BILL & MELINDA GATES foundation

Final Narrative

Use this form to provide your final update to your foundation program officer regarding the results achieved for the entire project. In addition, please provide your perspective on key lessons learned or takeaways and input on the foundation's support of your work to ensure that we can capture and share learnings as appropriate both internally and externally.

The Final Narrative must be submitted in Word, as PDFs will not be accepted.

General Information

Investment Title	Jumpstarting Orange-fleshed Sweetpotato in West Africa through Diversified Markets		
Grantee/Vendor	International Potato Center		
Primary Contact	Edward Carey	**Investment Start Date**	April 4, 2014
Feedback Contact[1]	Edward Carey	**Investment End Date**	May 31, 2017
Feedback Email[1]	e.carey@cgiar.org	**Reporting Period Start Date**	April 4, 2014
Program Officer	Lauren Good	**Reporting Period End Date**	May 31, 2017
Program Coordinator	Jeanne Bridgman	**Reporting Due Date**	June 30, 2017
Investment Total	$4,000,000.00	**Opportunity/Contract ID**	OPP1081538
Remaining Funds (If applicable)	$61,744		

[1] Feedback Contact/Email: the full name and email of the contact whom foundation staff queries for various surveys.

Submission Information

By submitting this report, I declare that I am authorized to certify, on behalf of the grantee or vendor identified on page 1, that I have examined the following statements and related attachments, and that to the best of my knowledge, they are true, correct and complete. I hereby also confirm that the grantee or vendor identified on page 1 has complied with all of the terms and conditions of the Grant Agreement or Contract for Services, as applicable, including but not limited to the clauses contained therein regarding Use of Funds, Anti-Terrorism, Subgrants and Subcontracts, and Regulated Activities.

Date Submitted	[July 7, 2017]	**Submitted by Contact Name**	Edward Carey
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Progress and Results

1. Final Progress Details

Provide information regarding the entire investment's progress towards achieving the investment outputs and outcomes. In addition, submit the Results Tracker with actual results as requested.

Introduction

A comprehensive overview of the progress made by the Jumpstarting Orange-fleshed Sweetpotato in West Africa through Diversified Markets project (hereafter, referred to as the Jumpstarting project) was presented in the midterm report submitted in October 2016. In this final report, we reflect on the learning questions developed during our Theory of Change (ToC) workshops and use these to structure our analysis of the project's outcomes over the 3 years of implementation. The report and its annexes present significant lessons learned and "take-home" messages. We also provide complementary data and information from the last 6 months that were not yet captured in the midterm report. Results include the surveys conducted during the last reporting period drawn from (1) endline survey report for Ghana and Nigeria (Annex 10); (2) cost–benefit analyses of OFSP market interventions in Ghana, Nigeria, and Burkina Faso (Annex 9a); (3) evaluations of willingness-to-pay for vines and roots by pregnant and lactating women who received nutrition counseling through the Ghana Health Services (GHS) (initial key findings presented below); and (4) media reports regarding the Jumpstarting project (Annexes 5a, 9b, and 11n, 11o).

As discussed in the midterm report, most of the project milestones have been achieved, some were exceeded, and a few still needed to be finalized during the last 6 months. These have now been completed (see Annexes 1–3). The remaining activities in the last 6 months were the following: (1) endline survey—for the overall project and the GHS willingness-to-pay study; (2) questionnaire for those who participated in the demonstration of the Triple S method (storage in sand and sprouting)—one of the demo trials related to use of improved methods for sweetpotato seed systems (Annex 4g); (3) visits by journalists to help publicize results from the OFSP value chain interventions and their benefits to sweetpotato farmers and others in Ghana and Nigeria (Annexes 5a and 9b); (4) a further advocacy visit in January 2017 by His Excellency Dr. Kofi Annan and his wife, Mrs. Nane Annan, to Ghana, highlighting OFSP developments for business in Cape Coast and Accra; (5) presentation of the Jumpstarting project findings at the International Society for Tropical Root Crops Africa Branch (ISTRC-AB) in Dar-es-Salam, Tanzania (Annexes 8a, 8b); and (6) dissemination workshop for Jumpstarting in Accra, Ghana, where results of the project were explained to the Government of Ghana through the Ghana Agricultural Sector for Investment Program, which has committed to further scaling of OFSP value chains using public-private partnership (PPP) models (Annexes 11a–11o).

Project vision, outcomes, and associated learning questions

The vision of the Jumpstarting project was to demonstrate several sustainable and inclusive market-driven approaches for OFSP that lead to increased incomes and improved health through consumption of vitamin A-rich OFSP, especially for women and children in Ghana, Nigeria, and Burkina Faso. The work centered on the following four outcomes and associated learning questions developed during the ToC workshops:

- Outcome 1. Formal and informal diversified OFSP market opportunities developed in pilot areas in Ghana, Nigeria, and Burkina Faso. Learning questions: (1) What are the specific market models of Jumpstarting? (2) What is the cost of the pilot for each model? (3) Which of these models would be most likely be successful if implemented at scale?
- Outcome 2. Viable Quality Declared Planting Material seed systems in target areas capable of expansion in response to increased demand. Learning questions: (1) What are the critical factors in producers' decisions to adopt or not adopt OFSP under different agro-ecological settings and different market conditions? (2) What can be done to decrease non-adoption?
- Outcome 3. Households, including women and children, in target areas have increased consumption of vitamin A from OFSP. Learning questions: (1) How has Jumpstarting improved the nutritional knowledge among producers, traders, and consumers of OFSP, segregated by gender? (2) Does improved knowledge lead to increased consumption of OFSP?
- Outcome 4. Commercial sweetpotato planting material and OFSP producers, including women, increase income through participation in OFSP value chains. Learning questions: (1) What is the impact of the Jumpstarting work outside their direct beneficiaries (e.g., neighbors or nearby communities)? (2) Which of the market models helped to increase incomes for OFSP producers?

Project Achievement

Outcome 1. Formal and informal diversified OFSP market opportunities developed in pilot areas in Ghana, Nigeria, and Burkina Faso.

Q1: What are the specific market models of Jumpstarting OFSP?

Background. In the project locations, farmers often plant sweetpotato for home consumption after they have planted other important crops such as groundnut and maize during the planting season, particularly in areas where sweetpotato is not yet commercially important. Reasons for this practice include the higher priority given to other crops, the comparative flexibility of sweetpotato planting, and the effort it takes to gather planting material, often incrementally, from previous season's sweetpotato field, neighbors, friends, or family. One of the outcomes of this practice is that sweetpotato yields are sub-optimal, especially in areas where rainfall is unreliable, the rainy season is short, and locally sourced sweetpotato planting material is of variable or generally poor quality. In other words, where sweetpotato is cultivated as a secondary or tertiary crop in this way, productivity is arrested at a low level; although farmers may still value the returns they get from limited and flexible inputs and thus continue to cultivate sweetpotato in these areas.

Market models. To raise the importance of OFSP from an "orphan" crop to a priority crop in West Africa, the Jumpstarting project was launched in Burkina Faso, Nigeria, and Ghana in April 2014. The aim of this 3-year pilot project was to evaluate the possibility of establishing value chains for nutritious OFSP, starting with the establishment of commercial planting-material growers targeting root producers who in turn targeted specific market opportunities for OFSP roots, including structured and informal markets. Two basic assumptions were that increased awareness of the nutritional value of OFSP will generate increased market demand for OFSP roots and hence for good quality planting material of preferred varieties, and that this demand chain can be strengthened and accelerated through improved supply chains of quality OFSP planting material. Based on these assumptions, the project developed specific ToC's to determine market models that can 'jumpstart' OFSP value chains in different socio-economic and agro-ecological environments in the three participating countries. At the outset of the project, target markets in each country were determined through actor-centered ToC exercises. In **Burkina Faso**, OFSP was not yet found in the markets, though there were well-established commercial markets for the white-fleshed varieties. With iDE-Burkina Faso, a nongovernmental organization (NGO), and INERA, the national agricultural research system (NARS) partner, we targeted the informal (non-contractual) production and marketing system in Kénédougou Province (Southwestern Burkina Faso) for the OFSP intervention. INERA worked to establish the commercial seed system, and iDE focused on producer group organization and market linkages. In **Nigeria**, the O-Meals school-feeding program presented a more structured (but still non-contractual) market in Osun State. In Kwara State, efforts focused on stimulating demand in informal (local) markets. The National Root Crops Research Institute (NRCRI), the NARS in Nigeria, worked with state extension staff to develop commercial seed system and OFSP

storage roots production in both states. In **Ghana**, the focus of production activities was in pilot areas of the Northern and Upper East Regions (UERs), where a mix of structured and informal market approaches was used, including (1) informal rural and urban markets; (2) a brief pilot with the structured market presented by the Ghana School Feeding Program (GSFP) in Northern Region; (3) nutrition counseling of pregnant and lactating women by the GHS, a market stimulated through donations of vines and roots; (4) introduction of OFSP puree as a substitute for wheat flour in bread; and (5) markets served by an aggregator in Accra who supplied supermarkets (Shoprite), embassies, and a few bakeries.

In each country, market development work went hand-in-hand with establishing or strengthening seed system and production capacity. Figure 1 (left) presents a generalized schematic of the commercial seed system, with linkages to breeding at one end and producers serving markets at the other end. Figure 1 (right) presents the crop calendar which guides considerations with respect to seed systems and market supply. We anticipate that with increasing demand by institutional and processed product markets, year-round production under irrigation will become increasingly common. Figure 2 presents images from Jumpstarting work in Ghana's Northern region, showing planting material sales, seasonal markets, and emerging off-season production.

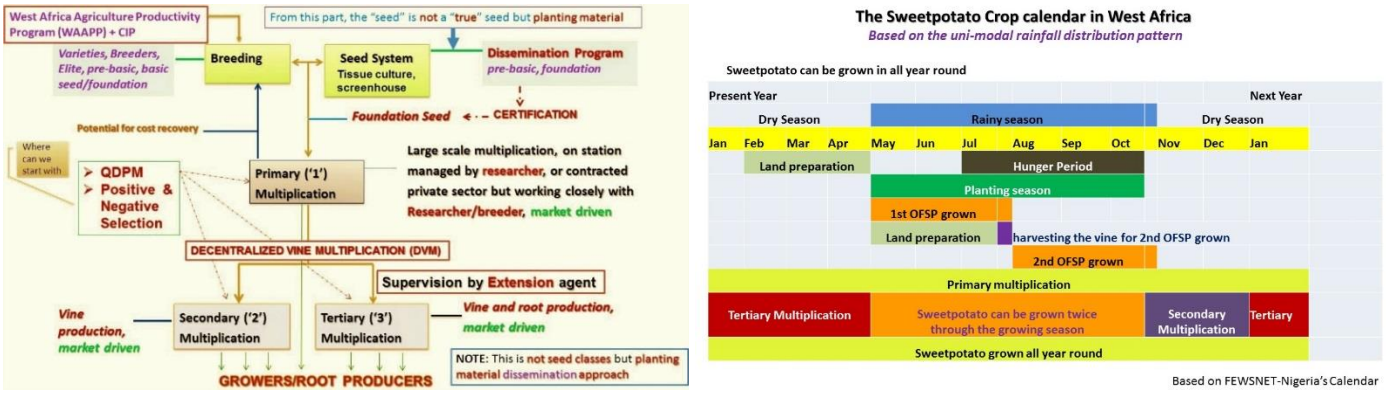

Figure 1. Market-driven seed systems linking to breeding program and fitting to sweetpotato calendar.

Figure 2. Images of emerging commercial OFSP fresh markets in northern Ghana, seed supply, and emerging dry season production.

Market model in Ghana:

- The main OFSP-processed product for this intervention was OFSP golden bread, made with roughly 50% substitution of wheat flour with OFSP puree, and with another potentially promising product, OFSP *gari*, still under development. Preliminary analyses showed the OFSP–cassava *gari* product to be nutritionally promising (Annex 4a). The product was well-received in limited market testing. The OFSP bread results, initially reported in the October 2016 midterm report, made excellent progress with additional bakers offering this product, particularly around Great Accra.
- During the reporting period, the University for Development Studies (UDS) in Tamale successfully conducted a new product enterprise competition for students and recent graduates (see Annex 4b). Twenty-two product enterprise ideas were proposed, with the top 3 producing business plans to produce bread, gari, and sausage with OFSP included in the recipe.
- Acceptance of OFSP in a pilot effort to include it on the weekly menu of two schools participating in the GSFP in Kumbungu District was high by students and caterers. But the program did not continue beyond a 2-month pilot period because the caterers were unable to pay producers immediately for their roots. School children and caterers accepted and enjoyed having OFSP in their meals (see October 2016 midterm report). Furthermore, producers in the Kumbungu area continued to cultivate sweetpotato for other markets and home consumption, and will be pleased to continue selling to the GSFP if and when payment issues can be sorted out.
- Regarding the GHS counseling program, while improving their nutrition status we were interested in whether this vulnerable group would come back to buy OFSP vines and roots after getting a voucher for a free bundle of vine cuttings (100 cuttings/bundle) and free OFSP storage roots (2 kg/beneficiary) during their routine counseling visits. The voucher scheme was applied to get accurate data on vine cuttings and storage roots given to beneficiaries. The study on the willingness to pay by GHS beneficiaries was conducted during the planting season in July 2016, for vine cuttings and during the harvest season, October–December, for OFSP storage roots. To understand whether this vulnerable group came back to buy vine cuttings and storage roots, a simple endline survey was conducted, final results of which are still being analyzed.

Initial results from the willingness-to-pay study showed that some of the GHS beneficiaries did buy OFSP vines and roots. This was actually a relatively high proportion of purchases given that GHS provides free package of food to pregnant women and lactating mothers who came for their routine counseling visit to the community health center. Despite this, 15.5–16% of this group being studied returned to buy the OFSP vines and storage roots after receiving them for free through the voucher scheme (N_samples for Northern Region = 137 and for UER = 282; see Fig. 3). We concluded that through the counseling facilitation at the community health center, a market for vines and roots could be created, though it may depend on the type of intervention. More investigation is needed. A full report from the endline survey regarding the GHS intervention will be published separately. Annex 11i summarizes information presented by the GHS during the Jumpstarting project dissemination workshop held on 10 May 2017, and Annexes 1 and 2 provide additional details.

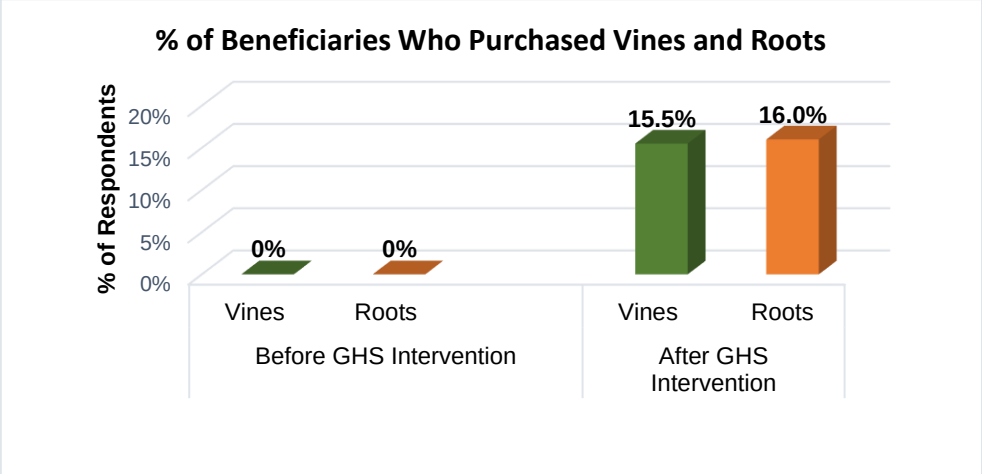

Figure 3. GHS beneficiaries bought vines and roots from the willingness-to-pay study organized by CIP and GHS.

Detailed achievements in Northern Region are reported by the Association of Church-Based Development Projects (ACDEP) (Annex 4c) and UER by iDE-Ghana (Annex 4d), seed technology innovation platform by the Council for Scientific and Industrial Research–Crops Research Institute (CSIR–CRI) (final project report and presentation made at the Dissemination workshop; Annexes 4e and 11g), and a study and recommendations on market segment targeting in Ghana by Moniqeco Consultant (Annex 4f) are also presented. An additional result not previously reported was extra income earned by individual farmers via root sales through a contractual aggregator, E. Darkey Associates. A total of 240 individual farmers from Northern (Tamale), Upper West (Wa), Upper East (Bawku), Great Accra (Nsawam), Eastern (Akosombo), and Volta regions (Abor, Akasti, Ohawu, Dzodze) sold storage roots to E. Darkey for GHc 1/kg (~US $0.25) with additional root sales in local markets. In 2016, E. Darkey bought 27.7 tons (t) and in January 2017, another 3.2 t of OFSP storage roots. From January 2016 to January 2017, a total of $7,725 (GHc 30,900) were earned by farmers as additional income. Each farmer earned approximately $32 (GHc 129). Prior to the project, none of the farmers generated income from sweetpotato (reported in the 2015 Annual Report, submitted in April 2015).

Market model in Nigeria. CIP focused on a formal market presented by the school-feeding program in Nigeria, and hence we do not report many diversified market activities, though we have realized that these are indeed important for sustaining OFSP market demand, particularly when students go on vacation. The O-Meals program in Osun State and Partnership for Child Development were key partners for the entry of OFSP to the school feeding market. Table 1 presents results of the school-feeding effort from January 2015 to December 2016, when a pilot with 8 schools started, through December 2016, by which time 186 schools were including OFSP on the menu once per week. The information in Table 1 is drawn from the Y2 Annual Report (2015–2016) and the Y3 Midterm Report (2016–2017) through December 2016. Once a week, children are served a balanced meal including sweetpotato pottage, a dish containing mashed sweetpotato, fish, oil, and spice.

Table 1. Summary of school-feeding program intervention in Nigeria and its impact on expanding root production area and vine production including indirectly vine production area, and income generation

Items	Jan. 2015 (started)	Sept. 2015	Dec. 2016
Number of school	8	17	186
Number of pupils	4,329	8,157	41,426
Number of local government areas	8	15	24
Number of root producers	6	20	83
Total of OFSP root sales (t/week)	1.08	2.04	10.63
Revenue received by root producers (Naira/week)	78,643	148,548	766,689
Number of caterers (all women)	55	114	776

Note: Exchange rate: US $1 = 450 Naira.

At the outset, project staff were heavily engaged in coordinating production and supply of OFSP to caterers at the schools. However, as the number of schools increased, producers took over coordination of marketing efforts. The inclusion of nutritious OFSP, made with an early maturing, high yielding cultivar (Mother's Delight) in the meal was convenient and profitable for both caterers and producers (see Tables related to profitability of root, vine, wholesale and caterer businesses under the cost-benefit analysis below). In the last year, expanding demand was met, in part, through engagement of Osun State's youth employment scheme (O-YES), which encouraged and assisted its members to enter into OFSP production. Enterprising youth have contributed to both supply of roots for schools and to marketing OFSP through urban retail markets. Bread is included in one of the O-Meals meals, and in one LGA OFSP bread is being offered in a number of schools, and there are plans to expand this offering. Annex 11l contains the presentation made by Mrs. Bunmi

Ayoola, the O-Meals program Director at the Jumpstarting dissemination workshop, and Annex 11m presents initial findings from a study to understand best approaches to encourage acceptance of the OFSP by students in Osun State, and showed that use of songs and inspirational figures were effective motivators of consumption. Annex 5a provides complementary information about the program from a press visit organized by CIP in May 2017. Kwara State in Nigeria was targeted to a lesser extent than Osun State, but some project activities were conducted there, with seed system and market linkages strengthened through collaboration with NRCRI (see its final report in Annex 5b).

Market Model in Burkina Faso. The intervention in Burkina Faso focused on informal markets, introducing OFSP varieties into the existing commercial sweetpotato production and market chains. Under the project, commercial sweetpotato producers in Kenedougou Province were targeted to introduce OFSP, and strengthen their market linkages. Coincidentally, radio programming of a Farm Radio International project contributed to raising awareness. The Jumpstarting project introduced seed and crop production of new OFSP varieties developed by the INERA partner, and helped to create demand for them. The new OFSP varieties did not yield as well as the predominant commercial white-fleshed variety, but production was adequate and, in the event, compensated for by a price premium. By working with producers, marketers and processors, and project partners, and through targeted awareness and demand creation events and activities, partners were able to stimulate the value chain actors to work together to produce and sell increasingly large volumes of OFSP. (The project introduced a purple-fleshed sweetpotato cultivar which was liked by producers and consumers and is likely to enter into value chains.) Most of the project outcomes were already reported in the October 2016 midterm report. Hence, reports from the implementing partners (IPs) INERA and iDE focused on overall analysis for 3 years, lessons learned, and what changes have been noted after completing the project intervention. The partners' reports can be found in Annexes 6a, 6b, and, with some economic analysis of sweetpotato enterprises, Annex 9a (excerpted tables in cost-benefit section below). Presentations summarizing each of these reports were also made at the Jumpstarting project Dissemination meeting and are presented in Annexes 11f, j, and k.

Q2: What is the cost of the pilot for each model?

Background on implementation. Following 3 years of project implementation, value chains are just starting to move in Ghana, Nigeria, and Burkina Faso. Our observation is that each market intervention proved to be successful by the end of the project. Since efforts were focused in each country, it is easy to determine the investment in each country. But this does not present an adequate analysis of the cost of each model, since a mix of models was used in Ghana; and the simple models used in Nigeria and Burkina Faso also involved significant investment in activities that contributed to and supported diversified informal and formal markets for fresh and processed products. Actor-centered impact pathways were designed to help guide achievement of the project's milestones during the project implementation period. CIP, together with the actors and IPs, further defined and streamlined the project proposal. This resulted in four basic principles as a roadmap for managing the project: (1) the seed dissemination program was streamlined and its approach was for sustainability; (2) farmers were at the center of the ToC, with a strong focus on gender-equitable results; (3) linkages between breeding and seed systems were rationalized to be based on a market-driven approach; and (4) a PPP in the sweetpotato value chains was mapped to clearly target project outputs and outcomes.

Strategies for implementation. A sweetpotato-growing calendar considering the uni-modal rainfall distribution pattern was spelled out. Most project areas in the three countries have this rainfall pattern except Osun State, Nigeria, which has a weakly bi-modal rainfall distribution pattern. The defined vine multiplication technique in the sweetpotato seed systems fits this sweetpotato calendar. The FEWSNET calendar (Fig. 1 above) was used since it highlights the hunger period; our intervention was designed to address this period. We also advised farmers to draw their own calendar during training and sensitization at the community level. For capacity building the project actively backstopped an adult training program through training of trainers (ToT) on "Everything you need to know about sweetpotato," conducted in Burkina Faso, Nigeria, and Ghana in 2015–2017. ToT participants came from Ghana, Nigeria, Burkina Faso, and many countries both from within SSA and outside of Africa. The majority were extensionists and NGO workers from the Jumpstarting project target areas. In 2015, the project provided financial support to the institutions managing the ToT. The budget was within the project research framework, and two institutions started running the ToT program by themselves by 2016 and 2017. For instance, the Agriculture Research Management Training Institute in Nigeria has managed the ToT through their own resources since 2016 and into 2017. KNUST in Ghana conducted the ToT in May–June 2017 with trainees paying the costs of attending. This is a clear indication of a positive impact from the partners that they owned the OFSP training program and took the initiative without being financed by the project. Although the institutions managed from their own resources, CIP scientists were invited to backstop the training on the technical part, such as providing the ToTs with information, education, and communication (IEC) materials, and teaching the participants via an adult learning approach. Moreover, Good Agricultural Practices (GAPs) brochures and promotional materials (e.g., umbrellas, T-shirts, etc.) were distributed to farmer beneficiaries. All details have been reported in the October 2016 midterm report. Just recently (May 2017), a book entitled *Sweetpotato cropping guide* has been published (Annex 7a; http://africasoilhealth.cabi.org/materials/sweetpotato-system-colour-cropping-guide/). It is a collaborative effort between CIP and the CABI publisher. Annex 7b contains a presentation on planting material production dissemination made at the ToT recently conducted by KNUST in Kumasi.

Results and initial impacts

Commercial seed sales. Since commercial seed systems are a major element that will likely underpin the development of value chains, information on planting material production and sales under the project are important to understand progress in this area. At the outset, most farmers produced their own planting material, whether for commercial production of sweetpotato or home use. The project initially subsidized development of commercial seed producers, with the assumption that this would be short-lived as commercial demand developed. Data collected from routine monitoring and evaluation (M&E) reported by IPs was compiled and are presented in Table 2. The data from Burkina Faso, Nigeria, and Ghana were from three seasons between 2015 and 2016, and aimed to investigate OFSP vine sales. The assumption was that the vines can be sold when farmers have a market for their OFSP storage roots. Various markets can be created through the OFSP value chains and institutional markets to give opportunities for root producers to sell their OFSP storage roots. Through ToC assigned for this project, we have designed various market models fitting the Jumpstarting project intervention in West Africa. Data could be taken from three seasons, two rainy seasons (2015 and 2016) and one dry season (2016). Table 2 presents information on the acceptance of the test hypothesis; namely that through diversified markets the OFSP vine producers can sell their vines when the informal and formal markets for storage roots are created in the OFSP value chains. Results were also presented at the triennial meeting of the International Society for Tropical Root Crops-Africa Branch Dar-Es-Salam in March 2017 (Annexes 8a, 8b).

Table 2. Revenues from vine sales taken in the three seasons (rainy seasons in 2015 and 2016, dry season in 2016) in target areas of the Jumpstarting project

Country	Revenue from Vine Sales (US$)	Various interventions linking to market model	Percentage from Total Vine Sales (%)	Was It Subsidized? (Yes/No)
Burkina Faso	55,362	Informal markets through open markets (rural and urban)	55.4	No
		Increased number of decentralized vine multipliers (DVMs); this is a formal market because funds came from Jumpstarting project through INERA.	44	Yes
		Food security, a formal market through the Catholic Relief Services and Ministry of Agriculture bought vines from NAFASO, a commercial seed company and distributed the OFSP vines to farmers (farmers got free planting material) meanwhile NAFASO got free planting material from INERA only to start with, and no free planting material received afterwards.	0.6	Yes/No
Nigeria	27,230	Formal market for storage root sales to the school-feeding program and vine sold by DVMs to root producers	100	No
Ghana	21,989	Informal markets (open markets)	56	No
		Formal market (GHS), a willingness-to-pay study in this report will show interesting results	27	Yes
		Increased number of DVMs (formal markets), the initial free vines came from the Jumpstarting project through ACDEP	1	Yes
		Establishment of root producers, a formal market from the Jumpstarting project through ACDEP and CIP/Ministry of Food and Agriculture. The initial vine cuttings given to DVMs free of charge to create root markets at GSFP (formal market)	16	Yes
		Bakeries, OFSP golden bread, product development; formal market		
		Local markets		
Total	**104,581**	**Through diversified markets? YES, a commercialized planting material can be encouraged**		

Cost–benefit studies of value chain enterprises. Case studies were conducted in Burkina Faso, Nigeria, and Ghana based on the unique intervention in each country in November–December 2016, and used both primary and secondary data. Primary data were mainly cross-sectional and collected from a sample of the different chain actors in the two countries, and related to the 2015–2016 producing season. In each country, efforts were made to stimulate production to meet the market development/demand creation, as explained earlier in this report (see details of this study in Annex 9a). Results showed that across the board OFSP production and marketing were profitable contributing to success of overall efforts to create wealth and health. The gross margin analysis for vine multipliers, root producers, wholesalers and retailers, and school lunch caterers, as well as the cost of a bakery in Ghana are presented in Tables 3–8 for each country where relevant. Comparisons with other crops for production are not given, but results indicate profitability, and farmers will respond to demand where there are markets. In the case of school lunch caterers, the sweetpotato meal could be seen to be more profitable than the other meals (yam and beans) at the time of the studies, though this might vary seasonally. In the case of bread, sweetpotato bread was calculated to give a 75% return on investment compared to 25% for sugar bread and a loss for butter bread (Annex 9a), but still represented a small portion of the overall business, indicating the attractiveness of expanded production for the baker.

Table 3. Gross margin analysis for vine producers

Countries	Ghana		Nigeria		Burkina Faso	
	GHC	USD	Naira	USD	FCFA	USD
Farm size (ha)	0.27		0.6		0.026	
Quantity of vines used (bundles)	118.24		176		85	
Price of vines (per bundle)	5	1.12	300	0.95	60.00	0.11
Vine production costs						
Vines used	591.2	132.85	52650	166.61	2700.00	4.93
Fertilizer	42.5	9.55	26,100	82.59	2400.00	4.38
Manure	0	0.00	2,500	7.91	900.00	1.64
Pesticides	0	0.00	2,850	9.02	1000.00	1.83
Irrigation	34.6	7.78	34,910	110.47	13200.00	24.12
Water management	37.6	8.45	2,500	7.91	0.00	0.00
Labor	257	57.75	288,750	913.77	3624.40	6.62
Transport	30	6.74	0	0.00	5900.00	10.78
Others cost	61	13.71	0	0.00	0.00	0.00
Total cost	**1053.9**	**236.83**	**410,260**	**1298.29**	**29,724**	**54.31**
Vine yield (bundles/ha)	1990.30		6901.67		27307.69	
Root yield (kg/ha)	2432.28		944.04		3461.54	
Quantity vine (bundles)	537.382		4141		710	
Price per bundle	5	1.12	200	0.63	60.00	0.11
1st Revenue vine (Rev1)	2,687	603.80	828,200	2620.89	42,600	77.83
Quantity of roots (bags)	7.22		9.44		1.80	
Price per bag	40	8.99	3500	11.08	2725.00	4.98
2nd Revenue root (Rev2)	288.67	64.87	33,041.54	104.56	4,905.00	8.96

Total revenue (Rev1+Rev2)	**2,975.58**	**668.67**	**861,241.54**	**2725.45**	**47,505.00**	86.79
Total cost/ha	3903.3333	877.15	683,766.67	2163.82	1,143,246.15	2088.77
Total revenue/ha	11,020.65	2476.55	1,435,403	4542.41	1,827,115	3338.24
Gross margin	**7,117.32**	**1599.40**	**751,636**	**2378.59**	**683,869**	1249.47
Benefit relative to cost incurred	**182%**		**110%**		**60%**	

Note: US $1= 316 Naira; $1 = 4.45 GHC; $1 = 547.329 FCFA (*Source: field survey in 2016).*

Table 4. Gross margin analysis for root producers

Countries	**Ghana**		**Nigeria**		**Burkina Faso**	
	GHC	**USD**	**Naira**	**USD**	**FCFA**	**USD**
Farm size (ha)	0.216		1.26		1.15	
Production costs						
Labor	130.20	29.26	41809.78	132.31	123100.00	224.91
Purchased vine	20.40	4.58	66127.78	209.27	4203.20	7.68
Fertilizer	10.00	2.25	52300.00	165.51	34300.00	62.67
Manure	20.50	4.61	0.00	0.00	500.00	0.91
Pesticides	0.00	0.00	31750.00	100.47	2200.00	4.02
Irrigation	0.00	0.00	0.00	0.00	9600.00	17.54
Transport	2.00	0.45	681.82	2.16	5300.00	9.68
Total cost	**183.10**	**41.15**	**192669.37**	**609.71**	**179203.20**	**327.41**
Total cost/ha	**847.67**	**190.49**	**152691.87**	**483.20**	**155828.87**	**284.71**
Root yield (kg/ha)	7899.31		9414.03		20666.67	
Quantity (bags)	18.75		197.98		162.00	
Price	39.00	8.76	3050.00	9.65	2725.00	4.98
Total revenue	731.25	164.33	603839.00	1910.88	292000.00	533.50
Total revenue/ha	3385.42	760.77	478546.76	1514.39	253913.04	463.91
Gross margin/ha	2537.75	570.28	325854.89	1031.19	98084.17	179.21
Benefit received in relation to cost incurred	**299%**		**213%**		**63%**	

Note: The size of the OFSP bag varies between countries. In Nigeria 1 bag is 60 kg, in Ghana it is 91 kg, and in Burkina Faso it is 50 kg. US $1= 316 Naira; $1 = 4.45 GHC; $1 = 547.329 FCFA (*Source: field survey in 2016).*

Table 5. Gross margin analysis of the wholesalers per month

Countries	**Ghana**		**Nigeria**		**Burkina Faso**	
	GHC	**USD**	**Naira**	**USD**	**FCFA**	**USD**
Transport cost, including taxes on the roads	86.68	19.48	9,568	30.28	43500.00	79.48
Labor cost	26.76	6.01	1,936	6.13	2100.00	3.84
Total cost	**113.44**	25.49	**11,504**	36.41	**45,600**	**83.31**
Quantity bought per month (bags)	12.41		34		84	
Average buying price per bag	50.96	11.45	2,800	8.86	3750.00	6.85
Average sales price per bag	64.61	14.52	3,800	12.03	4750.00	8.68
Total cost per bag	9.14	2.05	338	1.07	542.86	0.99
Marketing margin per bag	4.51	1.01	661.65	2.09	457.14	0.84
Marketing margin per month	55.91	12.56	22496.00	71.19	38400.00	70.16
Benefit in relations to expended cost	**49%**		**196%**		**84%**	

Note: The size of the OFSP bag varies between countries. In Nigeria 1 bag is 60 kg, in Ghana it is 91 kg, and in Burkina Faso it is 50 kg. US $1= 316 Naira; $1 = 4.45 GHC; $1 = 547.329 FCFA (*Source: field survey in 2016).*

Table 6. Gross margin analysis of the retailers per month

Countries	**Ghana**		**Burkina Faso**	
	GHC	**USD**	**FCFA**	**USD**
Transport cost, including taxes on the roads	126	28.31	4375	7.99
Labor cost	40	8.99	687.5	1.26
Total cost	**166**	37.30	**5062.5**	**9.25**
Quantity bought per month (bags)	5.63		10.25	
Average buying price per bag	64.61	14.42	4750	8.68
Average sales price per bag	145.6	32.72	6250	11.42
Total cost per bag	29.50	6.63	493.90	0.90
Marketing margin per bag	51.49	11.57	1006.10	1.84
Marketing margin per month	289.68	65.10	10312.50	18.84
Benefit in relations to expended cost	**175%**		**204%**	

Note: The size of the OFSP bag varies between countries. In Nigeria 1 bag is 60 kg, in Ghana it is 91 kg, and in Burkina Faso it is 50 kg. US $1= 316 Naira; $1 = 4.45 GHC; $1 = 547.329 FCFA (*Source: field survey in 2016).*

Table 7. Gross margin analysis of school lunch caterers

Meal Ingredients	Ghana (GHC)		Nigeria (Naira)		
	Rice	OFSP	Yam	Rice	OFSP
Main ingredient	220	40	910	1280	686.6
Onion	15	6	96	82	84
Pepper (chili)			66	54	54
Pepper (Tatashe)	3.5	1.25	50	56	50
Palm oil	21.5	21	405	340	296
Salt	1.5	1.75	26	26	16
Fish	11.5	8.5	440	510	390
Water	2.5	0.9	50	54	42
Seasoning	7.5	7.5	62	90	48
Other	5	28	72	60	40
Average total cost	288 ($64.72)	114.9 ($25.82)	2177 ($6.85)	2552 ($8.03)	1706.6 ($5.37)
Average cost per pupil	**0.67 ($0.15)**	**0.28 ($0.06)**	**40.13 ($0.13)**	**47.54 ($0.15)**	**31.62 ($0.1)**
No. of pupil	875	875	230	230	230
Feeding Revenue	0.8 ($0.18)	0.8 ($0.18)	65 ($0.21)	65 ($0.21)	65 ($0.21)
Total revenue	**700 ($157.30)**	**700 ($157.30)**	**14,950 ($131.92)**	**14,950 ($131.92)**	**14,950 ($131.92)**
Total cost	586.25 ($130.84) (84%)	245 ($55.06) (35%)	9230 ($29.03) (62%)	10,934 ($34.38) (73%)	7273 ($22.87) (49%)
Total profit	113.75 ($25.56) (16%)	455 ($102.25) (65%)	5520 ($17.36) (38%)	4016 ($12.63) (27%)	7677 ($24.14) (51%)
Benefit to cost incurred	**19.53%**	**118.57%**	**59.8%**	**36.73%**	**105.55%**

Source: field survey 2016.

Table 8. Operating cost for a bakery per week

Raw Materials	Sugar Bread			Butter Bread			OFSP Bread		
	Quantity	Unit Cost (GHc)	Total Cost (GHc)	Quantity	Unit Cost (GHc)	Total Cost (GHc)	Quantity	Unit Cost (GHc)	Total Cost (GHc)
Wheat flour (kg)	26,250	2.9	76,125.00	350	2.9	1,015.00	525	2.9	1,522.50
Sugar (kg)	4,599	3.3	15,176.70	7.84	3.3	25.87	0	3.3	-
Yeast (kg)	17.325	26	450.45	0.31	26	8.06	0.35	26	9.10
Margarine (kg)	1,968.75	6	11,812.50	19.69	6	118.14	39.38	6	236.28
Salt (kg)	262.5	5	1,312.50	3.5	5	17.50	5.25	5	26.25
Flavor: nutmeg (kg)	31.5	150	4,725.00	0.42	150	63.00	0.42	150	63.00
Essence	0	75	-	0	75	-	0	75	-
Milk powder (kg)	42	48	2,016.00	1.33	48	63.84	2.66	48	127.68
Mix spices	0	74	-	0	74	-	0	74	-
Egg	0	15	-	3.15	15	47.25	0	15	-
Baking powder	0	60	-	0	60	-	0	60	
Bread improver	0		-	0		-	0		-
Preservative: calcium propionate	0		-	0		-	0		-
Water (L)	10,500	0.025	262.50	140	0.025	3.50	7	0.025	0.18
OFSP puree	0		-	0		-	525		-
Other									
Firewood			1,000.00			1,000.00			1,000.00
Electricity			250.00			250.00			250.00
Feeding			2,975.00			2,975.00			2,975.00
Housing			650.00			650.00			650.00
TOTAL			116,755.65 ($26,237.22)			6,237.16 ($1,401.61)			6,859.99 ($1,541.57)

Note: 1 Dollar = 4.45 GHC (*Source: field survey 2016)*

Q3: Which of these models would be most likely to be successful if implemented at scale?

Table 9 presents a summary of market models piloted under the Jumpstarting project, including promising points and challenges. Then we discuss considerations for expanded implementation at scale.

Table 9. Summary of promising points and challenges of market models piloted under the Jumpstarting project by country

Country	Model	Promising points	Challenges
Burkina Faso	Informal (non-contractual) production and marketing system in Kénédougou Province (South-	(1) OFSP roots have been accepted by the wholesalers indicated by their pre-order of 2,500 tons of OFSP roots before the planting season of 2016 (July) to be ready at harvest in October 2016; (2) OFSP vines were sales reaching up to Mali; (3) Ministry of Agriculture consistently bought OFSP vines from NAFSO, a commercial sweetpotato vince producer, to be given to	(1) accurate data for monitoring its upscale situation; (2) wholesalers can't buy OFSP at the farmgate due to small-scale farmers with their small sized land; (3) natural shelf-life of OFSP varieties is short, therefore the sellers cannot keep them in the store for a relatively long

	western Burkina Faso).	poor/vulnerable farmers to support the national food security program nation-wide; (4) International NGOs such as HKI and CRS bought OFSP vines from INERA and DVMs and expanded the OFSP intervention in other provinces in the Northern parts of Burkina Faso); (5) iDE-Burkina Faso planned to extend the OFSP value chains to the Eastern parts of Burkina Faso through a USAID project; (6) 20 trained OFSP processors and some food vendors are ready to market their products; (7) Innovation platform for OFSP value chains has been established.	period of time; (4) QDPM was only introduced in 2016 and practiced in the project areas. It may not be practiced under new management of expanded organizations as it is not fully in line with seed regulations; (5) farmers may continue receiving free OFSP planting material from the government and NGOs; (6) Burkina Faso has no well function tissue culture lab to produce pathogen-tested planting material.
Nigeria	(1) In Osun State, the O-Meals school-feeding program structured (but still non-contractual) market; (2) In Kwara State, rural and urban market (informal market).	(1) School feeding program in Osun State has expanded from 8 schools in 8 LGAs (in Jan 2015) to 186 schools in 24 LGAs (in Dec 2016); (2) O-Yes, youth employment program of the Osun State started using OFSP as an entry point for their graduates to start business; (3) The Federal Government has accepted to include OFSP in the school meals nation-wide; (4) Informal market in Kwara State has started with demo-plots and established 7 groups of root production comprising 110 farmers (36% women). This has been included in the routine activities of the national research program, NRCRI. There will be a good prospective to have OFSP in the open markets (informal market); (5) e-Health Africa NGO working in Kano has started with OFSP multiplication and production backstopped by Jumpstarting since 2015; (6) Dept. of Agriculture has accepted to include the QDPM protocol produced by Jumpstarting aligned with the other seed classes to complete the Quality Declared Seed (QDS) in the agriculture system of Nigeria.	(1) Political instability in Nigeria; (2) Effort on the OFSP school menu in all states can be a big challenge in the beginning, since the Jumpstarting project worked only in two states in the period of April 2014-March 2017; (3) upscaling the postharvest handling and storage system need a funding project; (4) Nigeria does not have a well function tissue culture lab to produce pathogen-tested planting material; (5) Grading on root quality has been done by the Jumpstarting project. This needs to consider.
Ghana	A mix of structured and informal market approaches in two initial target areas: Upper East and Northern Region.	(1) Expansion of area of production and increase of consumption, various utilization and processed products due to awareness demand creation campaign and trainings/sensitization/advocacy regarding the knowledge on nutritional benefit from OFSP; (2) farmers easily found OFSP vine cuttings and fresh storage root sales at the rural and urban fresh root markets informal market); (3) through the community health center of the GHS during counseling facilitation (structured market); (4) GSFP (structured market); (5) increase of demand by the international and national organizations and private sector—that is, Min. of Agriculture for food security, nutrition and investment program; local NGO TRAX-Ghana; international NGOs MEDA, GIZ, USAID-RING, USAID-SPRING, WFP, IITA (Nigeria), HKI, HarvestPlus (Nigeria), etc.; private sector (soon): HZPC (The Netherlands), McCain (USA), others; (6) Sweetpotato Innovation Platform has been established nationally and regionally; (7) QDPM protocol has been produced for Ghana, and it will complement the QDS which is going to be introduced by the government in the sweetpotato production system; and (8) Ghana has a well function tissue culture lab to produce pathogen-free SPVD.	(1) Transportation of storage root can be a challenge as can be OFSP root sorting and grading. Farmers need to know and sell quality roots for keeping up with high demand and good price in the market. Therefore, there is a need to train farmers. (2) Training on QDPM needs to be considered by NGOs when continuing to invest in their program on OFSP in its value chains. (3) Grading for root quality has not been handled by the Jumpstarting project. (4) Monitoring to get accurate scaling information could be a challenge for various partners.

On the basis of initial observations, at this moment the informal markets for root sales have the most potential for going rapidly to scale since farmers already recognize these markets in project pilot areas, can easily access these markets and produce for market or home consumption. For scaling up, we need to pay more attention to best management practices including storage root grading, postharvest handling, and transportation. The second easily expandable model is the school-feeding program, particularly in Nigeria. Markets for OFSP processed products such as bread and gari also have tremendous potential. For upscaling, breeding for end-users and quality attributes is crucial. Quality control to ensure QDPM standards at the community level, led by lead farmers and extension officers, and linked to pre-basic and basic seed programs will help to build profitable value chains. Assurance of a market for storage roots is significantly important to maintain the demand for vine sales. While going to scale and addressing new market opportunities, it will be important to monitor and continue to encourage market opportunities for smallholder farmers to ensure their continued benefit from sustainable nutrition value chains by careful and limited use of subsidies for the most vulnerable beneficiaries.

Outcome 2. Viable QDPM seed systems in target areas capable of expansion in response to increased demand.

Potentially valuable techniques to improve the utilization of the commercial seed systems were tested with farmers in each country and are reported in Annex reports of INERA and NRCRI (Annexes 5b and 6a). The farmer participants chosen from multipliers and root producers were trained before conducting demonstration trials (Table 10 summarizes these project outputs from Ghana). Results of one set of studies to understand the value of net tunnels used to multiply apparently healthy and pathogen-tested planting materials in northern

Ghana were published in Open Access de Gruyter (Annex 4h; DOI 10.1515/opag-2017-0026). Clean planting materials and net tunnels appear to be useful tools to help farmers to maintain yield of their varieties, particularly in areas where incidence of sweetpotato virus disease is a problem.

Table 10. Four on-farm demonstrations or evaluation efforts related to GAPs and seed production

Type of Improved Technology	Description	Target Community/Region	Achievement and Comments
1. GAP demonstration with fertilizer experiment	4 varieties ('Nan', 'Obari', 'TU-Purple', and 'Apomuden') were with 3 levels of soil amendment treatments: 1 = fertilizer (NPK 40:40:70 kg/ha at 5 weeks after planting); 2 = manure (10 t/ha at day of planting); and 3 = no soil amendment (control). Randomized control trial design was used with communities as replications (blocks). Farmers participated in all agronomic activities—from land preparation to harvesting.	Northern region (Golinga, Botanga) and UER (Naaga, Ninsum)	Field data were collected and analyzed. Results on root yield performance are presented in Annex 4g, Table 2. About 38 farmer groups (178 households) were trained in the 2 regions on how to prepare ridges, plant, apply fertilizer, and harvest sweetpotatoes.
2. Triple S and double S demonstrations	2 varieties ('Nan' and 'Apomuden') were used for each demonstration. About 12 set-ups each of Triple S and Double S were demonstrated to participating farmers in 6 communities. Roots were obtained from the GAP demonstration plots.	Northern region (Golinga, Botanga, Chirifuyili) and UER (Naaga, Sumbrungu, Ninsum)	38 farmer groups (178 households) were reached, of which 7 were DVMs. A follow-up was made for participatory evaluation of the set-ups. Evaluation results are presented
3. Net tunnel demonstration	This demonstration targeted DVMs in 6 communities in the target regions. Two varieties ('Nan' and 'Apomuden') were used with 2 treatments: 1 = inside net and 2 = outside net. This was to demonstrate to farmers the benefits of conserving vines under net during the harmattan period. Number of cuttings planted in net tunnel = 150 (75 per variety) Number of cuttings planted outside net tunnel = 150 (75 per variety) Number of net tunnels = 4	Northern region (Golinga, Botanga, Chirifuyili) and UER (Naaga, Sumbrungu, Ninsum, Pusiga)	About 15 DVMs were trained on how to construct net tunnels. A follow-up has yet to be made for participatory comparative assessment of planting material quality after the harmattan period (3 months' time).
4. Sweetpotato crop cut yield assessment on farmer field	This was by sampling 10 farmers across 2 regions (Northern and Upper East). On each farmer's field, 3 portions of $4m^2$ were randomly sampled and harvested; roots were counted and weighted. Averages were obtained and yield (t/ha) was calculated for each farmer field and finally the mean yield (t/ha).		Mean root yield for Upper East was 20.38 t/ha, that of Northern was 23.77 t/ha. Grand mean root yield across both regions was 22.08 t/ha. About 30% of the farmers sampled do not practice crop rotation but apply fertilizer. These are mostly from Bawku in the UER where sweetpotato is a cash crop.

Q1: What are the critical factors in producers' decisions to adopt or not adopt OFSP under different agro-ecological settings and different market conditions?

The major factor influencing producers' decisions to adopt OFSP were related to **existence of market**. Furthermore, it was related to the availability of planting material of varieties that were productive, which was dependent on seed system capacity to deliver clean planting material and on the availability of suitably adapted genotypes from breeding programs. In addition to markets, home consumption was important for most producers. Since OFSP types were not well known in Ghana or Nigeria before the intervention, and since dry matter tends to be low in OFSP varieties compared to the white or yellow-fleshed staple type sweetpotato, it was important that efforts be made to create awareness of nutritional value of OFSP along with suitable methods (recipes) for fresh consumption, and uses in processed products (such as bread) for which there is emerging market demand. This awareness creation/marketing was critical both for consumer and producer acceptance for home consumption. In Ghana and Nigeria, adequately high yielding, but low dry matter content OFSP varieties were available during the project, though there was a recognition of the need for new varieties, and hence tight linkage of the project with breeding efforts were important. In Burkina Faso, as mentioned, the OFSP varieties used were not as high yielding as commercially important white-fleshed varieties, but nutrition and utilization information was easily used to create market demand. The agroecologies covered by project efforts ranged from the forest zone in Osun State, Nigeria, to savannahs in Ghana and Burkina Faso. A key difference between the forest and savannah agroecologies is the degree of virus pressure, with pressure typically being higher in the forest. This was not a serious constraint under the project, however, even though the Mother's Delight variety used in the forest zone of Nigeria is relatively susceptible to virus, since management practices implemented in commercial seed systems are easily able produce adequate quantities of healthy planting material to meet demands.

While the project focused on OFSP and its promotion, our interventions with regard to improving seed system capacity do not need to be restricted to OFSP, and can be valuable in terms of implementing best practices for both planting material and root producers of all sorts of sweetpotato. It will be important to continue to monitor progress made under Jumpstarting, and where necessary, focus future interventions to ensure maximum continuing impact.

Q2: What can be done to decrease non-adoption?

Through our endline survey conducted in Ghana and Nigeria, we attempted to understand factors that contributed to adoption and non-adoption. A related question, related to rates of dis-adoption was not assessed, given the short time frame of the project. The "baseline/

midline" survey was conducted in 2015 and endline at the end of 2016 and early 2017. Burkina Faso was not addressed during the endline due to time constraints, and a relatively smaller producer population. We did however conduct cost benefit analysis (reported above, and reported on milestone achievements in Annexes 1 and 2). The endline study (Annex 10) aimed to examine the exposure to and adoption of OFSP and their determinants, estimate the dietary diversity of households (including women and children), examine the impact of OFSP and participation in improved nutritional knowledge trainings on nutrition status of households in the project zones in Ghana and Nigeria. The survey included participants in the project and their neighbors from the same communities. Individuals from other communities not targeted by the project provided a control group. We found that the awareness rate about OFSP varieties in the populations in both countries is still relatively low, but that this is the most important factor for adoption. Social interactions through participation in farmers' organizations/association play an important role in disseminating knowledge about OFSP among farmers in communities. Also, our findings showed that households with children under 5 years old were more likely to be aware of OFSP. These two effective approaches were used by the project team and partners during the implementation period. So they may continue to guide scaling up efforts.

Potential OFSP adoption rates were up to 61% in Ghana and 42% in Nigeria in 2016, instead of the observed sample adoption rate of 51% and 33% if the whole population were exposed to the OFSP varieties. This suggests that there is potential for increasing dissemination rate among population. Our study showed that the OFSP adoption is influenced by a number of factors, which varied between the study countries. This implies that actions to increase the adoption rate shouldn't be "one size fits all solution" approach, but should be country specific. For example, while adoption propensity was higher among the Nigerian sweetpotato producers who had been trained on sweetpotato production and management, it was higher among the Ghanaian sweetpotato producers who had higher interactional visits with extension service agents. We found that adopting the OFSP varieties increased households' (children as well as women) nutritional status significantly in Ghana only; its impact on the Nigerian respondents' nutritional status was not yet significant. Our findings also indicated improvements in nutritional status of households that participated in improved nutritional knowledge program in Ghana but not in Nigeria. These findings point to the importance of improving sweetpotato farmers' access to knowledge about OFSP varieties and their benefits that would play significant role in their adoption. Another important constraint to the adoption of OFSP has to be the availability of OFSP planting material. Our findings showed that most of the interviewed sweetpotato farmers in both countries sourced their planting materials from own farms, including the actual OFSP adopters. The observations in the fields were that even the OFSP producers just buy part of OFSP vines they need, and produce the remaining by themselves. In fact, one of the good sides of the JS project is its market driven approach where even vines have to be purchased which we know that sweetpotato producers were not used to at the beginning of the project. The implications for policy makers and development support partners is that further institutional supports are still needed to significantly increase OFSP awareness and adoption rates among communities, and therefore to spillover the positive and significant impacts of these actions on households' nutritional status. In Ghana, with its diversified project activities, nutrition awareness and household impact on dietary diversity were higher than in Nigeria, where our efforts focused more on serving the school-feeding market.

At the beginning of the project, we targeted 50% women producers. The experience during implementation was that this was difficult to achieve. Only about 14% of seed producers were female and 30% of root producers. However, the project served more than 50% women if the value chain is considered. Women were heavily involved in retailing of sweetpotato in all countries, in catering for school-feeding, and in processing. While the project focused on market development, we expected spill-over benefits from sweetpotato for home consumption; it was women who were more likely to grow for home use only.

For future work we will consider the most effective means of disseminating this knowledge, while continuing to ensure that markets maintain demand for high-quality planting material of suitable varieties. A comprehensive approach would include continuing efforts to ensure (1) availability of OFSP varieties with high yield; (2) strengthening of seed systems to ensure timely availability of clean planting material; (3) knowledge of sweetpotato production management, including seed multiplication and OFSP processing and utilization through training, producing IEC materials, and the like; (4) awareness–demand creation campaign, radio TV programs, sensitization, advocacy, promotional materials, participation in agriculture trade fairs, and such; and (5) creating market opportunities and value addition in the OFSP value chains. More than 117,000 people have been recorded as having knowledge of OFSP and benefiting from this crop (see Annexes 3–9 in the 2016 midterm report). For increasing impact in the future and decreasing non-adoption we will (1) continue to emphasize market development and demand creation, based on awareness of nutritional value and complemented by continued improvement of production and postharvest systems, handling and proper transportation; and (2) ensure continued strengthening of demand responsive breeding and seed systems to meet market demands and provide broad nutritional benefits.

Outcome 3. Households, including women and children, in target areas increase consumption of vitamin A from OFSP

This outcome was of broad interest to the overall project, and was addressed in the endline survey in Ghana and Nigeria specifically. As already stated, nutrition messaging about vitamin A and the health benefits of OFSP was at the heart of marketing efforts under the Jumpstarting project. However, most milestones under outcome 3 were specifically related to the GHS intervention, which emulated the Mama SASHA project conducted under SASHA 1 in Kenya. The GHS intervention targeted 5,000 pregnant or lactating women to receive nutrition counseling through the GHS in areas targeted by the project for development of commercial producer groups and vine multipliers. The women counselled received small samples of vines and roots, and their subsequent purchases or production of OFSP was assessed along with changes in nutritional knowledge and impact on household diets. Thus, the GHS intervention could be viewed as another market development effort. Data from the GHS endline survey have been analyzed, but these full results are still be written up.

Q1: How has the Jumpstarting project improved the nutritional knowledge among producers, traders, and consumers of OFSP, segregated by gender?

Nutrition messaging was at the core of Jumpstarting's market development efforts. The efforts included (1) ToT, considering adult education approach and farmers' field school method; we adopted the Essential Nutrition Actions introduced by UN-UNICEF; (2) publishing IEC materials; (3) creating 14 OFSP recipes using the local dishes and a poster with information that OFSP can be processed from low dry matter varieties; (4) conducting awareness campaigns, including radio programs; (5) cooking demonstrations via community health services; (6) using promotion materials such as T-shirts, banners with attractive information regarding health benefit and creating wealth, aprons and bread labels for bakeries, market and individual umbrellas; (7) promoting advocacy by village leaders, local leaders such as politicians and policymakers, and world leaders (Dr. Kofi Annan and his wife, Mrs. Nane Lagergren); and (8) through the GHS

counseling facilitation, targeting pregnant women, lactating mothers, and children under 5 to benefit from OFSP to be included in their daily diet. For ToT, the project strongly considered a gender-sensitive focus to be included in the training in order to ensure gender-equitable results.

The endline survey in Ghana and Nigeria showed a significant impact of the project on household nutrition status among households that adopted OFSP in Ghana but not in Nigeria. This is probably as a result of the more holistic and intensive targeting of communities and households in Ghana, where the GHS counseling was implemented in the same districts and often the same communities as the production efforts of the project. As already reported, households with children under 5 were those in which the greatest improvement in dietary diversity was recorded. In Nigeria, the focus was largely on production for the school-feeding market. OFSP had been included in the menu because of its nutritional value, but nutrition messaging to students and efforts to transfer this knowledge and OFSP back to the homes of the students did not receive much attention under the project. In retrospect, school-feeding represents a great entry point, yet to be exploited to get nutrition messages and behavior changes back to the students' households.

Q2: Does improved knowledge lead to increased consumption of OFSP?

Improved knowledge appears to lead to increased consumption of OFSP. This was shown in the endline survey for Ghana, where knowledge led to adoption of OFSP, and in particular cases, such as households with children under 5 (which had received nutrition messages) improved dietary diversity. Final results from analysis of the GHS endline remain to be reported. However, findings show:

1. School-feeding programs where students receive OFSP meals clearly lead to increased consumption of OFSP. In Nigeria, under Jumpstarting, ~41,000 pupils in 186 schools were receiving a weekly OFSP meal (Table 1). Evidence generated from the behavioral study (see preliminary results in Annex 11m) showed that the means of delivery of the nutritional message was very important (songs and posters were more effective than lectures). So the precise type of information that motivates increased consumption, and the way it is delivered, is quite important.
2. The result of a GHS willingness-to-pay survey showed that 15–16% of respondents from women beneficiaries returned to the farmers to buy vines and storage roots. This was after they received information about nutritional value of OFSP during visits to the GHS for their routine counseling services and receiving vines and storage roots through voucher from the GHS. Data from the GHS endline remain to be fully analyzed and reported, but repeat sales following counseling appear to provide quite strong evidence that knowledge improved consumption. Again, the precise motivation for the interest of the women in buying vines or roots may need to be further assessed.
3. As already discussed above in relation to adoption, in Ghana, adoption rate for OFSP was 61% and in Nigeria 42% in communities targeted by the project. Furthermore, 50% of respondents from Ghana mentioned the reason for growing sweetpotato was for food, as did 22% of respondents from Nigeria. In Burkina Faso, 170 OFSP farmers identified out of 294 under iDE-Burkina Faso management were consuming OFSP and also selling them in the market.

Outcome 4. Commercial sweetpotato planting material and OFSP producers, including women, increase income through participation in OFSP value chains

This final outcome combined elements of the first three. Yet it was the most difficult to actually assess precisely and conclusively, due in part to the size of emerging and seasonally dynamic markets, and to farmer reluctance to share precise financial information. Activities under this outcome included major efforts on capacity development for famer groups to engage in commercial activities, including market linkages, business management, production, and utilization. Best estimates of results related to the achievement of each of the milestones are reported in Annexes 1 and 2. Profitability of enterprises was already reported above, and the average volumes and figures for many of the producers show relatively low numbers. On average, sweetpotato was the third or fourth most important crop, so enterprise sizes for OFSP were relatively small. However, as these markets grow, and producers respond to them, it is expected that individual producer and value chain actor incomes will increase.

Q1: What is the impact of the Jumpstarting project work outside their direct beneficiaries (e.g., neighbors or nearby communities)?

Impact of the Jumpstarting project, if measured in terms of production of OFSP, was almost 90% among direct beneficiaries, between 50% actual and 60% potential for neighbors within target communities, and negligible in untreated communities. These results from the endline survey were already presented above (outcome 2, question 2). With knowledge and availability of OFSP and expanding markets, adoption is ongoing and accelerating. Interestingly, general educational levels among Ghanaian and Burkina Faso producers were very low (a few years of formal education) compared with those in Nigeria, where most had reached secondary school. Solutions for enabling illiterate farmers to be more effective managers will be required. While not indirect beneficiaries, per se, Jumpstarting project backstopped others regarding techniques through training and IEC materials, meetings and sensitizations, and/or OFSP planting material. These include USAID-RING (17 districts in Northern Region of Ghana); USAID-SPRING in 14 districts of UER; Canadian-MEDA NGO started with 2,000 women in Upper West Region of Ghana; Helen Keller International and Catholic Relief Service in Burkina Faso; e-health Africa NGO working in Kano, Nigeria; and the International Institute of Tropical Agriculture–Nigeria working in Osun State on young entrepreneurship using OFSP as their entry point. The source of planting material came from the DVMs established by the Jumpstarting project. In the Volta Region of Ghana, although not the primary focus of the Jumpstarting project, interest in OFSP is growing. New NGOs and private sector businesses are entering the market and value chains through projects of the Alliance for a Green Revolution in Africa and the International Fund for Agricultural Development. In March 2017, planting material was supplied to a GIZ project in Togo by commercial multipliers backstopped by the Jumpstarting project in the Volta Region. Similarly, in June 2017, vines were provided to another GIZ project, in Benin, by commercial multipliers established under Jumpstarting. There are many other additional commercial vine sales by multipliers supported by the project.

Q2: Which of the market models helped to increase incomes for OFSP producers?

So far, all market models have shown that farmers have increased their incomes, with the exception of the GSFP. Farmers did not want to supply their roots on credit. The cost-benefit analyses conducted (presented above) provide information on relative profitability as well. In terms of overall benefits of the project to producers at this point, data indicate that producers in each area where the project has conducted its pilot efforts have helped to increase producer incomes. Since incomes derive from markets, it also follows that the largest markets increased producer incomes the most. In Nigeria, school feeding represented a fairly reliable entry point. In Burkina Faso, the development of demand for OFSP in existing commercial markets presented good opportunities for producers in traditional sweetpotato

producing communities, and in Ghana the development of diversified markets in the Northern Region (around Tamale) was very promising as compared to the relative difficulty of producers in the UER to identify and serve commercial markets for OFSP. However markets for producers in the UER are now emerging as are farmers interested in serving them. This is well-detailed in the reports of ACDEP and iDE-Ghana (Annexes 4c, 4d).

Media visit to Volta Region

On 7 February 2017, mass media visited the Volta Region to highlight key achievements of the Jumpstarting project working toward ensuring profits for producers and nutritional benefits for a large population of consumers. Furthermore, the media visit highlighted CIP's work in a priority CGIAR country, considering the 2016 World Food Prize award on OFSP intervention in SSA. Hence, it was important to produce some success stories, particularly for Ghana. We hope to have transformation of the OFSP and/or sweetpotato crops within the agriculture policy. Links on various news and journalist reports are available in Annex 9b.

Dissemination Workshop

On 10 May 2017, a Dissemination workshop was organized in Accra, Ghana. The aim was to bring the results of the Jumpstarting project to a broader audience, including the Government of Ghana (policymakers and politicians), donor community, international organizations, and NGOs. The organizations that have planned to include OFSP in their program in Ghana can learn from some lessons from the Jumpstarting project. Therefore, they should start with a strategic effort for upscaling from the findings provided through this workshop instead of "starting from zero." We also aimed to bring the sweetpotato and OFSP crop to be written in the Government of Ghana's agricultural policy. We would like to ensure that a transformation occurs by 2018, when sweetpotato and/or OFSP crops are included in this policy. Annexes 11a–11o provide details of the Dissemination workshop, including the speech from the minister of food and agriculture (which was very promising), mass media reports, and the important messages for policymakers and politicians, as well as the theatre group from University of Ghana in Accra who presented during the workshop (Annex 10b).

Below is the list of annexes provided with this report:

1. ANNEX 1 JUMPSTARTING_OFSP_W Africa_Results Tracker.xlsx
2. ANNEX 2 ACHIEVEMENT.xlsx
3. ANNEX 3 CUMULATIVE SUMMARY-OUTCOMES AND MILESTONES-BURKINA FASO-NIGERIA-GHANA.docx
4. ANNEX 4a Lab Anaysis _ GARI_50% Cassava 50% Sweetpotato.doc
5. ANNEX 4b UDS_Final Report.docx
6. ANNEX 4c ACDEP - End of Project Report.docx
7. ANNEX 4d iDE Ghana End of Project Report.docx
8. ANNEX 4e CSIR-CRI End of Jumpstarting project Report and SASHA.docx
9. ANNEX 4f OFSP Marketing Plan in Ghana by Moniqeco.doc
10. ANNEX 4g REPORT - IMPROVED TECHNIQUE ON SEED SYSTEM.docx
11. ANNEX 4h SOURCE OF VINES_OP_PUB.pdf
12. ANNEX 5a PRESS REPORT - SCHOOL FEEDING PROGRAM - NIGERIA.pdf
13. ANNEX 5b JUDE NJOKU-NRCRI-END OF PROJECT REPORT.docx
14. ANNEX 6a INERA End of Project Report.pdf
15. ANNEX 6b iDE BF End of Project Report-OFSP.pdf
16. ANNEX 7a Sweetpotato cropping guide-CABI-ASHC.pdf
17. ANNEX 7b TRAINING OF TRAINERS-SEED DISSEMINATION.pdf
18. ANNEX 8a ISTRC-AB-ABSTRACT-Abidin et al-WEST AFRICA.pdf
19. ANNEX 8b ISTRC-AB ABIDIN-ET AL-ORAL PRESENTATION-MARCH 2016.pdf
20. ANNEX 9a OFSP Cost Benefit Analysis Report.pdf
21. ANNEX 9b Media visit to the Volta region report.pdf
22. ANNEX 10 Endline Report Ghana & Nigeria.docx
23. ANNEX 11a PROGRAM-DISSEMINATION WORKSHOP-10 MAY 2017.docx
24. ANNEX 11b Key messages for dissemination_ theatre group.doc
25. ANNEX 11c Ghana Country Manager Speech.docx
26. ANNEX 11d Minister-SPEECH.pdf
27. ANNEX 11e Jumpstarting DISSEMINATION.pdf
28. ANNEX 11f OFSP Value Chains_Nigeria and Ghana.pdf
29. ANNEX 11g CSIR-CRI-ppt.pdf
30. ANNEX 11h iDE-GHANA.pdf
31. ANNEX 11i GHANA HEALTH SERVICE.pdf
32. ANNEX 11j INERA.pdf
33. ANNEX 11k iDE BURKINA.pdf
34. ANNEX 11l O-MEALS-NIGERIA.pdf
35. ANNEX 11m School feeding Study_Nigeria.pdf
36. ANNEX 11n PRESS REPORT - DISSEMINATION -10 MAY 2017.pdf
37. ANNEX 11o PRESS REPORT- MINISTER AGRIC.pdf

2. Geographic Areas to Be Served

Provide the final list of countries and sub-regions/states that have benefitted from this work and associated dollar amounts. If areas to be served include the United States, indicate city and state. Add more rows as needed. More information about Geographic Areas to Be Served can be found here**.**

Location	Foundation Funding (US$)
Ghana	2,323,572
Nigeria	1,023,947
Burkina Faso	590,738

3. Geographic Location of Work

Provide the final list of countries and sub-regions/states where this work has been performed and associated dollar amounts. If location of work includes the United States, indicate city and state. Add more rows as needed. More information about Geographic Location of Work can be found here.

Location	Foundation Funding (US$)
Ghana	1,788,784
Kenya	301,114
Nigeria	470,594
Burkina Faso	318,639
Peru	1,059,126

4. Lessons Learned

Describe the top one to three takeaways or lessons learned from this project.

Three takeaways or lessons learned from this project:

1. Sweetpotato vines can be significantly valued and sold when farmers know that a market for them exists.
2. Diversified markets created by and designed through this project helped to create new opportunities for farmers to reposition sweetpotato, using OFSP as an entry point. Value chains started with vine production, storage root production, and processed products, such as bread and gari in Ghana, school meals in Nigeria, and fresh roots in the markets of Burkina Faso.
3. Having a steady market through the school-feeding program in Nigeria, and followed by Ghana, has changed farmers' mindset so that they are willing to include OFSP through the dry-season farming and significantly seek to improve cultural practices and postharvest handling.

5. Feedback for the Foundation

Provide one to three ways the foundation successfully enabled your work during this project. Provide one to three ways the foundation can improve.

During the course of the project, we had 3 different program officers, one who helped formulate the project, and two who took over during project implementation at different periods. This was problematic to project implementation, and both we and the program officers recognized this. Our last program officer worked with us closely to ensure that we would successfully deliver the grant outcomes. We were also disappointed with shifting Foundation program priorities from beginning to the end of the project, which restricted possibilities for a second phase. We are very grateful for the opportunity to have Jumpstarted orange-fleshed sweetpotato in Ghana, Nigeria and Burkina Faso, and will do our best to ensure that the work and value chains started under this project will continue to deliver the impact we hope for in the near future.

6. Global Access and Intellectual Property

If your funding agreement is subject to Intellectual Property Reporting, please click the following link to complete an Intellectual Property (IP) Report.

If not, please acknowledge by typing "N/A": N/A

To delegate permissions to another member of your project team or for any questions regarding the Intellectual Property Report, please contact GlobalAccess@gatesfoundation.org.

7. Regulated Activities

Do you represent that all Regulated Activities[1] related to your project are in compliance with all applicable safety, regulatory, ethical and legal requirements? Please mark with an "X":

_____ N/A (no Regulated Activities in project)

__X___ Yes

_____ No (if no, please explain below)

1 Regulated Activities include but are not limited to: clinical trials; research involving human subjects; provision of diagnostic, prophylactic, medical or health services; experimental medicine; the use of human tissue, animals, radioactive isotopes, pathogenic organisms, genetically modified organisms, recombinant nucleic acids, Select Agents or Toxins (www.selectagents.gov), Dual Use technology (http://export.gov/regulation/eg_main_018229.asp), or any substance, organism, or material that is toxic or hazardous; as well as the approvals, records, data, specimens, and materials related to any of the forgoing.

8. Subgrants

If your grant agreement (not applicable to contracts) is subject to expenditure responsibility and permits you to make subgrants to organizations that are not U.S. public charities or government agencies/instrumentalities, please complete the Subgrantee Checklist and attach a copy with this progress narrative for each such subgrantee. See below.

Subgrantee Checklist

Complete this form for each subgrantee that is not a public charity or government entity and create additional copies as required.

General Information

Investment Title	Jumpstarting Orange-fleshed Sweetpotato in West Africa through Diversified Markets		
Grantee/Vendor	International Potato Center		
Opportunity/Contract ID	OPP1081538	**Reporting Period Start Date**	April 4, 2014
Program Officer	Lauren Good	**Reporting Period End Date**	May 31, 2017

Subgrantee Checklist

Subgrantee Name	International Development Enterprises (iDE)–Burkina Faso
Subgrantee Address	1031 33rd Street #270 Denver, CO 80205, USA
Subgrantee Fiscal Year End	February 28, 2017
Date(s) Funds were Provided to Subgrantee	First Funds Transfer: 04/07/2014 Second Funds Transfer: 10/07/2015 Third Funds Transfer: 13/07/2016 Fourth Funds Transfer: 30/11/2016 Fifth Funds Transfer: 25/02/2017 Sixth Funds Transfer: 11/05/2017
Total Subgrant Amount (US$)	$ 130,000
Description of how the subgrant furthers the purpose of the grant project	iDE Burkina Faso was an essential NGO partner related to all outcomes of the project in Burkina Faso. They performed very well.
Amount of subgrant spent by subgrantee (US$) during most recent annual period (date of fund distribution through close of their fiscal year end) (based on most recent reports received from subgrantee)	$ 133,119.25
Amount and percentage of Subgrant spent by Subgrantee on indirect costs (US$)	Amount: $17,363.38 Percentage: 15%

Amount you distributed to Subgrantee during your reporting period (US$). This amount should be reflected on your budget spreadsheet in the subgrant category.	$133,119.25
To your knowledge, has the Subgrantee made any expenditure that was not consistent with the purposes of the Project approved by you or the foundation? If so, these may constitute diverted funds and additional action to recover such funds may be required.	No. All the expenditures made by the Subgrantee were consistent with the purpose of the Project and approved.

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Subgrantee Checklist

Complete this form for each subgrantee that is not a public charity or government entity and create additional copies as required.

General Information

Investment Title	Jumpstarting Orange-fleshed Sweetpotato in West Africa through Diversified Markets		
Grantee/Vendor	International Potato Center		
Opportunity/Contract ID	OPP1081538	**Reporting Period Start Date**	April 4, 2014
Program Officer	Lauren Good	**Reporting Period End Date**	May 31, 2017

Subgrantee Checklist

Subgrantee Name	International Development Enterprises (iDE)–Ghana
Subgrantee Address	1031 33rd Street #270 Denver, CO 80205, USA
Subgrantee Fiscal Year End	February 28, 2017
Date(s) Funds were Provided to Subgrantee	First Funds Transfer: 24/09/2014 Second Funds Transfer: 30/09/2015 Third Funds Transfer: 30/09/2015 Fourth Funds Transfer: 23/05/2016 Fifth Funds Transfer: 30/08/2016 Sixth Funds Transfer: 05/11/2016 Seventh Funds Transfer: 11/05/2017
Total Subgrant Amount (US$)	$ 210,000
Description of how the subgrant furthers the purpose of the grant project	iDE-Ghana was an essential NGO partner related to all outcomes of the project in Upper East Region of Ghana. They performed adequately.
Amount of subgrant spent by subgrantee (US$) during most recent annual period (date of fund distribution through close of their fiscal year end) (based on most recent reports received from subgrantee)	$ 210,000
Amount and percentage of Subgrant spent by Subgrantee on indirect costs (US$)	Amount: $ 27,391 Percentage: 15%
Amount you distributed to Subgrantee during your reporting period (US$). This amount should be reflected on your budget spreadsheet in the subgrant category.	$ 210,000
To your knowledge, has the Subgrantee made any expenditure that was not consistent with the purposes of the Project approved by you or the foundation? If so, these may constitute diverted funds and additional action to recover such funds may be required.	No. All the expenditures made by the Subgrantee were consistent with the purpose of the Project and approved.

Subgrantee Checklist

Complete this form for each subgrantee that is not a public charity or government entity and create additional copies as required.

General Information

Investment Title	Jumpstarting Orange-fleshed Sweetpotato in West Africa through Diversified Markets		
Grantee/Vendor	International Potato Center		
Opportunity/Contract ID	OPP1081538	**Reporting Period Start Date**	April 4, 2014
Program Officer	Lauren Good	**Reporting Period End Date**	May 31, 2017

Subgrantee Checklist

Subgrantee Name	Association of Church Based Development Projects (ACDEP)
Subgrantee Address	RC 70, Gumani Road, P.O. Box 1411-Tamale, Ghana
Subgrantee Fiscal Year End	February 28, 2017
Date(s) Funds were Provided to Subgrantee	First Funds Transfer: 13/02/2015 Second Funds Transfer: 15/10/2015 Third Funds Transfer: 15/10/2015 Fourth Funds Transfer: 12/07/2016 Fifth Funds Transfer: 13/09/2016 Sixth Funds Transfer: 11/05/2017
Total Subgrant Amount (US$)	$ 150,000
Description of how the subgrant furthers the purpose of the grant project	ACDEP was an essential NGO partner related to all outcomes of the project in the Northern Region of Ghana. They performed very well.
Amount of subgrant spent by subgrantee (US$) during most recent annual period (date of fund distribution through close of their fiscal year end) (based on most recent reports received from subgrantee)	$ 150,000
Amount and percentage of Subgrant spent by Subgrantee on indirect costs (US$)	Amount: $ 136,691.02 Percentage: 10%
Amount you distributed to Subgrantee during your reporting period (US$). This amount should be reflected on your budget spreadsheet in the subgrant category.	$ 150,000
To your knowledge, has the Subgrantee made any expenditure that was not consistent with the purposes of the Project approved by you or the foundation? If so, these may constitute diverted funds and additional action to recover such funds may be required.	No. All the expenditures made by the Subgrantee were consistent with the purpose of the Project and approved

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Financial Update

The purpose of the Financial Update section is to supplement the information provided in the "Financial Summary & Reporting" sheet in the foundation budget template, which reports actual expenditures. This section is a tool to help foundation staff fully understand the financial expenditures across the life of the project. Together, the Financial Update section and budget template ("Financial Summary & Reporting" sheet) should provide a complete quantitative and qualitative explanation of variances to approved budget.

Note: If you are using an older version of the budget template, this information could be in a different location in your template.

1. Summary

Briefly describe how total project spending compared against the budget and how your assumptions changed as the project progressed.

Project spending started out slowly, but implementation picked up fully by the end of the project. Unspent funds at the end of the project were unfortunately higher than ideal, largely due to underspending on salaries due to staff departures, and devaluation. The Jumpstarting Orange-fleshed sweetpotato in West Africa through Diversified Market project began its activities on April 2014, with an approved budget of US $4,000,000.

The total expenditure for project Y1 was $626,804, leaving a balance of $3,373,196 for the next 2 years. The most relevant variance during the first year was the expenses made in travel because we initially failed to budget adequately, not considering cost of accommodation. Also, there were far more trips than initially budgeted for, due to the need for both regional coordination and local travel. Finally, we expanded activities related to M&E and expansion of activities into a new area, the Volta Region, where sweetpotato is an important crop and the potential for developing OFSP value chains is high.

The other categories were developed according to the budget:

Budget Category	Budget Y1 (US$)	Expenses Y1 (US$)	Balance Y1 (US$)
Personnel	424,308	166,867	257,441
Travel	47,570	72,355	(24,785)
Sub-grants	334,300	-	334,300
Capital Equipment	135,000	124,376	10,624
Consulting	-		-
Other Direct Costs (ODCs)	335,100	210,179	124,921
Direct Costs, Total	**1,276,277**	**573,777**	**702,500**
Indirect Costs, Gates Foundation	191,442	53,027	138,415
Gates Foundation Funding, Total	**1,467,719**	**626,804**	**840,915**

A modification in the budget is needed due to the development of the project activities. In March 2016, we sent a proposed budget modification, the same one that was approved on March 22, 2016. This modification was based on:

- Reduce Personnel category by 18%, meaning $224,659 from the initial budget. This reduction will be allocated in the Travel, Consultancy, and ODCs categories.
- Increase Travel category by 88%, meaning $132,190 from the initial budget. Since the budget in this category was under-estimated, the increase will allow the dynamic nature of the project implementation to continue in the three West African countries.
- Reduce Sub-grants category by 3%, meaning $30,000 from the initial budget. This amount was considered for NRCRI in the initial proposal to pay the consultant, Jude Njoku, since the contract was not signed. The expenses incurred by this consultant were charged directly to CIP's budget; therefore there were budget funds assigned to the Consultancy category.
- Increase other ODCs by 7% and 19% in capital equipment to purchase an additional vehicle for Ghana so that project activities can expand into the Volta Region in Ghana.

A new modification in the budget is needed for Y3 and was approved in July 2016. Decreases came from personnel, travel, sub-grants, and capital equipment. The budget increased for consulting and ODCs to facilitate project implementation in Nigeria and purchase supplies related to development of sweetpotato-processed product value chain.

Budget Category	New Budget (US$)	Expenses Y1 (US$)	Expenses Y2 (US$)	Balance (US$)	New Proposal Y3
Personnel	1,057,001	166,867	312,429	577,705	475,922
Travel	282,033	72,355	75,871	133,807	91,000
Sub-grants	943,600	-	425,905	517,695	379,855
Capital Equipment	160,806	124,376	3,563	32,867	25,000
Consulting	30,240		16,080	14,160	79,500
ODCs	1,004,581	210,179	502,545	291,857	539,870
Direct Costs, Total	**3,478,261**	**573,777**	**1,336,393**	**1,568,091**	**1,591,147**
Indirect Costs, Gates Foundation	521,739	53,027	206,983	261,728	238,672
Gates Foundation Funding, Total	**4,000,000**	**626,804**	**1,543,376**	**1,829,819**	**1,829,819**

Finally a no-cost extension was approved in order to extend some activities until May 30, 2017. In summary, the 2 additional months will be to complete endline survey collection, data aggregation, analysis, and preparation of the final report, and the potential actions that can be executed to continue the work started. That is to say, according to these modifications the final balance of the project is as follows:

Budget Category	Total Project Budget (US$)	Total Project Expenditures (US$)	Final Project Balance (US$)	Final Execution (%)
Personnel	955,219	886,957	68,262	93
Travel	239,227	252,906	(13,679)	106
Sub-grants	805,760	793,258	12,502	98
Capital Equipment	152,939	151,789	1,150	99
Consulting	95,580	93,266	2,314	98
ODCs	1,252,594	1,269,452	(16,858)	101
Direct Costs, Total	**3,501,318**	**3,447,629**	**53,690**	**98**
Indirect Costs, Gates Foundation	498,682	490,628	8,054	98
Gates Foundation Funding, Total	**4,000,000**	**3,938,257**	**61,744**	**98**

Personnel category: In the beginning of the project, the staff comprised 11 people. During Y1 this line was underspent due to a sharp decline in the value of the Ghana Cedi, and a constrained ability to adjust local salaries accordingly. During Y2 a salary adjustment was made, and the expenditures were 30% lower than forecast due to a devaluation in the local currency and some delays in hiring an M&E specialist in Ghana and Nigeria. By Y3 all the staff were complete until March 2017; then for the close-out period approved only 4 staff to stay working to complete the project activities and submit the final report. Finally, the execution of the expenses in the Personnel category with respect to the budget was 93% and represents the 23% over the total expenditures.

Travel category: In the beginning of the project the budget for this line item was incorrectly calculated and the line was overspent. A modification in to the category was approved in order to continue implementing the project in three countries in West Africa. In the next 2 years staff were traveling to contribute to the project's objectives. Finally, the execution of the expenses in the Travel category with respect to the budget was 106%; the overspend of 6% in this line was basically to support the Mid-term and Annual Report meetings in the three countries.

Sub-grants category: The partners who participate in the development of the project activities are iDE-Burkina Faso, iDE-Ghana, INERA, CSIR-SARI, Association of Church Development Projects (ACDEP), GHS, UDS Faculty of Agriculture and CSIR–CRI. The total execution in this category was 97%. All partners executed their budget correctly. Only iDE-Burkina Faso spent additional funds to support training farmers.

The execution of their budget is as follows:

Sub-grants	Total Budget (US$)	Total Expenses (US$)	Final Balance (US$)	Final Execution (%)
UDS	40,000	39,502	498	99
iDE-Burkina Faso	130,000	133,119	(3,119)	102
iDE-Ghana	210,000	210,000	-	100
INERA	185,520	185,520	-	100
CSIR-SARI	30,000	29,427	573	98
ACDEP	150,000	150,000	-	100
GHS	49,200	25,689	23,511	52
CSIR-CRI	20,000	20,000	-	100
Total	**814,720**	**793,258**	**21,462**	**97**

Capital Equipment category: In Y2 an increase in this category was approved to buy a second vehicle to allow Jumpstarting activities to expand into the Volta Region, another region of Ghana where sweetpotato is an important crop and the potential for developing OFSP value chains is high. Finally the execution of the expenses in this category with respect to the budget was 99%.

Consulting category: In the beginning of the project this category had no allocated budget. In Y2 funds were budget to this category to cover a consultancy contract for Jude Njoku. During the next 2 years the additional consultancies that were executed in this project are for a market analysis in Ghana and a market promotion in Ghana and bakery training in Ghana. Finally, the execution of the expenses in this category with respect to the budget were 98%.

ODCs category: The expenditures incurred in this category are basically to cover the computers and office furniture bought in Y1; office rent in Tamale, Ghana, operational costs to facilitate project implementation; training and workshops expenses to comply with the objective of the project; vehicles costs, and printing and communications expenses. Finally, the execution of the expenses in this category with respect to the budget was 106%. The overspend of 6% in this line item was basically to support training and to purchase the controllable assets necessary to achieve project objectives.

2. Latest Period Variance

Provide explanation for any cost category variances outside the allowable range. Explain causes, consequences for the project, and mitigation plans if relevant. Report whether or not approval for the variance has been obtained from your Program Officer.

Note: "Latest period variance" compares actuals to previous projections for the period. See "Financial Summary & Reporting" sheet in the foundation budget template for calculated variance. If you are using an older version of the budget template, this information could be in a different location in your template. Allowable variance is defined in your grant agreement.

N/A

3. Total Grant Variance

Provide explanation for any cost category variances outside the allowable range. Explain causes, consequences for the project, and mitigation plans if relevant. Report whether or not approval for the variance has been obtained from your Program Officer.

Note: "Total grant variance" compares actuals plus current projections to the budget. See "Financial Summary & Reporting" sheet in the foundation budget template for calculated variance. If you are using an older version of the budget template, this information could be in a different location in your template. Allowable variance is defined in your grant agreement.

According to the initial budget approved, the variances of each category are:

- **Personnel category**: 31%. Only 69% was executed, basically because at project end there were staff reductions.
- **Travel category**: -69%. This line was overspent, basically due to the expansion of project activities.
- **Sub-grants**: 19%. All the partners executed their budget as planned by the project team.
- **Capital Equipment**: -12%. This line was overspent, basically due to the purchase of a second car for Ghana activities.
- **Consulting:** This line item was not budgeted for in the initial (approved) budget.
- **ODCs:** -35%. This line was overspent, basically due to the workshops and training executed to meet project objectives in the 3 regions.

At the end of the project the final execution is 98%. The final balance is $61,744, largely due to the underspent in the Personnel category. At the beginning of Y3, 13 staff were working on project activities; by the end of this year, only 10 remained to work on the project. Of those, only 5 were dedicated 100% of their time to Jumpstarting activities, and the remaining 5 dedicated, on average, less than 50% of their time. During the close-out period, only 4 people were approved to work on the final progress report and to complete project activities.

4. Sub-awards (if applicable)

Use the chart to provide the name(s) of the sub-grantee(s) or subcontractor(s), actual disbursement for this reporting period, total disbursement to date from the primary grantee to sub-awardee, total spend to date by the sub-awardee and total contracted amount.

Note: The total of actual disbursements for this reporting period should equal the actual Sub-awards expenses reported on the "Financial Summary & Reporting" sheet in the foundation template for this reporting period. If you are using an older version of the budget template, this information could be in a different location in your template.

Organization Name	Actual Disbursement for this Reporting Period (US$)	Total Disbursed from Primary Awardee to Sub to Date (US$)	Total Sub-Awardee Spent to Date (US$)	Total Contracted Amount (US$)
INERA	185,520	185,520	185,520	185,520
iDE-Burkina Faso	133,119	133,119	133,119	130,000
iDE-Ghana	210,000	210,000	210,000	210,000
GHS	38,732	38,732	25,689	49,200
SARI	30,435	30,435	29,427	30,000
CSIR-CRI	20,000	20,000	20,000	20,000
UDS	39,502	39,502	39,502	40,000
ACDEP	150,000	150,000	150,000	150,000

5. Other Sources of Support (if applicable)

List and describe any sources of *in-kind* project support or resources received in the reporting period.

Note: Names of the other sources of funding and their contributions (US$) should be included in the budget template on the "Financial Summary & Reporting" sheet in the foundation budget template in the Funding Plan table. If you are using an older version of the budget template, this information could be in a different location in your template.

Describe how interest earned and/or currency gains were used to support the project.

The interest earned during the performance of the project is $1,841; it will be returned together with the remaining balance.

Privacy and Non-Confidentiality Notice

The foundation is required by the IRS to publish a list of its grants. We may also provide a general description of our grants and contracts on our web sites, in press releases, and in other marketing materials. Subject to the foundation's Privacy Policy, the foundation may also share information you provide to us (either orally or in writing) with third parties, including external reviewers, key partners and co-funders. This document is subject to the foundation's Terms of Use.

For Foundation Staff to Complete

Analysis (required if PO assessment differs from grantee/vendor assessment or if there are unexpended funds)

Progress Analysis

Include analysis of significant project variances and key learnings that may inform portfolio discussions for progress against the strategic goals.

Budget and Financial Analysis

Include analysis of unexpended funds or over expenditures. Refer to the Unexpended Grant Funds Policy for options available when recommending how to handle unexpended grant funds, or reach out to your primary contact in GCM.