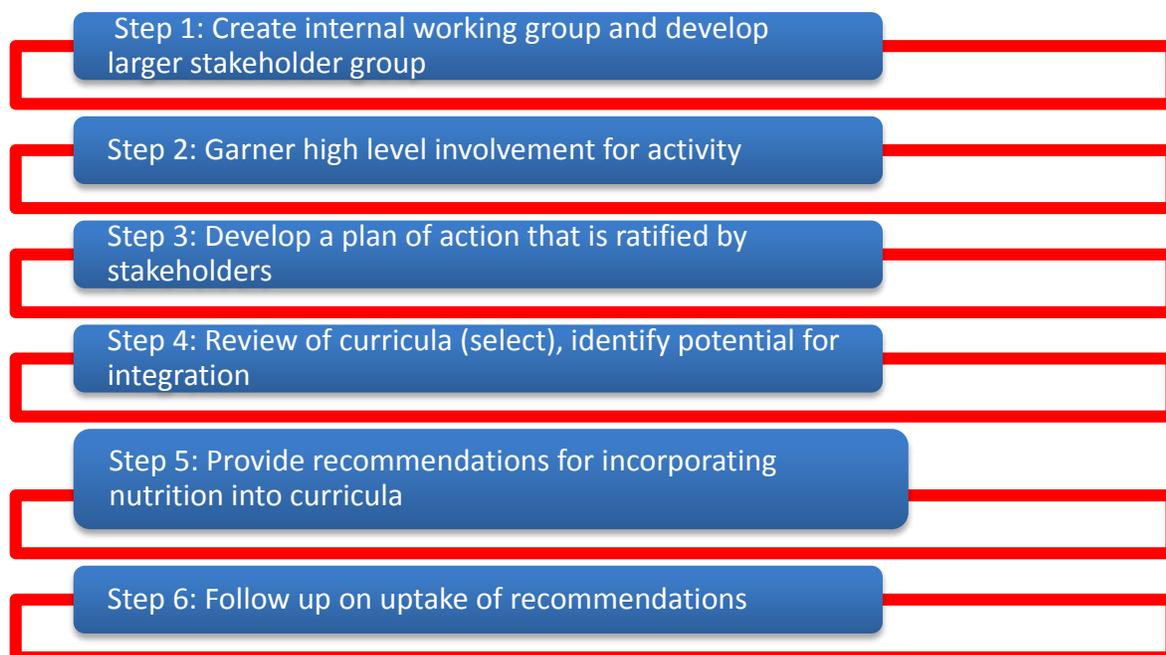
## **II. Medical School and Nursing Curricula**

An important activity of the Nutrition CRSP-Africa Work Plan in Malawi is the coordination of a review of the nutrition content of the curricula of colleges and universities providing training in nursing and clinical medicine. The N/CRSP will aim to provide a sample nutrition curriculum for specific levels (e.g. at MS level, Bachelor's level, Diploma level) and will work with various stakeholders in developing guidelines for incorporating nutrition courses in the clinical medicine and nursing college programs. Within this activity, the Nutrition CRSP-Africa will interact with Concern Worldwide and the Department of Nutrition and HIV/AIDS (Office of the President and Cabinet).

Both Concern Worldwide and N/CRSP-Africa are tasked to work on integrating nutrition into the medical, nursing, paramedical school curriculum in Malawian institutions. Concern Worldwide has a focus on integrating treatment of severe acute malnutrition (utilizing community therapeutic care practices) while N/CRSP-Africa focuses on overall incorporation of nutrition into the medical school curriculum. There is an agreement that while both institutions could work on reviewing all (or most of the curricula) and provide recommendations for incorporating nutrition in the learning agenda, the likelihood of change would be minimal unless the activities were started with buy-in, support and input from key stakeholders including the Department of Nutrition and HIV/AIDS, the Ministry of Health (Nutrition Unit and Senior management), Medical Council of Malawi, Nursing Council of Malawi, the principals of the key colleges in the country (College of Health Sciences, College of Medicine, College of Nursing, Bunda College and Chancellor College). It was thus agreed that the process of review and recommendations for integrating nutrition into the curricula should start with the development of consensus at the highest level. To that end, both Concern Worldwide and N/CRSP-Africa have agreed to the process as defined in Figure 1.

To roll out this process, an internal meeting is proposed, the week of June 25, 2012. Invitees will include USAID Uganda, Ministry of Health, Dept of Nutrition and HIV, and Concern Worldwide. This will constitute the internal working group. In addition, the team will constitute a stakeholder's group that will include representatives from USAID Uganda, Department of Nutrition and HIV, Ministry of Health, Ministry of Education, Medical Council of Malawi, Nursing Council of Malawi, World Health Organization, UNICEF, Concern Worldwide and N/CRSP-Africa. A stakeholder workshop will be organized in July (the week of July 16). The aim of the meeting would be to introduce to the stakeholders the importance of integrating nutrition education with medical education within the context of undernutrition (as relevant to treatment of SAM and the 1,000 days strategy), but also to nutrition associated with non-communicable diseases. N/CRSP-Africa is developing a detailed timeline for the finalization of this activity and will provide this information to Concern Worldwide on finalization its Work Plan.

Figure 1: Process for developing recommendations for incorporating nutrition into medical school curricula



Following the development of action plan, the partners will work on the following activities involving the internal and external stakeholder group as necessary:

- Define criteria for Curricula for Review (clinical medicine and nursing at degree and diploma level) examining the four sample curricula that Concern Worldwide has reviewed;
- Review curricula for nutrition content;
- Develop recommendations on incorporating nutrition materials (nationally prioritized aspects and those by MOH nutrition) into the curricula; and
- Develop a roadmap for pre-service training in health with a nutrition focus.

### Selecting Curricula for Review

Concern Worldwide has already reviewed four curricula (medical school—level to be determined) for incorporation of CMAM components. The joint group will be tasked to start examining these sample curricula.

Furthermore, the Nutrition Unit at the Ministry of Health indicated that there are many private and public institutions that offer degree and diploma-level programs in clinical medicine and nursing, and are candidates for review. We anticipate requesting Concern Worldwide to link up with the N/CRSP team to identify the curricula, having discussed this with them during the site visit February 4-10, 2012. A focus will be on incorporating CMAM modules. The N/CRSP team has discussed this with Dr. Mary Shawa, who indicated that curricula could be requested from the

institutions through the DNHA, OPC. Given the large number of institutions, a subset of representative ones may be chosen for review, with recommendations made for like institutions within a given type. A recommendation by the Nutrition Unit is to consider the following institutions:

- Christian Health Association (which encompasses the technical colleges that offer such degrees)
- University of Malawi (Nursing campus in Lilongwe and Blantyre, Medicine campus in Blantyre, Clinical Medicine)
- College of Health Sciences (to become part of the University of Malawi)
- Mzuzu University (Faculty of Medicine)
- National Research College (has nutrition related degrees)

### **Review curricula for nutrition content**

Following the selection of a representative subset of the curricula, the team will conduct a detailed curricular review. This may require the instructors at the institutions to provide a detailed summary of the nutrition course components. The team will likely utilize a consultant for this review (as well as likely working with Concern Worldwide to aggregate the curricula). The nutrition content of the curricula will be compared to the current priorities/plans of the Nutrition Unit of MOH and DNHA, OPC.

### **Develop recommendations for incorporating nutrition content**

The curriculum review will allow the Tufts N/CRSP team to develop recommendations around the *type* of nutrition content (e.g. CMAM, Food by Prescription protocols, growth standards, etc.) and *amount* of exposure to nutrition content. These recommendations will be presented at a stakeholder workshop (inclusive of DNHA, OPC, MOH/Nutrition, USAID/Malawi, Concern Worldwide, in addition to select clinical and nursing academic institutions).

### **Develop roadmap for pre-service training sensitive to nutrition**

Following the presentation of the recommendations, the team will work with the stakeholders in the development of a roadmap for pre-service training that is sensitive to nutrition. Via this consultation, we anticipate to receive feedback that will allow the team to develop a sample curriculum.

### **Challenges and considerations of follow-up**

A key issue is the translation of this sample curriculum into action. While the team can provide a sample curriculum and give recommendations for incorporating content, this will not ensure implementation of the recommendations. Stakeholder discussions indicate that there may be a need for a higher-level push on institutions to incorporate nutrition curricular content. One suggestion is to involve (via the Department of Nutrition and HIV/AIDS, OPC) the Medical Council and other accrediting bodies into the process. They may mandate specific nutrition courses or

content for the certification (clinical registration) of individual health care workers. This would effectively ensure that all institutions offer this nutrition content into their curricula.

**A challenge is the wide variety of colleges and technical institutions that provide these degrees.**

This likely means that there are a diverse set of curricula used in Malawi for these disciplines. Since no central authority recommends or approves curriculum, bringing all these curricula together will be both a challenge –and an opportunity for challenging current paradigms. By choosing a representative subset, we anticipate overcoming this challenge.

### **III. Food Composition Tables**

The Nutrition CRSP team will also work with USAID/Malawi to develop an activity for the production of Malawian food composition tables, including a budget/costing plan. There is currently very little information on the differences in diets and dietary patterns across Malawi. There are reports of increased incidence of non-communicable diseases related to nutrition, however there is very little supporting information on the dietary practices that influence NCD incidence. As Tufts has noted, this activity requires considerable time and the devotion of resources. It was agreed that Tufts would prepare a proposal outlining the steps required for the compilation of high quality food composition tables along with a detailed budget of costs and timeline for activities. Tufts believes that if this is well planned, and developed with a concrete timeline, this activity should be possible to implement within one fiscal year.

The activity would include understanding the capacity of Bunda College, including faculty capacity and knowledge around food composition analysis, laboratory space and capacity in conducting the food and nutrient analyses. The analyses will require a preliminary list of laboratory equipment and staff capacity. Select faculty from Bunda College may benefit from attending training courses such as those offered by INFOODS (Food and Agriculture Organization Network on Food composition analyses). The proposal will also outline the steps to be undertaken in the project, including but not limited to, the development of food lists (individual and composite foods), collection samples (or cooking samples), development of methods for analyses (nutrient analyses), data base development, recording and management, and publication of the tables (electronic and hard copy). It could also possibly include linking Bunda College to those in charge of the INFOODS network based at the Food and Agriculture Organization. These linkages would also allow the faculty to maintain professional networks, and also keep up with new knowledge around food composition analyses.

**Deliverables and Timeline:** The deliverables and timeline for the activities from February through September 2012 are provided in the Gantt chart below:

Year	Activity	Period 1: 2012				
		May	Jun	Jul	Aug	Sept
<b>DIETETICS PROGRAM</b>						
	Develop framework of a Dietetics program	X				
	1. Review of existing programs	X				
	2. Review of Bunda recommended and existing courses	X				
	3. Develop a skeleton framework for Dietetics program	X				
	Develop course content of 10 courses for Dietetics program					
	1. Develop job description for consultant	X				
	2. Hire consultant		X			
	3. Consultant visit to Malawi to work with Bunda College			X	X	X
	Develop collaborations with Ministry of Health, College of Medicine and Hospital Administrators for internship rotation					
	1. Meet with Ministry of Health (USAID, Bunda, Tufts team)			X		
	2. Meet with College of Medicine (Travel to Blantyre -USAID, Bunda and Tufts team)			X		
	3. Meet with Hospital Administrators (in Blantyre and Lilongwe- USAID, Bunda and Tufts)			X		
	Develop relationship with Ministry of Health, Medical Council with reference to accreditation and board certification for Dietitians					
	1. Meet with Medical Council (USAID, Bunda and Tufts)			X		
	2. Meet with Ministry of Health (Bunda, Tufts and USAID)			X		
	Identify faculty support/mentors for placement in Blantyre Hospital to oversee internship rotation			X		
	Review of program curriculum and structure by external reviewers					
	1. Identify two external reviewers (Tufts/USA or African dietitians)					X
	2. Review of program curriculum and provision of recommendations					X
	3. Amendment of program based on committee recommendations					
	Review of program curriculum and structure in a joint meeting					
	Identify senior dietitian faculty for placement in Lilongwe Hospital to oversee internship rotation					X
	Development of structure of licensing and accreditation (with Malawi Medical council)					
	Finalization and launch of Dietetics Program (will include finalization of course content, meetings)					
<b>MEDICAL SCHOOL CURRICULUM</b>						
	Initial Discussions with USAID, MOH and Concern Worldwide	X				
	Internal Meeting Discussions (OPC, Ministry of Health, Concern Worldwide)		X	X		
	Stakeholder meeting (OPC, Ministry of Health, Concern Worldwide)			X		
	Stakeholder workshop (all internal members plus Medical Council of Malawi, College of Medicine)			X		
	Review of medical school curricula (4- 8 syllabi)					X
	Stakeholder meeting (to finalize recommendations of the review)					
<b>FOOD COMPOSITION TABLE DEVELOPMENT</b>						
	Stakeholder meeting (OPC, Ministry of Agriculture, Ministry of Health, Bunda College)			X		
	Meetings with INFOODS Coordinator (all stakeholders)					
	Study on existing food tables, development of food lists			X	X	X
	Review of dietary patterns across Malawi			X	X	X

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## Appendix 4: Research Concept Note – Malawi

### 1. Purpose of this document

This document is written to provide information on why a nutrition-oriented study using birth cohorts designed to study the implementation of the SSDI and INVC programs is of interest to programs which influence nutrition. The study would utilize birth cohorts in districts with SSDI, with INVC, with both SSDI and INVC, and with neither (a control district). We believe that such a study is of interest to multiple groups within USAID/Malawi whose focus is not *primarily* nutrition because their programs *have substantial impacts* on nutrition.

To study the delivery and impact of SSDI and INVC, the Nutrition CRSP would collect information on relevant influences on the mothers and their children. This would include USAID supported programs which do not directly target nutrition yet have important consequences/influences on the nutritional status of a pregnant woman, nursing mother or infant. This document: (1) delineates why such a rigorous research study may be of interest to USAID/Malawi programs above and beyond nutrition; and (2) outline the basics of birth cohort studies.

### 2. What is the Nutrition Collaborative Research Support Program (Nutrition CRSP)?

The USAID-funded Nutrition CRSP aims to understand not only *what* interventions work, but also *why* and *how* interventions succeed (or fail) when implemented at large (national) scale. In contrast to other USAID-funded CRSPs, the Nutrition CRSP conducts large-scale research at the national level. Unlike other CRSPs (Peanut CRSP, AquaFish CRSP etc), the Nutrition CRSP has an operational focus, above and beyond the “what might work” discovery-science approach. Country ownership and priorities are paramount to the Nutrition CRSP. Alignment between the Nutrition CRSP and governments, USAID missions, and key stakeholders is critical to the ability of the Nutrition CRSP to assess large-scale implementation. Our core focus is on the ways in which **nutrition, health, and agriculture** can improve nutrition and health, especially of pregnant women and young children. Tufts University already holds a Leader Award for studying packages of health, nutrition, and agricultural interventions in Uganda and in Nepal.

In order to understand the success or failure of a program, the Nutrition CRSP collects information about household and individual access to maternal and child health services access, malaria, water and sanitation (WASH) programs, reproductive health care access and use, and similar influences. This information is necessary for us to conduct a rigorous assessment of the impact of the package of interventions in the context of these other influences. It also provides a powerful opportunity to how these related programs have influenced the studied populations, and how they influence the success of additional specific nutrition interventions. This approach serves the USAID learning agenda for understanding how best to allocate its resources in Malawi.

### 3. Why use birth cohorts to understand USAID program effectiveness and implementation?

High priority USAID programs target pregnant women, infants, and young children. Birth cohorts study these exact groups. They are the prime focus for: interventions of maternal and child health; nutrition; HIV perinatal transmission; water and sanitation (WASH); reproductive health;

and malaria prevention. The health effects of each of these programs will, logically, affect the health and nutritional status of women and children who live in the areas where the SSDI and INVC programs will operate. For these programs, the connections with nutrition are well understood.

The use of birth cohorts also has great power to address knowledge gaps. For example, the *actual* benefits for pregnant women and children from many agricultural interventions are, surprisingly, not as well understood as they are for programs such as maternal and child health programs (MCH) or WASH. Agriculture is the core asset of the Malawian economy. Agricultural programs to increase crop yield, improve crop varieties, increase income, and develop value chains are believed to lead to nutritional improvements, but the evidence for this is more scanty than for many other programs. The need to develop solid evidence regarding the nutritional benefits for women and young children is great. A birth cohort study could provide substantial insights into the success of USAID funded agriculture programs. This would be of importance to Malawi, and potentially of importance to the global USAID evidence base.

In summary, birth cohort studies focus on key populations (pregnant women and young children) for USAID, and provide a mechanism for strengthening the evidence base for programs which are known, or believed, to improve their nutrition.

#### **4. Nutrition-related programs which could be evaluated for *true* impact via birth cohort studies would include those targeting (but not limited to):**

- The **reproductive health of pregnant women and birth spacing** as it profoundly affects the birth outcomes, health and nutritional status of infants and children;
- Interventions to **decrease HIV transmission** from mother to child which focus on this exact group;
- **WASH (water, sanitation and hygiene) interventions** which decrease diarrheal diseases *and* respiratory disease (pneumonia) and skin infections. **Diarrhea and pneumonia** are leading causes of death in children under 5 years of age, and sap the nutritional status of surviving children. Skin infections due to poor hygiene are a cause of perinatal death;
- **Malaria** is a major cause of **anemia, and infant and child death**. It is also the **cause of many adverse pregnancy outcomes (premature birth, still births, intrauterine birth retardation, and low birth weight)**. It is for this reason that **iron/folate supplementation, bednets, and anti-malarial intermittent preventive treatment (IPT)**, are advised for pregnant women and children;
- **Maternal nutritional status, exclusive breast feeding up to 6 months of age** with continued breastfeeding and adequate **complementary feeding** during period of 6 to 24 months are classic MCH measures aimed at improving **child health and nutrition**;
- **Agricultural inputs** relating to **agricultural productivity, improving household dietary diversity, crop yield, variety, improved value chains and income**, and **proper processing and storage** are believed to be capable of substantially altering maternal and child health as well although the evidence for this is more scanty than for the above.

We emphasize that by accounting for these programs in a multi-district study, the actual “real world” benefits of such programs could be assessed for a key USAID target group. The Nutrition CRSP exists to study the true impact of programs when implemented at scale rather than under ideal conditions.

#### **5. Why use birth cohort to augment basic monitoring and evaluation, and how do they work?**

Women of childbearing age, pregnant women, and young children are high priority population target groups for multiple USAID supported programs. Standard monitoring and evaluation usually describes their characteristics (percent underweight, anemia, stunting, etc.) or the number of people reached, but does not provide data or evidence as to why and how programs are successful in actually changing the health and welfare of the population. Studies such as birth cohorts allow one to assess the ***degree to which true benefit has occurred***. The Nutrition CRSP approach evaluates the influence of other programs, so that the true benefit of not only the nutrition interventions but also the influencing programs can be assessed.

**The prospective nature of a birth cohort provides far more powerful, robust strength to any conclusion that a program *caused* a health benefit than can any cross-sectional study.** A major weakness of cross-sectional studies, which are commonly used for standard monitoring and evaluation, is that they provide only suggestive but not *causal* evidence. Cross-sectional studies are often done before an intervention and then afterwards in standard M&E. Any positive change is at best “possibly” related to the intervention. USAID is committed to an evidence-based process for resource allocation. Prospective studies allow one to say a programmatic input *caused* a benefit rather than “might have been associated with” a benefit.

Birth cohorts are conceptually straightforward. Women of childbearing age are identified. When pregnant, these women are enrolled into the study. Their household economic characteristics, health, access to health facilities, nutritional status, gender-related farming and economic activities, hygienic practices, and other baseline information is collected. The courses of their pregnancies, birth outcomes, and the health of the infants, are followed. The baseline information is also re-evaluated periodically to understand how these characteristics may have changed over time. The nutrition and health status of the mothers and children is assessed over time as the children grow, to evaluate the impact of the interventions, accounting for other influences (such as malaria, WASH, reproductive health access, etc).

Birth cohorts will be set up in the different districts where SSDI and/or INVC are deployed. Inevitably, pre-existing baseline circumstances will differ somewhat between the districts. In order to compare the cohorts from the different districts against one another, standard statistical methods will be used to ‘handicap’ for these factors. **This handicapping process will allow an assessment of the effects of the pre-existing programs which are not *primarily* nutrition oriented yet influence the nutrition and health of the mother-child pairs.** A control (“counterfactual”) cohort in an area not served by SSDI or INVC is a critical comparison group. Without a control group, one cannot say any benefits from SSDI or INVC would not have occurred otherwise. (For ethical reasons control cohorts usually receive some benefits as well, such as reinforced basic health care or enhanced vaccination coverage). Through statistical analyses, the main programs (SSDI, INVC) will be compared and assessed over time. In order to account for the

effects of other programs (MCH, malaria, agriculture, etc), data on them will also have to be acquired and updated over time. In addition, data on program processes and impact pathways (SSDI and INVC) will allow understanding the results of the outcome analyses. By acquiring both *outcome* data and *process* information, and accounting for other programs, the true success of SSDI and INVC can be judged. In addition, the true influence of other important programs, as outlined above, can be evaluated. The use of a prospective method; a control group; and repeated measures provides scientific rigor.

## 6. Why do birth cohorts make sense for assessing programs and interventions in Malawi?

- Malawi has globally high rates of childhood stunting and undernutrition, and stunting appears early in childhood during infancy through ~ 24 months of age. (See Figure 1). Birth cohorts address Government of Malawi, USAID, and other international actor priorities as they have identified women of childbearing age, pregnant women, and young children as high priority target groups for their resources;
- The most effective practices and implementation processes *within the Malawian context* can be identified, or identified for revision; and
- Prospective birth cohorts are a ‘gold standard’ study approach which also allows comparisons across national boundaries as well as within a country. This serves the USAID goal of developing a global, evidence-based approach for allocating its resources.

Figure 1. The window of opportunity to address nutrition is during pregnancy and the first 24 months of age (the first 1,000 days of life). Graph displays Global Stunting. Note that sub-Saharan Africa and South Asia/Cambodia are the regions with the worst stunting.

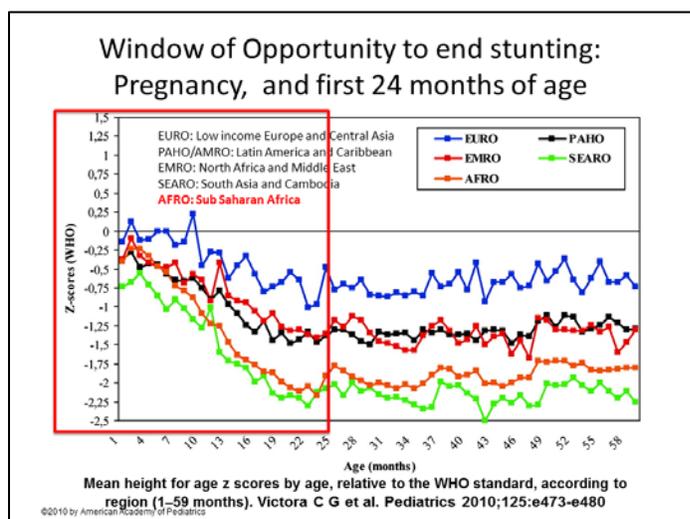


Figure 2. Schematic showing possible differences in one marker of nutritional status, height for age, between a program which decreases stunting and a program which does not.

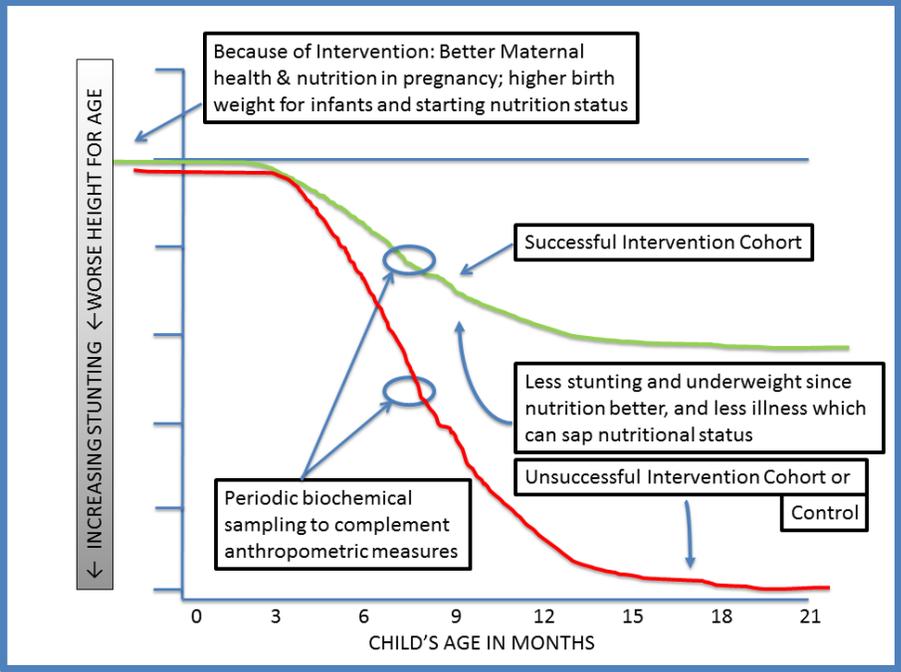
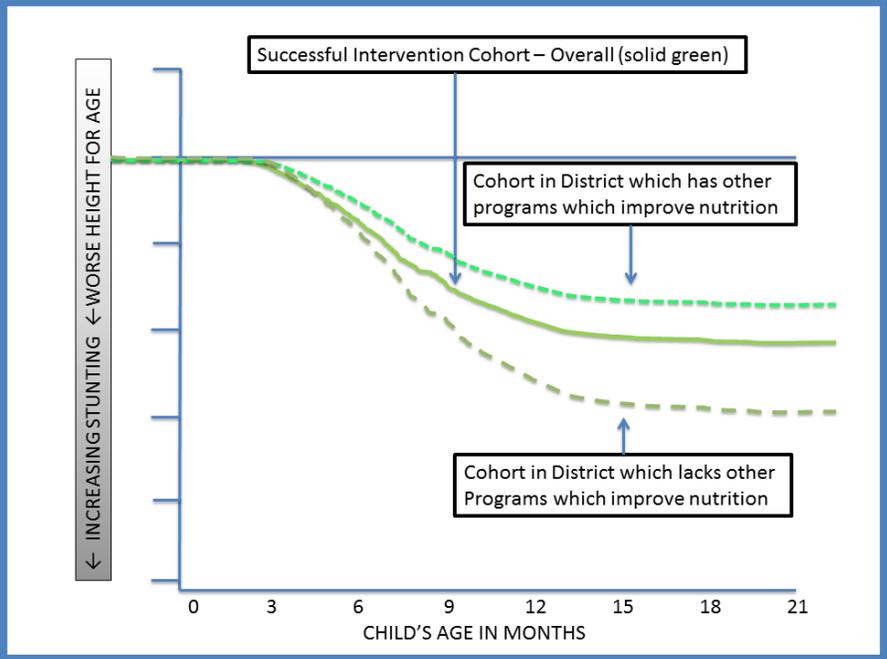


Figure 3. Diagram showing possible differences in outcomes in a successful nutritional intervention district—with and without *other* successful programs. The solid green line is the same overall result seen in Figure 2. The top dashed line represents the *incremental benefit* of other programs operating in the district which are truly successful in decreasing stunting. The bottom dashed line represents the benefits seen in a district which *lacks any other beneficial programs*. Within a single district, one can separate out the sub-groups within the district whom have beneficial programs by geographic location or other criteria.

A birth cohort can measure overall success due to a program, and also separate out the benefits (or lack of benefits) seen due to other programs operating in the district. This figure shows height for age. Other health or nutrition parameters are, of course, measured and can be compared.



## Appendix 5: Activities and Outputs, N/CRSP-Africa Year 2 (FY2012) – REVISED JULY 2012

Theme (a): Scientific Research				
Outcomes	Indicator Number	Output Indicators	FY 2012 Targets	FY 2012 Actuals
<b>Outcome 1: Improved host country nutrition and food security monitoring, analytics and surveillance capacities</b>	N/CRSP	1. Number of US and host country institutions that have gained enhanced capacity in nutrition research, monitoring and surveillance methodologies, nutrition information systems, and/or nutrition interventions with USG assistance	7	23 (+1 in Malawi)
	N/CRSP	2. Number of food consumption and/or nutrition surveys undertaken, or reported on and disseminated	4	11
	N/CRSP	3. Number of U.S. or host country institutions or individuals having completed a nutrition assessment, survey or gap analysis	9	11
Theme (b): Human and Institutional Capacity Development				
Outcomes	Indicator Number	Output Indicators	FY 2012 Targets	FY 2012 Actuals
<b>Outcome 2: Improved host country academic, technical and research capacity in nutrition, health and agriculture</b>	N/CRSP	4. Number of people trained in child health and nutrition (nutrition science, dietetics and public health nutrition) through USG supported programs (longer term)	2	9
	N/CRSP	5. Number of people trained in child health and nutrition (nutrition science, dietetics and public health nutrition) through USG supported programs (short term)	100	150
	N/CRSP	6. Number of US and host country institutions with enhanced capacity to assess, plan, design, implement, monitor and/or evaluate nutrition programs, policies and practices	7	9
	N/CRSP	7. Number of US and host country institutions and individuals who have gained enhanced capacity in clinical, operational, agricultural, translational and/or public health nutrition research aimed at the reduction of malnutrition with USG assistance	100	168
	N/CRSP	8. Number of peer-reviewed journal articles co-authored with host country institutions and others in country with USG assistance (submitted or published)	2	0
	N/CRSP	9. Number of brief articles and presentations co-authored with host country institutions and others in country with USG assistance	5	15

### Deviation Narratives

1. N/CRSP indicator No.8 Peer-reviewed journal articles co-authored with host country institutions and others in country with USG assistance. (1) Ugandan co-author not available due to medical leave and being named High Commissioner to the UK (re-analysis GINA II data). (2) Data for second paper forthcoming, not available during FY 2012 (initial findings of panel survey data, which is now being collected)

## **Appendix 6: List of Appended Partner Reports**

- a. Purdue
- b. Harvard
- c. Tuskegee
- d. DAI

## **Appendix 7: List of Research Briefings**

- a. Biomass fuels - Purdue University
- b. Aflatoxin research brief - Purdue University
- c. Complementary feeding - DAI
- d. Research methods workshop - Tufts University
- e. Protocol for baseline survey - Harvard/Makerere/Tufts Universities
- f. Aflatoxin cohort study protocol - Tufts University
- g. Mapping of interventions - Tufts University