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Performance Evaluation of the "Better Potato for Better Life" project
Main Report (Final)

Purchase Order: AID-663-O-14-00042

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October 24, 2014
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Acknowledgements

First and for most, I would like to express my gratitude to USAID for commissioning this study to HEDBEZ Business and Consultancy PLC and commenting on the data collection instruments and the draft evaluation report. I would also like to express my appreciations to CIP management and staff in Addis Ababa, Mekele and Hawassa for providing secondary data and facilitating the contacts with regional and *woreda* focal persons. I am also grateful to the community members who sacrificed their precious time and provided valuable information during the individual household interview and FGDs. I also extended my warm gratitude to the district sector office heads and experts, co-operative managers, CIP focal persons at regional and *woreda* levels, concerned staff of the research centers (EIAR, TARI, MARC and SARI), FAO Addis Ababa office, GOAL Ethiopia at Hawasa office and VITA at Addis Ababa and Arbaminch offices, heads of private seed producer companies (Solagrow at Bisheftu, Ezra general trading, Muluneh Boru Tuber Sebel Lemat and Wamole Sweet Potato Seed Production PLC in SNNPR, Minora Business Group PLC & YB Biotechnology Center PLC in Tigray), Mums for Mums in Tigray and Egna Leegna in SNNPR. These organizations and their staff cooperated with us and responded to our questions and showed us their demonstration or seed multiplication sites, warehouses, etc.

Without the support of all of these institutions and persons, this evaluation would not have been possible. I appreciate and earnestly thank all the institutions and individuals who directly or indirectly contributed to the successful completion of this assignment.

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Acronyms and Abbreviations

BoA	Bureau of Agriculture
BPBL	Better Potato for Better Life
CIP	International Potato Center
DAs	Development Agents
DDI	Dietary Diversity Index
DLS	Defused Light Store
EIAR	Ethiopian Institute of Agricultural Research
FAO	Food and Agriculture Organization
FCS	Food Consumption Score
FGDs	Focused Group Discussions
FGs	Farmers Groups
HARC	Hotela Agricultural Research Center
HEWs	Health Extension Workers
HHs	Households
Kg	Kilograms
Lt	Liter
MARC	Mekelle Agricultural Research Center
MfM	Mums for Mums
MFs	Model Farmers
NGOs	Non Governmental Organizations
OFSP	Orange-Fleshed Sweet Potato
PLC	Private Limited Company
PRA	Participatory Rural Appraisal
QDS	Quality Declared Seed
qt	Quintals
RARIs	Regional Agricultural Research Institutes
SARI	Southern Agricultural Research Institute
SMSs	Subject Mater Specialists
SNNPR	Southern Nations Nationalities People Region
SP	Sweet Potato
TARI	Tigray Agricultural Research Institute
USAID	United States Agency for International Development
VITA	Irish NGO

Executive Summary

Introduction: This report provides an independent assessment of Better Potato for Better Life (BPBL) project which was funded by USAID and implemented in Tigray and SNNPR by CIP and its partners: federal and regional research institutes, regional and *woreda* agriculture bureaus/offices, international and national NGOs, private sector potato and sweet potato seed multipliers and cooperatives or farmers' groups. The evaluated project was implemented from October, 2009 to March 2014 (but extended till December 2014 on some components). The main goal of the project was to enhance the livelihoods of food insecure rural farmers in SNNP and Tigray regions through diversification of cropping systems, increasing potato and sweet potato productivity and strengthening potato and sweet potato value chains. It also aimed at strengthening the national capacity to create sustainable access of poor farmers to high quality potato and sweet potato planting materials, demonstrate the potential enhancement of incomes through establishment of profitable value chains and assure that at least 250,000 target households have improved food security and diet quality.

HEDBEZ Business & Consultancy PLC is commissioned, through a competitive bid, to conduct the performance evaluation of BPBL project. This executive summary presents the synthesis of the evaluation methodology and key findings on the changes (results) brought about by the project interventions, lessons that can be scaled-up, the limitations, conclusions and recommendations.

Methodology: Both quantitative and qualitative data were collected. The data collection methods included review of project documents and reports, household survey, focus group discussion, key informants interview and observations. A total of 1,308 households (219 in Tigray and 1089 in SNNPR) were randomly selected for household survey. About 16.1% of the sample households (HHs) were female farmers and 70% were project beneficiaries while 30% were non-beneficiaries (control). A total of 343 farmers (25.1% female) and 77 persons (22.1% female) participated in the FGDs and KIIs respectively. The key findings are summarized below.

Increasing production and productivity of potato and sweet potato: The project planned to create access to clean seed for 100,000 potato growers and 150,000 Sweet Potato (SP) growers and achieved more than the target (according to CIP report). But the achievement would be 95% and 40% of the target for the respective crops if the direct project intervention in the project *kebele*s and extension program in non-project *kebele*s were considered. The project facilitated collaboration with consortium of NGOs lead by FAO to increase the number of farmers reached, but the data could not be verified by the consulting team. Moreover, the estimate for farmer to farmer seed exchange was considerably high (Annex 3, Table A3.12) though it was difficult to verify. Overall, the achievement of this ambitious target was moderately good.

The proportion of farmers producing potato and SP increased in both regions compared to the baseline whereby the number of potato growers increased by 20% and 85% in *belg* and *meher* season, respectively for the project participants; the increment for SP is more than double. Due to the effect of extension services and farmer to farmer potato and SP extension, the number of control farmers involved in the production of these crops also increased overtime. Moreover, the project participants have allocated more land to potato and sweet potato, harvested higher yield and produced more than the control farmers.

The yield of potato increased on average by about 9% compared to the baseline although this could not result in increased production due to declined area allocated to potato. However, the project beneficiaries produced more and sold more potato than the control farmers. The project contributed to an increase in productivity through (i) creating access to clean and disease free potato seed and sweet potato vines, (ii) capacity building, (iii) supervision and follow up and (iv) creating hope for market linkage. In the SNNPR, Hawasa 83 SP variety is largely grown and the project helped to restore the variety damaged by disease. Hawasa 83 variety is well accepted in SNNPR while Orange Fleshed Sweet Potato (OFSP) is accepted more in Tigray than in the SNNPR. The farmers in SNNPR used to consume varieties with sweet taste and rejected the taste of the OFSP.

Increasing income: The households generated income from different sources of which annual crop production which included potato and sweet potato, was the major source of household income for the majority of the households. The project participants earned higher (by 27%) household income and cash income (by 20%) than the control farmers. Potato contributed 37% to household income and 30% to household cash income while sweet potato contributed 10% to household income and 8% to household cash income.

Food security: The BPBL project implemented activities pertinent to enhance food availability and access. In most cases, potato was sold to purchase staple food and hence increased access to food. Potato was also consumed as main menu or relish from own production (availability) or purchased (access). In the SNNPR, potato played significant role in increasing access to food through availability relieving the pressure on *enset* which used to be harvested before maturity due to food shortage. Household food security status was assessed by measuring per capita income using a cut-off point of US$1.25 per day per adult equivalent. The household is said to be food secure if the per capita income is above Birr 8,700 per year per person and food insecure otherwise. The result shows that about 68% of the sample households were food insecure while the proportion of food insecure household was slightly higher for the control farmers (70%) than for the project participants (67%).

There was an improvement in the number of perceived food sufficiency of households. The improvement is higher for participants (4.2 months) than for control (3.2 months) which was mainly due to the project intervention. About 80% of the households in SNNPR and 52% of those in Tigary evaluated the contribution of BPBL to food security as very high while 18% and 35% of the sample households in the respective regions evaluated the contribution as medium.

Food consumption: Food Consumption Score (FCS) and Dietary Diversity Index (DDI) are the two proven and reliable proxy indicators of diet quality and quantity assessment tools across a range of settings. The findings show that about 42% of the HHs had acceptable level of household level FCS, 37% had borderline level and 21% had poor level of food consumption. HHs in Tigray had better consumption level than the HHs in SNNPR, which was consistent with income based food security status. About 53% of the children between 6 and 59 months of age had an acceptable level of food consumption and only 20.5% (21.2% of participants and 18.8% among controls) had a poor level of food consumption which was significantly different between the regions. Children aged 6-59 months had better consumption level in Tigray than their counterparts in SNNPR. There is a significant improvement in FCS in Tigary compared to the baseline.

Analysis of DDI shows that potato and sweet potato were widely consumed by both participant and control HHs in SNNPR (76.4% and 71.8% respectively). SP (especially the OFSP) was added as a new diet to household food in areas like Hawuzen (in Tigary) where the crop was newly introduced and the tendency for its acceptance was increasing. However, it received lower acceptance in SNNPR. The majority (more than 61%) of the children aged 6 to 23 months consumed potato and sweet potato, which was not significantly different between participants and control. On average, 55% of the households meet the minimum dietary diversification at HH level with higher proportion of households in Tigray than in the SNNPR. Except in the case of children of 6-23 months old, more proportion of participants meet the minimum DDI requirement than the control farmers.

Seed system: The foundation for potato seed system has been laid by the project. It is now clear that the sources of seed and research and research institutions (EIAR, TARI and SARI) have been capacitated to select, conserve and multiply potato seed and SP vines. Cooperatives, farmers groups and the private sector multiply the seeds. Holeta ARC became the sole actor of mini-tuber supply while still engaging in G-2 and G-3 production. It appears that the regional RARIs were not the major actors in basic seed multiplication, increasing pressure on Holeta ARC which has limited capacity. Moreover, cooperatives and model farmers that multiply potato seed still expect the project to provide them with basic seeds or G-2 and G-3 seeds. On the other hand, the demand side of the seed system or the seed distribution system has not been yet well established.

The project facilitated the development of national guideline for Quality Declared Seed (QDS) of potato. The sample *woreda*s started monitoring seed production in the field and certifying the seed produced. Properly defining the responsible institutions and resourcing the implementation of the QDS becomes crucial for its successful and sustainable implementation.

Market linkage and value chain: In most places, beneficiaries understood that potato seed and sweet potato vines are produced to sell to the project (e.g. sample *woreda*s in Tigray and Gumar and Geta in SNNPR); they waited for CIP to buy. In some places e.g. Misha, Lemo and Hulla *woreda*, there was the understanding that CIP facilitates market linkage in which the cooperatives found their own ways of selling the product. Hulla farmers had good linkage to traders in Shashemene and could sell the seed potato in time. Market linkage problem applies for seed system actors at different levels and is not yet fully addressed. Value chain and market linkage development for seed and outputs should be further dealt with so as to sustain the results of the project.

Project design and management: BPBL project was initiated and designed based on prevailing national and regional problems. CIP initiated the project, approached the target regions and the project ideas and activities were welcomed and supported by the two regions. Once the project was approved, the planning and implementation was done in collaboration with partners. CIP provided overall management and coordination functions. It established smooth working relationship among the implementing partners. Linkage between regional extension and potato seed multipliers is not yet strong. CIP appeared to play major role in linking research and extension and NGOs and the private sector. Communication between implementing partners, CIP and USAID has been strong, smooth and efficient.

Lessons:

i) *Partnership in project implementation:* the approach of partnering to implement project enabled reaching larger areas and a large number of beneficiaries. The regional and national review and planning forum was important for knowledge sharing, joint decisions on what to do and defining the roles and responsibilities of partners. However, relying on the regions as the major planning partner reduced the ownership at *woreda* level in the sense that the *woreda* development committee is not reviewing the BPBL project activities and thus the evaluation was based on the feedback by the focal persons.

ii) *Selection of impactful technology:* potato produces higher energy and yield per ha than cereals. Potato seed also attracts higher price generating income for HHs. This made the selection of potato as intervention crop very important. BPBL project provides good lesson for other projects to be strategic in commodity selection (economic and nutritional returns as basis for poverty reduction).

iii) *Addressing local needs by considering culture*: the project became relevant since it addressed local needs for improving the food security and livelihood of the farmers: creating access to food and dietary diversification. But introduction of OFSP varieties had not considered the consumption habit or culture.

iv) *Capacity building of partners:* Capacity building for research (researchers and research institutes), extension experts, cooperatives and selected farmers were relevant interventions which are also integrated. Provision of DLS changed the attitude of farmers that potato is perishable and cannot be stored for long to use as seed.

v) *Developing potato seed system is complex* due to the nature of chains of activities involved in potato seed multiplication resulting in different generations of seed. CIP was a major player in the seed distribution system in which it links the supply and demand centers (Holeta ARC, regional research and cooperatives and NGOs). The implication is that when the project phases out, the system may stop functioning since the role played by CIP is not taken up.

vi) *Seed production brings return several months after production*. Though income generated from such production system is remunerative, it is not the best alternative for resource poor farmers as they would suffer from transitory food insecurity.

vii) Without proper development of market and value chain, the task of seed system development is incomplete.

Limitations/Gaps/Challenges

i) *Partnership lead by focal persons (expert):* The project coordination and linkage at *woreda* level was mainly with the experts and less emphasis on decision making bodies.

ii) *Centralized activity planning at region level:* The project operational plans were made at the regional review and planning workshops. Although the *woreda* focal persons participated in the workshop, they were experts that have no authority to make key decisions.

iii) *Late involvement of cooperative office:* The support given by the office to the cooperative was low since the *Woreda* cooperative offices were engaged lately.

iv) *Delay in financial reporting:* Most CIP sub-grantees including government organizations and NGOs delayed preparation of adequate financial report and submission of corresponding documentation.

v) *Lack of operational budget:* Some operational costs such as transport, communication, M&E at *woreda* level were not backed by budget.

vi) *Weak planning of training*: The trainees trained at the same time had different backgrounds and specialization and the training duration was short. Moreover, no manuals were distributed for further references. TOT implementation was not budgeted to enable second tier training at community level.

vii) Major focuses were given to potato seed production. Potato seed marketing and distribution were not systematically approached. Ware potato production and marketing was not given due attention.

viii) CIP played crucial role to roll out the seed system by linking or buying and distributing seeds from Holeta ARC and/or cooperatives and providing them to *woreda* agriculture office for out scaling. Government staff turnover was a challenge in the project implementation.

ix) Project logframe lacks measurable targets (with exception of number of beneficiary farmers) to judge level of implementation efficiency.

Conclusion

The project activities are integrated and are synergized. Capacity building at all levels was relevant to conserve, multiply and maintain disease free potato seed. Demonstration of DLS helped to reduce loss and increase storage time for potato seed. As a result of the project, potato yield and consumption increased. Household food security has improved and dietary diversification at household level, for children and pregnant and lactating mothers improved. The household income also increased and the contribution of potato and SP was significant. The project has resulted in change in attitude towards potato seed supply system. Yet some limitations on the design of basic seed multiplication and lack of decentralized basic seed multiplication (giving more responsibility to RARIs) and lack of well developed market and value chain may constrain the sustainability. System of scheduled replacement of aging potato seeds is not in place. CIP was key player in making the seed system to operate. The project activity planning was more centralized at region level, reducing real ownership at *woreda* level. Coordination at *woreda* level is also expert centered rather than involving influential persons. Delays in reporting (especially finance) could also be related to the design. Technical experts were provided with incentives while administrative staffs not.

Recommendations

i) Assuming EIAR to be the sole source of basic seeds for all potato seed producers is infeasible due to limitations in capacity and proximity to seed producers. Hence, decentralization of seed production systems is necessary. Further capacitate HARC to increase production of potato mini-tubers and distribute to regional RARIs and focus on systematized seed replacement schedule. Enhance the capacity of RARIs to multiply basic seeds and link with private and cooperative seed multipliers. Moreover, the number of disease resistant varieties being used by the farmers is limited. Research should focus on generating alternative varieties.

ii) Finalization of the Quality Declared Seed Certification system and institutionalizing its implementation requires additional technical as well as financial support.

iii) Potato and SP value chain and market development is crucial for sustaining the development of the sector. Special interventions are needed for ware potato value chain since it requires different quality standards & storage technologies.

iv) Further intervention is needed on the Nutrition Behavior Change regarding OFSP.

v) Business skills and organizational capacities of farmers groups and cooperatives should be further strengthened.

vi) Project activity planning should be further decentralized to ensure ownership at *woreda* level. Make sure that all necessary activities are budgeted.

vii) The existing financial staff of partners is assigned to dual tasks where the regular task receives priority. Recruiting staff or remunerating extra hours of work of the administrative staff is necessary to increase efficiency.

viii) Another phase of the project is needed in the project areas for consolidation before replicating in new areas. However, the new phase should include the largely influential potato seed supplying areas in Oromia so that the concept of clean seed and QDS is meaningfully applied.

1. Introduction

1.1 Background

More than 85% of the Ethiopian population, residing in the rural area, is engaged in agricultural production as a major means of livelihood. However, the agricultural productivity is low due to use of low level of improved agricultural technologies, risks associated with weather conditions, diseases and pests, etc. Moreover, due to the ever increasing population pressure, the land holding per household is declining leading to low level of production to meet the consumption requirement of the households. Furthermore, the food grain prices have escalated and became beyond the purchasing capacity of the poor households in Ethiopia. Hence, food insecurity and poverty are still prominent challenges that need to be addressed. On the other hand, potato and sweet potato are the two underutilized crops in the country though they have high potential to significantly contribute to food security and improved nutrition. The two crops provide large quantity of dietary energy, high quality protein, vitamins, minerals, fiber and antioxidants which make them important target crops for improving nutritional status of the society. These crops also produce relatively higher yield than cereals.

In order to improve food insecurity, CIP has been implementing the USAID funded project entitled "Better Potato for Better Life" (BPBL) in Tigray and SNNP regions over the period between October, 2009 and March 2014 with a total budget of US$ 5 million to which US$ 1 million is added for the extension period (ending December 2014). The main goal of the project was to enhance the livelihoods of food insecure rural farmers in SNNP and Tigray regions through diversification of cropping systems, increasing potato and sweet potato productivity and strengthening potato and sweet potato value chains. The objectives of the project are to enhance the livelihoods of food insecure rural farmers by strengthening the national capacity to create

sustainable access of poor farmers to high quality potato and sweet potato planting materials, demonstrate the potential enhancement of incomes through establishment of at least four profitable value chains and assure that at least 250,000 target households have improved food security and diet quality (see Annex 1, sections 1.1 and 1.2 for brief description of the project). The project was implemented by CIP in collaboration with federal and regional research institutes, regional and *woreda* agriculture bureaus/offices implementation, international and national NGOs, private sector potato and sweet potato seed multipliers, and cooperatives or farmers groups (See Annex 1, section 1.3 for roles of partners).

The project implementation strategy included institutional capacity building (training, laboratory facilities at research centers, provision of supplies for seed selection and multiplication, demonstration of DLS for cooperatives and farmers groups), establishing linkages between NGOs and agencies (e.g. FAO, Africa rise, WVI, etc.) involved in emergency and development in food insecure areas and look for clean and high yielding seeds of potato and sweet potato, and seed system development (potato seed supply and distribution system; potato seed quality certification system), conducting value chain analysis and provision of business skill building training and promotion of potato and sweet potato consumption.

The evaluation of the project was planned to assess the overall performance of the project and the factors that were necessary for achievement of its objectives, the challenges faced during implementation of the project as well as lessons learnt to implement similar projects in the future.

HEDBEZ Business & Consultancy PLC is commissioned, through a competitive bid, to conduct this performance evaluation. This report is, therefore, prepared to present the details of the evaluation objectives, methodology, the findings, the changes (outcomes and impacts) brought about by the project interventions, good lessons that can be scale-up, the challenges encountered, conclusions and recommendations.

1.2 Purpose and the Objectives of the Performance Evaluation

1.2.1 Purpose of this performance evaluation

The purpose of the performance evaluation is to provide an independent judgment of the overall performance of the project. Moreover, the evaluation assesses the factors that were necessary for achievement of its objectives, the challenges faced during implementation of the project as well as lessons learnt to implement similar projects in the future.

1.2.2 Specific objectives of this performance evaluation

The specific objectives of the performance evaluation include:

a) To assess the extent to which planned results of the project have been achieved vis-å-vis the project objectives and goals;

b) Assess the effectiveness of the project's approaches towards the achievement of its objectives and key results; and

c) Establish evidence that suggests that the project activities are replicable and would produce similar results if it were tried elsewhere.

Moreover, it is expected to identify lessons learned and challenges and make clear, explicit and actionable recommendations including suggestions of options to improve the design and implementation of future similar projects.

1.3 Scope and Methodology

The scope of the evaluation is to assess the extent to which planned results/outcomes have been achieved vis-à-vis the project objectives and goal as well as assess the effectiveness of the project's approaches towards the achievement of its objectives. Moreover, it was expected that key results of the project such as productivity and marketing, household income and nutritional outcomes as well as seed security and sustainability outcomes be evaluated. Thus, in order to achieve the stated objectives, the evaluation used non-experimental design that focuses on measuring project results after project implementation and compared them with the baseline or the baseline (before the project intervention) depending on data availability. Results of project participants were compared with that of non-participants (control).

Data were collected from 11 *woreda*s in the two regions (Figure 1.1 and Annex 2 Table A1.1). Both quantitative and qualitative data were collected. The data collection methods included review of project documents and reports, household survey, focus group discussion, key informants interview and observations. A total of 1,308 households (219 in Tigray and 1089 in SNNPR) were randomly selected for household survey. About 16.1% of the sample households (HHs) were female farmers and 70% were project beneficiaries while 30% were non-beneficiaries (control). A total of 343 farmers (25.1% female) and 77 persons (22.1% female) participated in the FGDs and KIIs respectively (Table 1.1). See also Annex 2, section 2.1 for details.

Table 1.1: Sample size used for quantitative and qualitative data collection

Data source	Tigray			SNNPR			AA (all men)	Total			% female
	Male	Female	Total	Male	Female	Total		Male	Female	Total	
HH survey	194	25	219	903	186	1089		1097	211	1308	16.1
FGD-farmers	73	14	87	184	72	256		257	86	343	25.1
KII	25	4	29	54	13	67	5	84	17	77	22.1
Extension	16	3	19	32	7	39		48	10	58	17.2
Research	2	0	2	2	0	2	1	5	0	5	-
Private sector	2	0	2	4	0	4		6	0	6	-
NGOs (& FAO)	1	1	2	3	2	5	2	5	3	8	37.5
CIP	1	0	1	1	0	1	2	4	0	4	-
Cooperative	3		3	12	4	16		16	4	20	20.0
Total (All tools)	**292**	**43**	**335**	**1141**	**271**	**1412**	**5**	**1438**	**314**	**1728**	**18.2**

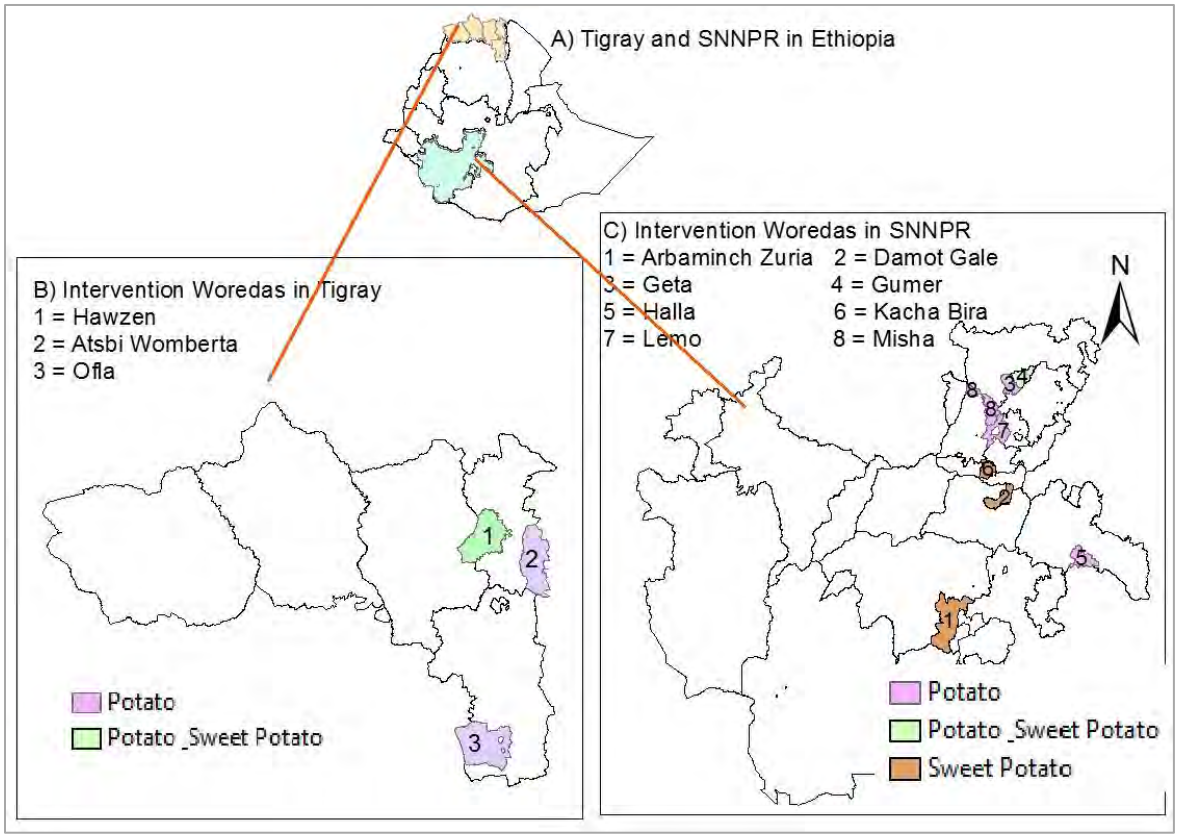

Figure 1.1: Location of study areas in the two regions

The data collection instruments include systematically designed household survey questionnaire and checklists for FGDs and KIIs. The survey questionnaire consists of seven sections: i) identification, ii) HH size and features, iii) means of the HH livelihood, iv) livestock ownership, v) institutional services, vi) food consumption and vii) food security. The questionnaire is given in Annex 2, section 2.2.1. The FGDs and KIIs were also guided by the checklists prepared to collect detailed information from all stakeholders. The FGDs checklist is given in Annex 2, section 2.2.2 while the KII checklists are given in Annex 2 section 2.2.3. List of FGD and KII participants is given in Annex 2, sections 2.3 and 2.4 respectively.

Production and income data were collected for the 2006 Ethiopian cropping season (2013 GC) while the consumption data were collected for the last 7 days and 24 hrs (from the date of the interview).

1.4 Organization of the Report

The report is organized into four parts: the main report and three annexes. This main report presents synthesis of the overview of the project, methodology and the major findings of the evaluation. It consists of few core tables and figures. Many important tables and figures are referred to in Annex 3. Some details of the project overview including its objectives and roles of partners are presented in Annex 1. The methodology is also detailed in Annex 2. The table and figure numbers in Annex 3 start with "A" to distinguish tables and figures in Annex from those in the main report.

2. Socio-economic Description of the Sample Households

2.1 Household size, sex and age composition

The average size of the sample households was 6.1 persons with about 49% female members. There is a slight difference between participants (6.2 persons) and control farmers (6.0 persons). Adult Equivalent (AE) which standardizes household members of different age and sex categories into the same unit was computed based on Storck et al. (1991)[1]. The result shows that the household size was 3.0 AE for participants of the project and 2.8 AE for the control farmers. This implies that 50.9% of the members of participant households and 55.8% of the members of the control farmers are dependent or mainly children. Mean household size of participants and control farmers by age group is given in Annex 3, Tables A3.1 and A3.2 while the average household size by age and sex is displayed in Annex 3, Figure A3.1.

2.2 Education

Education is an important element of human development. It enables easy skill and knowledge transfer and technology adoption. In the study areas, about 33% of the respondents (31% participants and 37% control) did not attend formal education. From those who reported having some education, about 1.5% attended religious education, which is especially the case in Tigray. Only 2.4% completed high school and 1.3% joined college. The majority (38%) of those who attended school did it up to 6th grade, which the average education level across the sample. The proportion of the sample respondents by education level is given in Annex 3, Table A3.3. Overall, there is no significant difference between participants and control farmers in terms of education level completed.

2.3 Religion

The respondents are heterogeneous in terms of the religious faith they follow. The majority (40%) are protestant religion followers followed by Muslim and Orthodox religion. However, regional disaggregation shows that the respondents in Tigray predominantly follow Orthodox religion while protestant religion followers were found only in the SNNPR (see Annex 3, Table A3.4 and Figure A3.2 for the details).

2.4 Ethnicity

Ethnicity can influence livelihood activities, work culture and food habits. A response to new ideas and technology may also be influenced by social and institutional factors of particular ethnic groups, and their interaction with others. In the study areas, the dominant ethnic groups differed among the regions and *woreda*s due to ethnic based administrative structure. The population in SNNPR shows more ethnic diversity where as in Tigray region all (100%) are

[1] *Storck, H., Bezabih Emana, Berhanu Adenew, A. Borowiski and Shimelis Woldehawariate (1991). Farming Systems and Farm Management Practices of Smallholders in the Hararge Highlands, Farming Systems and Resources Economics in the Tropics. Vol. 11, Wissenschaftsverlag Vauk, Kiel KG, Germany.*

Tigre ethnic group. In general, the major ethnic groups included in the sample are 38% of Gurage, about 17% Tigre and 14% Wolayita (Annex 3, Table A3.5).

2.5 Means of Livelihood

The sample households both in Tigray and SNNPR rely on diverse sources of livelihood. Based on the proportion of people living on them, crop production, livestock production and petty trade were ranked as the first, second and third most important means of livelihood (Annex 3, Figure A3.3). Livestock fattening, wage work and beekeeping also provide means of livelihood for good number of farmers. The proportion of farmers living on beekeeping was higher in Tigray than in the SNNPR. The pattern of ranking the sources of livelihood by the participant and control farmers was similar. However, relatively higher proportion of participants in Tigray generated their livelihoods from beekeeping (19%), petty trade (15%) and livestock fattening (28%) as compared to the control farmers (see Annex 3, Table A3.6). However, higher proportion of control farmers generated their livelihoods from wage work (17%) and PSNP (26%) compared to the participant farmers (11% and 10% respectively). The level of livelihood diversification was low for most of the farmers (both participants and control farmers) as only small proportion of these farmers generated their livelihood from these diverse alternatives (See Annex 3, Tables A3.6-A3.8).

2.6 Landholding and Land Use

Land is a natural factor of agricultural production. As agriculture is the major source of livelihood in the project areas, access and possession of land is a crucial resource on which the livelihoods of the population depend. The land holding and use in the study areas in 2013 revealed that the average land hold by the household was less than 1ha (0.94 ha for the participant and 0.87ha for the control farmers). The major part of the land was allocated to annual crops. That is about 0.51ha (54% of the available land) of the land owned by the participants and 0.49ha (56% of the available lands) of the land owned by the control farmers was used for annual crops. The result also shows that the average land holding in Tigray was smaller than that of SNNPR (Annex 3, Table A3.9). The proportion of irrigable land is also high for the participant farmers indicating the resource potential for participants to grow potato, SP and other vegetables.

Farmers use different mechanisms of leasing in land to offset the problem of land shortage. The result shows that 31% of the participating farmers and 17% of the control farmers in Tigray rented in land in 2013 production season, which averaged at 0.6 ha and 0.4 ha, for the respective group of farmers. The proportion of farmers that rented in land during 2013 in the SNNPR was 16% and 12% for participants and control farmers respectively. This indicates that the project beneficiaries seem to have created opportunities for augmenting productive land for crop production including potato.

The land rental value was different between the two regions averaging at Birr 7000 per ha in Tigray and Birr 3,000 per ha in SNNPR and the land value depends inversely on supply and and directly on soil fertility. Moreover, 56% of the participants and 43% of the control farmers in Tigary leased in an average of 0.4ha and 0.3ha of land, respectively, in the form of share cropping. The proportion was lower in the SNNPR (50% of participants and 36% of control farmers) with an average of 0.4ha and 0.34ha for the respective group of farmers.

2.7 Access to Institutional Services

2.7.1 Extension service

The survey result shows that the largest majority of the sample farmers i.e. about 93% (89.5% in Tigray and 93.7% in SNNPR) responded as they received extension services in crop production including advice and technical supports from different institutions. Moreover, 77% of the sample respondents stated that they received extension services in livestock production with slightly higher proportion in SNNPR (Table 2.1). The result also shows that relatively higher proportion of the project participants were served with extension service though the variation in extension services between participants and control farmers was not statistically significant.

Table 2.1: Proportion of farmers having access to extension services in different sectors (%)

	Crop production			Livestock production		
Region	Participant	Control	Total	Participant	Control	Total
Tigray	90.6	87.1	89.5	73.2	71.4	72.6
SNNPR	94.6	91.4	93.7	80.4	72.5	78.1
Total	94.0	90.6	93.0	79.3	72.3	77.2

Source: Own survey (August, 2014)

The result also shows that the only provider of extension advice on cereal crops, fruits, vegetables, sweet potato and other root crops was the government extension system. In the project *kebele*s, the institutions providing extension services on potato production are diverse compared to other crops. The *woreda* agriculture office was the key extension service provider for farmers producing potato as stated by 90% of the participants and 100% of the control farmers. BPBL project used the government agricultural extension system to disseminate potato technology. Other supporters of potato production include research (through on-farm demonstration of research experiments) and NGOs that are subcontracted to implement BPBL although the proportion of farmers indicating this source was very low. The survey result also shows that the farming practices learnt from the extension system supported by BPBL include different agronomic practices such as land preparation, proper planting, cultivation, irrigation, and harvesting. Practices such as pest and disease management and post harvest handling were mentioned by relatively fewer farmers (Annex 3, Table A3.10). The overall result shows that farmers access potato extension service on average for 4 days per month while the extension frequency for other crops averaged at 3 days per month.

2.7.2 Credit service

Smallholder farmers are often constrained by shortage of operational capital to finance crop production. About 61% of the sample respondents (74% in Tigray and 58% in SNNPR) stated that they encountered capital shortage during 2013. About 47% of them received credit equivalent to an average of Birr 2,737. The proportion of households that received credit and the loan size was larger in Tigray than in the SNNPR (Table 2.2). In both regions, relatively larger proportion of the control farmers encountered capital shortage; larger proportion of them received credit (except in Tigray) and received larger loan sizes with statically significant difference at 5% level only in Tigray (Table 2.2).

Source of credit in both regions was mainly the MFI covering 50% of the credit received by the sample households (71% in Tigray and 54% in SNNPR). Saving and credit cooperatives also provided credit to their members where about 20% of the sample farmers received credit from cooperatives (18% in Tigray and 20% in SNNPR). Individuals and neighbors provided some credit for resource poor farmers (Annex 3, Table A3.11).

Table 2.2: Proportion of farmers that do not have sufficient capital for input financing (%)

	Encountering shortage of capital			Received credit in 2013			Average loan (Birr/HH)		
Region	Participant	Control	Total	Participant	Control	Total	Participant	Control	Total
Tigray	73.2	77.1	74.4	69.4	66.7	68.5	3,943**	6,015	4,602
SNNPR	56.2	61.5	57.8	40.6	44.0	41.7	1,937	1,913	1,929
Total	59.0	64.3	60.6	46.5	49.0	47.3	2,551	3,119	2,737

*** implies statistically significant difference between participants and the control in Tigray at 5% level.*

3. Relevance of Project Components

The relevance of the project components and its design was assessed based on the review of project documents, key informants interview and FGDs conducted at different levels with different partners including the community. The project was designed to tackle food insecurity and malnutrition problems through diversification: by exploiting the potential of potato and sweet potato to reduce food insecurity and dependence on cereals in SNNP and Tigray regions. The relevance is, thus, assessed from different perspectives as follows:

i) *Addressing food insecurity*: this is coherent with the national and regional plans. The national food security program and the growth and transformation plan put food insecurity at the center upon which agricultural transformation results in growth. Addressing food insecurity problem and bringing about growth through agricultural transformation is achievable through diversification, conservation and use of improved agricultural technologies that increase yield and market development. These issues were the core objectives of the BPBL project making it highly relevant. BPBL is also consistent with *woreda* development plans. For example, in the SNNPR, it was indicated that potato is a priority extension crop and the dissemination of the new variety was accelerated.

   The KIIs and FGDs results revealed that all of the project areas (for both potato and sweet potato) had severe food insecurity problem, due to small land size and low level of agricultural technology use. Increased population pressure resulted in allocation of land for food security crops like '*Enset*'. The crop is consumed mainly during food shortage periods (May to October). However, the severity of food insecurity forced most HHs to harvest corm of immature *enset* (known as 'Amicho') to cope with food insecurity. This reduced productivity and depleted the asset bases since the households also sold their assets like livestock to access food. Thus, the project was judged as highly relevant for household level food security since potato and sweet potato were consumed at household level as main dish as well as relish. Sales of potato also increased access to food by the project beneficiaries since they sold potato and purchased different food items.

ii) *Focus special crops*: The Ethiopian research and extension systems were emphasizing on food crops such as maize, wheat, barley, teff, pulses, etc. Vegetables, roots and tuber crops were

not given the attention they deserved. The BPBL project is unique in the sense that it focused on potato and sweet potato which are critically important for household food security. Potato produces higher yield and energy per ha than cereals. On the other hand, productivity of potato grown by farmers over longer period produced lower yield and became highly susceptible to disease. The newly introduced potato varieties grow faster and mature in 3-4 months as compared to the traditional varieties enabling the participants of the project to produce more from their limited land.

Before the project, the local varieties of sweet potato were becoming extinct and farmers changed the production system to cereals and other crops. The project then revived sweet potato varieties in the agro-ecology and socio-cultural setting it was adapted to. Thus, selection of the two crops was highly relevant though OFSP variety was not accepted in the SNNPR due to taste incompatibility.

iii) *Selection of suitable implementation areas*: The agro-ecology (high-land for potato and midland for sweet potato) of the selected *woreda*s are appropriate. This enabled high adaptability of the crops to ensure sustainable maintenance of the seed at least at household level.

iv) *Need based technology selection*: lack of access to disease free potato seed and sweet potato planting materials was the entry point. Besides, Orange Flavored Sweet Potato (OFSP) was introduced to improve nutritional problem although acceptability of OFSP was low except in areas where local sweet potatoes were not common and OFSP is newly introduced (e.g. Tigray) and Hagereselam (as reported by GOAL); Awassa 83 has been well accepted in the SNNPR is widely adopted.

New technology of DLS, which considerably reduces the tuber sprout growth through the broken light ray, and the concept of seed quality control significantly, reduced post harvest loss of potato seed through prolonging the shelf-life of potato seed. The technology selection of BPBL has been marked as highly relevant.

v) *Strengthening the seed system*: The major problem with potato and sweet potato production was lack of access to disease free and high yielding planting materials. Despite a common understanding of this problem in the research and extension system, no significant attempt was made to improve the system. BPBL is unique in addressing this systemic problem. Attempts to link the different seed actors and generating knowledge of seed quality and guidance on quality declared potato seed is also judged as very relevant.

vi) *Implementing through existing system*: The BPBL planned to largely use the existing research and extension system to select, maintain, multiply and distribute potato seed and sweet potato vines. It created the capacity at Holeta, Mekele and Hawassa to enhance the selection, adaptation and multiplication of seeds. The *woreda* extension departments worked closely with CIP and its partner NGOs to distribute seeds and provision of extension service. CIP and its partner NGOs were key actors and well recognized in the project *kebele*s. The project provided some incentives for the focal persons. Though incentive is necessary, there will be some shocks when the incentives are removed.

vii) *Use of existing potential:* The project has been implemented mostly in areas where the target crops were produced. Hence, farmers had indigenous knowledge to apply to both crops in

SNNPR enabling the beneficiaries to easily adopt the newly introduced technologies and practices. It also enabled farmers to evaluate the technologies and compare the project intervention with the situation before the project. In the case of Tigray, the technologies/varieties and the practices were newly introduced in many parts of the region.

The project also attempted to exploit the existing potentials by using already established cooperatives and Farmers Group (FG) as entry points for potato seed multiplication. The exiting small scale irrigation schemes developed by the government and other agencies created good opportunity for growing both crops and had especial advantage to sustain sweet potato vines from one season to another.

viii) *Food consumption promotion:* Attempts made to promote potato and sweet potato consumption and dietary diversification was an important component since OFSP was new in the study areas. The design shows demonstration at group level and use of mass media (mainly Tigray), school clubs, demonstration, billboard, using public events, poster, etc. Although awareness has been created at higher levels (such as *woreda*, kebele administration, cooperatives), the promotion system did not penetrate to household level. There is no link between the activities of the project and that of health extension workers.

ix) *Gender dimension:* The project activities included mix of men and women in capacity building and targeting in potato and sweet potato production. At household level, both men and women play important role in potato and sweet potato production and marketing. Although BPBL has no gender specific objectives and activities, it included men and women in training programs. There is no evidence that the intervention negatively affects the gender balance.

Over all judgment of the evaluation: the project implementations of both crops were highly relevant.

4. Effectiveness in Achieving Project Objectives

Effectiveness of the project measures the extent to which the goal and the objectives of the project have been achieved. The ultimate goal of the project, as explained in the narrative project document, is to enhance the livelihoods of food insecure rural farmers in SNNPR and Tigray regions through the diversification of cropping systems, increasing potato and sweet potato productivity and strengthening potato and sweet potato value chains. To achieve this goal, four overall objectives and several specific objectives pertaining to both potato and sweet potato crops were set. Therefore, in this section, the findings of the evaluation are discussed focusing on the following: potato and sweet potato production and productivity, diversification of production by the project beneficiaries (trigger effect of increased income), income, food security and nutritional diversity of the sample farmers in the project area. Another important objective is also establishing sustainable seed system. The effectiveness of the implementation process is also discussed below.

4.1 Potato and Sweet Potato Production and Productivity

4.1.1 Potato and sweet potato growers

As discussed above, annual crop production is a dominant source of livelihood of the people in the project *woreda*s. Farmers in both regions produce crops in two seasons: *meher* (the main rainy season) in which most of the crops are produced and *belg* season. In *meher* season, farmers usually plant different types of crops from mid June to end of August and harvest from October to December depending on the type of crops. In *belg* season, there is small rain from February to mid June (mostly in the SNNPR). In Tigray, *belg* rain is so short and thus supplemented by small scale irrigation. *Belg* season crops are limited to crops like maize and vegetables due to rain inadequacy. However, some crops are planted in *belg* season and grow through the *meher* season and hence classified as *meher* crop.

The BPBL project planned to reach 100,000 potato producers and 150,000 sweet potato producers. The strategy followed was strengthening the seed system so that direct project beneficiaries get access to clean and high yielding planting materials so that they also multiply seed to sell to other farmers and pay back the amount received from the project plus 10% to the *woreda* agriculture office. This seed is used for scaling up and distributed to other farmers in the *kebele* or outside the *kebele*. Some cooperatives produce potato seed communally while others collect potato seed produced by its members on individual plots and sell it to CIP, NGOs and other farmers. Seed is distributed through three possible paths: (i) establishing or strengthening seed producing cooperatives to multiply clean and high yielding potato seed; (ii) scaling up by the extension system by distributing potato seed produced by project beneficiaries and farmer to farmer seed distribution; (iii) partnering with private sector potato seed and sweet potato vine producers and linking them with NGOs. In order to effect the 1st path, BPBL established or strengthened 7 cooperatives or farmers groups in Tigray with 355 members (16% female); and 186 cooperatives or farmers group in SNNPR with 5,057 members (34% female). The cooperatives or farmers groups were organized by the *woreda* cooperative offices through largely the initiation of the *woreda* agriculture office and also BPBL project partners such as VITA and GOAL Ethiopia which organized 12 cooperatives or farmers groups having 869 members.

The data compiled by CIP (2014) shows that 192% of the target potato farmers have been reached by the project and 246% of the target sweet potato growers (BPLP *kebele*s and non-BPLP *kebele*s (see Annex 3, Table A3.12). However, the data verified by the consulting team puts the achievement rate at 95% for potato and 40% for SP. The achievement of this objective was moderately adequate in the sense that the project attempted to establish link between private seed multipliers and cooperatives and NGOs purchasing seed to distribute to other farmers.

The survey result also shows that the proportion of farmers producing potato and sweet potato became more than double for sweet potato compared to the baseline data in *belg* and *meher* seasons with higher rate of expansion in the SNNPR than in Tigray (Table 4.1). The number of potato growers increased by 20% and 85% in *belg* and *meher* seasons for the project participants. Due to the effect of extension services and farmer to farmer potato and sweet potato extension, the number of control farmers producing these crops also increased through time.

Table 4.1: Proportion of farmers producing potato and sweet potato during *meher* and *belg* (%)

Crop	Tigray			SNNPR			Total				
	End evaluation		Baseline	End evaluation		Baseline	End evaluation		Baseline	% change	
	Participants	Control		Participants	Control		Participants	Control		Participants	Control
Meher:											
Sweet potato	16.7	18.8	-	66.7	44.4	25.0	60.7	41.4	17.0	257	144
Potato	24.2	17.1	22.0	33.5	33.7	28.0	31.3	29.4	26.0	20	13
Belg:											
Sweet potato	30.6	25.0	4.0	72.6	65.3	24.0	67.9	60.0	17.0	299	253
Potato	43.0	5.7	36.0	72.5	30.4	54.0	88.8	77.6	48.0	85	62

Source: Own survey (August, 2014)

4.1.2 Production diversification

It was envisaged that the farmers increase the production and productivity of both potato and sweet potato crops through crop diversification and efficient use of their potentials (i.e. conducive climate, indigenous knowledge and land), access to improved technologies (i.e. improved varieties, improved agronomic knowledge and practices such as land preparation, fertilizer application, pests and disease control, post harvest management, etc). BPBL introduced different potato and sweet potato varieties. The findings of the evaluation confirm that both the participants and control farmers diversified their crop production and introduction of different potato varieties directly or indirectly contributed to diversification. There were, however, variations among the farmers in terms of the intensity of production of different crops. Food crops like maize and wheat were grown by the largest proportion of farmers while high value crops such as vegetables and fruits were produced by less number of farmers. Land availability, irrigation potential, availability of operational capital and seed availability and knowledge about the production system were the major causes of variation in crop diversification and intensification. In areas such as Hawuzen where sweet potato is newly introduced, BPBL project added to diversification of crop production. In areas where potato and sweet potato were commonly grown (e.g. Wolayita) BPBL reinforced and stabilized the diversification which already existed.

Table 4.2 shows the type of potato varieties introduced during the project period and the number of farmers growing them. Though many of these varieties, especially Gudane and Jalene were in production for several years, accessing clean and disease free seed was a challenge. The largest majority of the farmers grow Gudane followed by Jalane. These two crops have reached as much as 6th generation and farmers are in urgent need for replacement seed. Belete is a new generation introduced recently and only 8.8% of the farmers reported producing it. In general, about 43% of the potato growers used at least two varieties of potato, enhancing the benefit of production diversification as different varieties have different merits. The result also shows that the objective of the target farmers (especially the cooperative members) was to produce potato seed as this attracts higher price given the project context.

Table 4.2: Potato varieties grown and purposes of growing them (%)

Variety	Seed	Ware	Both seed and Ware	N	%
Bulle	11.1	33.3	55.6	9	1.14
Jalane	5.2	65.7	29.1	344	43.43
Gudane	6.9	63.4	29.7	478	60.35
Wechacha	-	50.0	50.0	2	0.25
Guassa	-	56.5	43.5	23	2.90
Gera	75.0	20.8	4.2	24	3.03
Tocha	-	71.4	28.6	7	0.88
Local	0.6	91.0	8.5	177	22.35
Belete	32.9	45.7	21.4	70	8.84
Total	11.9	94.6	36.7	792	100.00

Source: Own survey (August 2014)

Compared to the baseline results (2010), the proportion of farmers growing different varieties of potato has increased. For example, the proportion of farmers growing Jalane increased from 13% before the project to 43% after the project while that of Gudane increased from 10% before the

project to 60% after the project. Moreover, the majority (68%) of the farmers were growing local varieties of potato before the project compared to 22% after the project. The contribution of the project to this change in cropping system is highly significant.

Regarding sweet potato, a variety called Gadisa is the most commonly grown followed by Hawassa 83 (Annex 3, Table A3.13). Gadisa is Oromiffa word means shade implying leafy sweet potato. Sweet potato varieties were diverse in the SNNPR than in Tigray, where the crop was newly introduced. Moreover, the survey team understood that the production and consumption of Orange Flavored Sweet Potato (OFSP) in Tigray was increasingly accepted while its production in the SNNPR is constrained by food habit and non-adaptability to moisture stress area where seedling survival is low during the dry season.

Multiple cropping became possible because potato was harvested in 4 months permitting planting of other crops on the same land as crop rotation was needed for pure and healthy seed production. In areas where the farmers were producing potato even before the project, the production was done on smaller area and the yield was low.

Before the project (baseline), about 79% of the sweet potato growers used Gadisa variety which is still dominant. The second popular variety was Koka 6 (grown by 4% of the farmers before the project) and Hawassa 83 after the project. It was also reported that there was no farmer producing OFSP varieties (such as Tulla and Kulfo) before the project while about 3% of the sweet potato growers reported growing OFSP.

4.1.3 Productivity of potato and sweet potato

Participants and control farmers allocated their land resources to production of different crops during *belg* and *meher* seasons (Annex 3, Table A3.14). The aggregate area allocated to potato and sweet potato (during *belg* and *meher*) shows that the participants allocated slightly larger land size to potato and sweet potato, though the difference is not statistically significant (Tables 4.3 and 4.4). This implies that the crop technology has disseminated from farmer to farmer, making the definition of control farmers difficult as there was no mechanism of preventing the control farmers from accessing the technologies by their own effort or support of other agencies.

The survey result shows that the average land allocated per household to potato and sweet potato is smaller than the baseline data and as a result, the total crop production is smaller though the yield of potato has increased by about 8.8% for the project participants during the *meher* season and by 3.6% during the *belg* season. The discrepancy between the evaluation result and the baseline could be related to sampling where it is highly likely that selection bias could occur in the baseline where well to do farmers or active farmers could be interviewed for the participants and non-participants. Moreover, the evaluation team tried to collect data at group level and for typical farms. The FGD results imply that farmers use potential yield to exemplify success of the project while still they agree that lower yields are common. The survey data reflects some challenges encountering expansion of potato: declining farm land per household, limited supply of improved crop varieties, high fertilizer price and market challenges.

The project interventions that lead to increased productivity and production for the project participants include the following:

i) Access to clean and disease free potato seed and sweet potato vines created by BPBL project for the participants. It was emphasized in the FGD and KII that compared to

traditional varieties like red potato the new variety was highly productive. It was indicated that the local variety yields a maximum of 90qt per ha where as improved varieties could produce as high as 250qt per ha. Awassa 83 variety of sweet potato is also preferred by the farmers for its adaptability, yield and disease resistance.

ii) Capacity building activities including training on agronomic practices and crop management techniques and business skill for cooperatives were very important to understand the crop business and increase productivity. Results of the FGD also indicated the existence of yield increase for the project beneficiaries and control farmers but the increase in yield was higher for the project participants due to the knowledge acquired in crop management and access to new generation of seed.

iii) Supervision and follow up by the project staff and *woreda* extension staff. The *woreda* extension staffs give more attention to project *kebele*s, DAs in the non-project *kebele*s were not trained and some of them lacked knowledge of crop husbandry in general and horticulture in particular.

iv) Encouragement for market linkage promised by the project.

Table 4.3: Area, yield and production of potato and sweet potato in *belg*

	Tigray		SNNPR		All cases		Baseline		% change	
	Participants	Control	Participants	Control	Participants	Control	Participants	Control	Participants	Control
Area (ha)* **										
Potato	0.2	0.07	0.26	0.19	0.25	0.19	0.33	0.24	-24.2	-20.8
SP	0.03	0.02	0.13	0.1	0.13	0.1	0.23	0.29	-43.5	-65.5
Yield (qt/ha)										
Potato	121	46	147	134	144	122	139	75	3.6	62.7
SP	119	101	88	71	114	87	135	86	-15.6	1.2
Production (qt)										
Potato	24	3	38	25	36	23	46	18	-21.5	28.8
SP	4	2	11	7	15	9	31	25	-52.3	-65.1

Source: Own survey (August 2014)

Note: *** implies that difference in area is significant at 1% for potato; and yield difference is significant at 1% in Tigary and insignificant in SNNPR

Table 4.4: Area, yield and production of potato and sweet potato in *meher*

	Tigray		SNNPR		All cases		Baseline		% change	
	Participants	Control	Participants	Control	Participants	Control	Participants	Control	Participants	Control
Area (ha)										
Potato	0.29	0.02	0.23	0.16	0.24	0.15	0.35	0.22	-31.73	-30.2
Sweet potato	0.02	0.00	0.11	0.13	0.11	0.12	0.2	0.2	-45.65	-38.9
Yield (qt/ha)										
Potato	127	114	110	91	111	92	102	89	**8.82**	**3.371**
Sweet potato	180	162	82	95	86	98	97	92	-11.86	6.522
Production (qt)										
Potato	23	2	21	10	22	10	36	15	-40.28	-35.3
Sweet potato	1	0	6	6	6	6	17	14	-67.53	-59.1

The lower yield of SP could be attributed to the following: (i) the major variety widely adopted is Awassa 83 which was produced in the area before it was devastated by disease (before the project; (ii) the project introduced the vines without any capacity building to improve productivity; (iii) there is a tendency that farmers put little effort to apply adequate farm management for SP as compared to efforts made for other crops. There is a tendency that farmers shifted emphasis from SP to other crops and allocate small land size to SP to produce largely for consumption.

4.1.4 Potato seed and sweet potato vine sources

Building the capacity to maintain own potato seed and sweet potato vines is one of the major objectives of the BPBL project. The proportion of farmers using own potato seed increased from 29% before the project to 64% after the project. Private seed multipliers were the major sources of potato seed where 61% of the farmers accessed seed from this source. Those accessing seed from NGOs, extension, research and CIP account for 43% and the proportion of farmers accessing potato seed from market declined after the project (Annex 3, Table A3.15).

Similarly, the project became major source of sweet potato vines, where about 72% of the farmers received through CIP and 33% of them maintained sweet potato vines (Annex 3, Table A3.16).

The different varieties of potato have been assessed in terms of different merits like yield, disease resistance, early maturity, cookability, taste, price and storability. The results show that the majority of the farmers were highly satisfied with the different varieties though Belete, Gera and Gudane rank 1 to 3 in that order (Annex 3, Table A3.17 and Figure A3.4).

The majority of potato producers stored seed potato for 4-6 months and for an average of 5 months in *meher* and 6 months in *belg* (Annex 3, Table A3.18). Although some farmers reported longer period of ware potato storage, it is not applied for larger quantity as potato can be stored only ideally for a maximum of three months.

4.2 Sales of Potato and Sweet Potato

In both the project regions, crops were produced for two major purposes: consumption and income generation. Some crops were produced more for consumption while others were produced for sales. For example, in Tigray, 94.5% of vegetables were produced in *meher* season was sold. Similarly spices, oil crops and potato were largely produced for market. In both regions, sweet potato, legumes, teff, wheat, and barley were produced for consumption as well as sales (Annex 3, Tables A3.19 & A3.20).

As shown in Tables 4.5 & 4.6, the largest proportion of potato is produced for sales. Many farmers who produced seed potato have stored at cooperative DLS or household level DLS to sell it in the future. In this case, the project participants benefited more since they produced larger quantity than the control farmers who produce less and sell less. In both cases, potato is used for consumption, own seed as well as for livestock feed (low grade and small size potato).
In both regions, the project participants produced much more quantity of potato and sweet potato and soled the largest proportion of quantity produced in *belg* and *meher* (Table 4.6).

Table 4.5: Potato and sweet potato produced and sold by region (qt)

No.	Crop	Tigray						SNNPR					
		Participant			Control			Participant			Control		
		Produced	Sold	% sold	Produced	Sold	% sold	Produced	Sold	% sold	Produced	Sold	% sold
1	*Potato*												
	Belg	16.9	9.5	56.3	2.9	2.4	80.9	27.9	3.7	13.2	16.7	1.4	8.7
	Meher	22.7	13.2	58.4	2.2	1.9	86.0	21.2	10.2	48.2	9.8	1.6	16.2
2	*Sweet potato*												
	Belg	2.4	1.8	71.9	1.3	0.3	22.0	7.4	1.4	19.0	5.2	0.7	13.4
	Meher	1.1	-		0.2	-	-	5.4	0.9	16.5	5.7	1.6	28.0

Source: Own survey (August 2014)

Table 4.6: Potato and sweet potato produced and sold for total sample (qt)

No.	Crop	Participant			Control			Difference		
		Produced	Sold	% sold	Produced	Sold	% sold	Produced	Sold	% sold
1	*Potato*									
	Belg	26.6	4.3	16.3	16.4	1.5	8.9	10.2	2.8	27.5
	Meher	21.5	10.8	50.2	9.6	1.6	16.7	11.9	9.2	77.3
	Total in a year	*48.1*	*15.1*	*31.4*	*26*	*3.1*	*11.9*	22.1	12	54.3
2	*Sweet potato*									
	Belg	7.2	1.4	19.8	5	0.7	13.5	2.2	0.7	31.8
	Meher	5.3	0.9	16.4	5.4	1.5	27.9	-0.1	-0.6	600.0
	Total in a year	*12.5*	*2.3*	*18.4*	*10.4*	*2.2*	*21.2*	2.1	0.1	4.8

Source: Own survey (August 2014)

4.3 Contribution of Potato and Sweet Potato to Household Income

The household generated income from different sources: annual crop production, perennial crops, livestock and livestock products and other livelihood sources which included beekeeping, petty trade, food and beverage processing, remittances, and other sources listed in Annex 3, Table A3.8). The analysis of the household income shows that in all cases, male farmers earned more income than female farmers and in all cases project participants earned more income than the control farmers during 2013 (Annex 3, Table A3:21). Moreover, annual crop production, which included potato and sweet potato, was the major source of household income for the majority of households. Livestock was the second important source of income (Annex 3, Table A3.22) and major source of cash income of the household (Annex 3, Table A3.23).

The contribution of potato and sweet potato to household income and cash income of participants of the projects and control farmers was significant. Results displayed in Table 4.7 show that participant farmers earned, on average, more than double income and cash from potato production as compared to the control farmers. This difference is the major cause of differences in total household income and cash income.

The findings of the FGD also shows that income of cooperatives increased due to increased yield, high price of potato seed and reduced post harvest loss which is attributed to DLS. Sweet potato was produced for consumption and sales and the sales included leaves for livestock and also vines as planting materials. Farmers that had small scale or micro-irrigation could conserve the vines or material stocks during the dry season and made good income from SP even on small area. Leaf, vine and tuber of sweet potato was used for livestock feed; this was a major advantage.

Table 4.7: Mean income of participants and control farmers (Birr/HH)

Variable	Tigray			SNNPR			Total		
	Participants	Control	% difference	Participants	Control	% difference	Participants	Control	% difference
Potato:									
Income	21357	6694	219.0	9235	5113	80.6	10839	5158	110.1
Cash income	10686	1137	840.1	4929	2232	120.8	6139	2160	184.3
Sweet potato:									
Income	1349	983	37.3	1939	1200	61.5	1906	1189	60.4
Cash income	2875	1025	180.5	1069	715	49.5	1142	732	56.1
Total income of the household	38186	23354	63.5	22690	19147	18.5	25236	19894	26.9
Total cash income of the household	21489	13320	61.3	13839	12453	11.1	15091	12607	19.7

The survey result shows that potato was a major source of cash income of the household contributing on average 30% of the household cash income. It is the most important cash crop contributing on average 73% to the annual crops cash income (Table 4.8).

Table 4.8: Contribution of potato and sweet potato to income

	Tigay		SNNPR		Total sample		
Source of income	Participant	Control	Participant	Control	Participant	Control	Total
Potato (%):							
household income	41	22	37	35	37	35	37
household cash income	35	22	30	27	31	27	30
annual crop income	57	38	60	58	60	57	59
annual crop cash income	69	79	74	72	73	72	73
Sweet potato (%):							
household income	5	7	12	8	11	8	10
household cash income	11	2	9	6	9	6	8
annual crop income	5	8	20	17	19	17	19
annual crop cash income	21	29	28	27	28	27	28

Source: Own survey (August 2014)

Overall, the contribution of potato to household income and cash income was rated very high for potato and moderate for sweet potato.

4.4 Food Security Status

Literature identifies three major pillars of food security: availability, access and utilization. Food availability is ensured through increased food production while access is ensured either through food production (availability) or increased income to purchase required food (access). Food utilization is reducing wastage and increasing food consumption efficiency.

The BPBL project activities were pertinent to food availability and access. In most cases, potato was sold to purchase staple food and hence increased access to food. Potato was also consumed as main menu or relish from own production (availability) or purchased (access). In the SNNPR, potato played major role in the form of increased access to food through availability relieving the pressure on *enset* which used to be harvested immature due to food shortage.

Household food security status was assessed by measuring per capita income using a cut-off point of US$1.25 per day per adult equivalent. The process involves computing household income and dividing it by the adult equivalent[2] per household. Thus, a household is said to be food secure if the per capita income is above Birr 8,700 per year and food insecure otherwise. The result shows that about 68% of the sample households were food insecure while the proportion of food insecure household was slightly higher for the control farmers (70%) compared to the project participants (67%). As shown in Table 4.9, there was significant difference in the proportion of food insecure households in Tigray and SNNPR.

Table 4.9: Food security status based on per capita income (% of HHs)

Region	Food security status	Participant	Control	Total
Tigray	Food insecure	47.0	52.9	48.9
	Food secure	53.0	47.1	51.1
	N	149	70	219
SNNP	Food insecure	70.5	73.9	71.5
	Food secure	29.5	26.1	28.5
	N	763	326	1089
Total	Food insecure	66.7	70.2	67.7
	Food secure	33.3	29.8	32.3
	Total	912	396	1308

Source: Own survey (August 2014)
Note: Cut-point: $1.25 per AE per day (8700 Birr per AE per year)

There was variation among the households in terms of computed as well as perceived food security. The variation exists between regions as well as between participants and control farmers. The results of the perceived food security status shows that farmers in the SNNPR were pessimistic about their food security status (Annex 3, Tables A3.24 and A3.25) since the majority of them perceive to be able to feed their family for 12 months (after the project) while the computed per capita income shows that the majority were not able to generate income necessary to acquire the minimum required food (Table 4.10). In general, there was an improvement in the number of perceived food sufficiency of households with higher improvement for participants (4.2 months) than for control (3.2 months) which was mainly due to the project intervention.

Table 4.10: Average number of months of food security

	Before project			After project			Change		
Region	Participant	Control	Total	Participant	Control	Total	Participant	Control	Total
Tigray	6.9	7.0	7.0	9.5	8.2	9.1	2.6	1.2	2.1
SNNPR	6.9	7.4	7.0	11.4	11.0	11.2	4.5	3.6	4.3
Total	6.9	7.3	7.0	11.1	10.5	11.0	4.2	3.2	4.0

Source: Own survey (August 2014)

Households faced food insecurity during different months of the year. As shown in Annex 3, Figure A3.5, the pattern of food gap was different in Tigray and SNNPR where the majority of

[2] *Adult Equivalent (AE) standardizes household size into a single value based on conversion factor established as food consumption requirement which depends on age and sex of individual members (Storck et al., 1991).*

the farmers in the SNNPR faced food insecurity during April-May while peak food gap occurred in July-August in Tigray.

The project participants also evaluated the extent to which the BPBL project contributed to their food security. About 80% of the households in SNNPR and 52% of those in Tigary evaluated the contribution as very high while 18% and 35% of the sample households in the respective regions evaluated the contribution as medium (Figure 4.1). The major reasons for such improvement in food security were:

- The project introduced disease free planting materials, yield increased and the potato seed producers sold at good prices to CIP and NGOs;
- Production could be diversified - income was also used for purchase of fertilizer and improved varieties of other crops for food production;
- The FGD result also indicated that some farmers purchased oxen or pump for irrigation and enabled increased production of other crops;
- Sweet potato can be stored in soil for piece by piece harvesting to make it available for consumption over longer period of up to 4 months;
- Potato was harvested at period of slack cereal supply period making food available (when grain stock was depleted and before maize matured especially in SNNPR).

The overall rating of the contribution of the project to improving food security was very high for potato in the SNNPR and some *woreda*s of Tigray while the contribution of sweet potato was moderate in both regions as farmers have alternative crops of high market value and food value. SP was grown on small land size as supplementary food or for risk management.

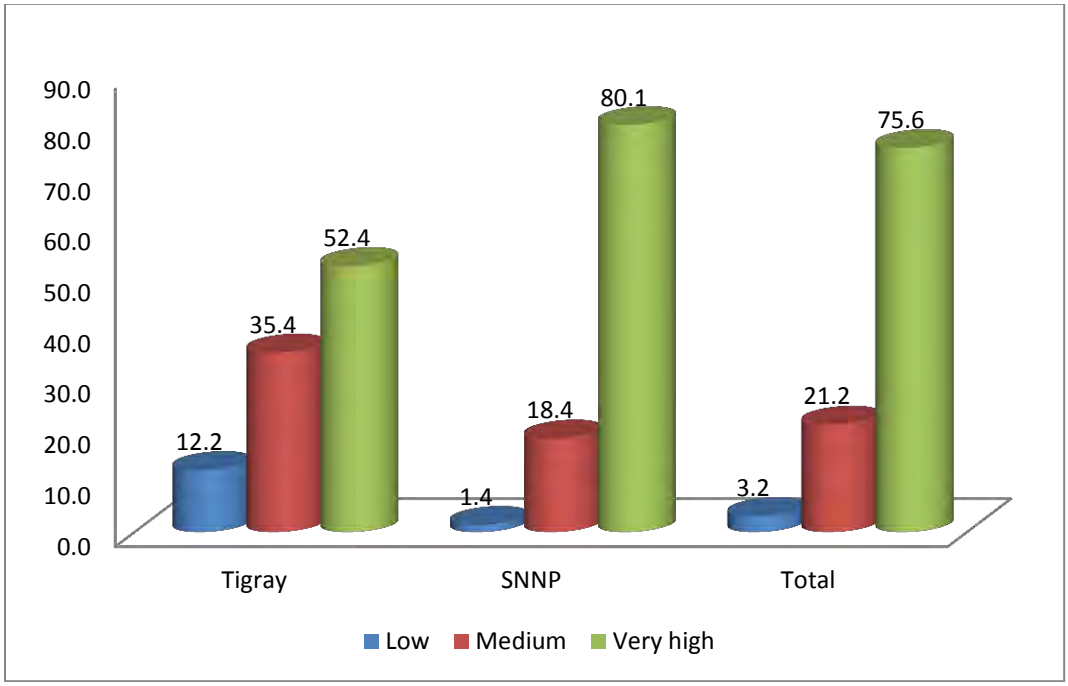

Figure 4.1: Evaluation of contribution of BPBL to HH food security (%)

4.5 Food Consumption and Dietary Diversity

Household food access, in the context of food security, is defined as the ability to acquire sufficient quality and quantity of food to meet all household members' nutritional requirements for productive live. Food Consumption Score (FCS) and the Dietary Diversity Index (DDI) are the two proven and reliable proxy indicators of diet quality and quantity assessment tools across a range of settings[3]. FCS and DDI indicators were used to assess the effectiveness of BPBL project and the results are presented in details as follows:

4.5.1 Food consumption

Along with the introduction of new varieties of sweet potato and potato in the project areas, nutrition promotion was done by MfM in Tigray and Egna-Legna in SNNPR. The promotion enabled demonstration of different menus prepared from OFSP. In Tigray the promotion included radio broadcasting which had impact at regional scale bringing a significant attitudinal change of the community. As a result, there has been a growing tendency of acceptance of OFSP for consumption. But the acceptance of OFSP in SNNPR *woreda*s visited by the evaluation team was low though the project implementation report emphasized the relevance and use of OFSP. The community says: "*Dinichin dinich, Duban dubbaa bilen inibila*" which is an Amharic expression of a total deviation of taste of sweet potato from what is customarily known to them and hence suggesting a different naming. VITA also promoted sweet potato at public gathering forum during different events like farmers' days although the level of operation was low.

Food Consumption Score (FCS) was used to measure the food consumption level at the HH level, children and pregnant/lactating women. FCS is one of the preferable indices to measure a composite score based on dietary diversity, food frequency, and relative nutritional importance of different food groups. The required data were collected from the survey respondents. The data included the frequency of consumption (in days) over a recall period of the past 7 days by grouping different kinds of food items commonly into 7 food groups (namely, 1. cereals and tubers, 2. pulses, 3. vegetables, 4. fruits, 5. meat and fish, 6. milk, and 7. oils and fats)[4]. The consumption frequency of each food group was multiplied by an assigned weight that was based on its nutrient content. The sum of these values generated the FCS and used to describe the household and children aged between 6 to 59 months by each food groups listed in Annex 3, Tables A3.26 and A3.27). Finally, the sample HHs were grouped into three standard groups based on their scores: poor food consumption (scored 0 to 21), borderline food consumption (scored 21.5 to 35) and acceptable food consumption (scored >35)[5].

The findings show that about 42% of the sample HHs had acceptable level of household level FCS, 37% had borderline level and 21% had poor level of food consumption. HHs in Tigray had better consumption level (68% had acceptable level of consumption) than the HHs in SNNPR (Table 4.11). This finding also shows existence of no significant difference between participants and controls in terms of HH food consumption levels in both regions. This might be due to continued effort by the government to increase production and income of smallholder farmers.

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[3] *Arimond et al. (2008); Ruel (2002) and Wiesmann et al. (2006).*

[4] *Used a cluster of 7 food categories – as per WHO classification*

5 *Interagency Workshop Report WFP – FAO, Measures of Food Consumption - Harmonizing Methodologies, Rome, 9 - 10 April 2008.*

Table 4.11: Proportion of households by FCS at HH level (%)

	Tigray						SNNPR					
	Participant		Control		Total		Participant		Control		Total	
Food consumption group of HHs	Evalu*	Base*	Evalu*	Base*	Evalu*	Base*	Evalu*	Base*	Evalu*	Base*	Evalu*	Base*
Poor food consumption (FCS= 0 to 21)	5.4	35.3	4.3	28.1	5	33.8	24.3	24.1	23.4	17.1	24.1	22.5
Borderline food consumption (FCS= 21.5 to 35)	27	19	27.1	18.8	27.1	18.9	38.3	24.1	42.2	25.7	39.4	24.5
Acceptable food consumption (FCS>35)	67.6	45.7	68.6	53.1	67.9	47.3	37.4	51.7	34.5	57.1	36.5	53

* Evalu=Evaluation result; Base= Baseline result

Source: Own survey (August 2014)

Moreover, 53% of the children between 6 and 59 months of age had an acceptable level of food consumption and only 20.5% (21.2% of participants and 18.8% among controls) had a poor level of food consumption, which was only slightly different between participant and control groups in both regions. Children (aged 6-59 months) in Tigray had better consumption level (about 77% getting acceptable level) than the children (aged 6-59 months) in SNNPR (only about 46% had acceptable level). When compared to the baseline findings; in Tigray region, there was a significant improvement from 47.3% (baseline value) to 76.9% (evaluation value) where as in SNNPR, the proportion of households that had acceptable level of consumption for children (6-59 months) declined from 53% (baseline value) to 46% (evaluation value). On the other hand, as the baseline result indicated, children in the control *kebele*s had more acceptable level of consumption than the participants in both regions (Table 4.12). The descriptive statistics of FCS at HH level and for children aged 6-59 months are given in Annex 3, Tables A3.28 and A3.29 respectively.

Table 4.12: Proportion of households by FCS for children 6-59 months (%)

Food consumption group of children 6-59	Tigray			SNNPR			Total sample		
	Participant	Control	Total	Participant	Control	Total	Participant	Control	Total
Poor food consumption (FCS= 0 to 21)	7.1	2.8	5.8	25.2	23.9	24.8	21.2	18.8	20.5
Borderline food consumption (FCS= 21.5 to 35)	17.6	16.7	17.4	28.1	31.9	29.2	25.8	28.2	26.5
Acceptable food consumption (FCS>35)	75.3	80.6	76.9	46.7	44.2	46.0	53.0	53.0	53.0

Source: Own survey (August 2014)

4.5.2 Dietary diversification

Dietary diversity was used as a proxy indicator of access to food (at household level), intake of energy and macronutrients and micronutrients. It is a key element of high quality diet which implies that "*increasing dietary diversity helps ensure adequate intake of essential nutrients*". The results of the evaluation show that food consumption was diverse for both project participants and control farmers indicating lack of or existence of only slight change in the consumption pattern (Annex 3, Table A3.30). Although the proportion of households that consume potato or sweet potato was not much different, the FGD participants confirmed that consumption of potato by the project participants increased after the project. The result also confirms that potato and sweet potato were widely consumed by both participant and control HHs in SNNPR (76.4% and 71.8% respectively), which was consistent with the findings of the FGDs. On the other hand, sweet potato (especially the OFSP) was added as a new diet to

household food in areas like Hawuzen (in Tigray) where the crop was newly introduced and the tendency for its acceptance was increasing. It is also apparent that the income generated can increase consumption of nutritious food like meat, milk, sugar, etc. enabling households to diversify food consumption. The results of FGDs also show that the meal frequency increased after the project due to the impact of the project on food security. Overall, the contribution of potato to household consumption diversification was very high while that of sweet potato was moderate since in many areas, sweet potato had been part of the diet and in most cases (especially in the SNNPR), OFSP was not adopted.

Similar procedures were employed to know the diversification of food consumed by children aged 6 to 23 months and pregnant and/or lactating women. Accordingly, in both regions, the majority of the children (more than 75%) consumed cereals/grains (maize, maize porridge, rice, sorghum, millet, pasta, bread, *enset,* etc) followed by oil, fat and butter (about 59.2%) and beef, goat, poultry, etc. (about 58.7%). Potato and sweet potato was consumed by many children especially in SNNPR (by about 61%; no difference between participants and control), as shown in Annex 3 (Table A3.31).

Like that of the children of 6-23 months of age, about 75% of pregnant/lactating women consumed cereals/grains (maize, maize porridge, rice, sorghum, millet pasta, bread, *enset*, etc.) followed by oil, fat and butter (about 66.1%) but more proportion of pregnant/lactating women consumed vegetables and leaves than the children. Potato and sweet potato were consumed by many pregnant/lactating women (58.2%). The result also indicates that relatively higher proportion of pregnant/lactating women in the control group consumed potato and sweet potato than the participants in both regions (Annex 3, Table A3.32).

The overall DDI reveals that, on average, 55% of the households met the minimum dietary diversification at HH level with higher proportion of households in Tigray than in the SNNPR (Table 4.13). Similar results were also found for lactating and pregnant women. Except in the case of children of 6-23 months old, more proportion of participants met the minimum DDI requirement than the control cases. The comparison of the evaluation result with the baseline shows a significant improvement in meeting the minimum dietary diversity in Tigray at household level, lactating and pregnant women and children while the result shows no improvement in the SNNPR. This might be due to the difference in nutrition promotion intervention in the two regions.

Table 4.13: Average DDI and HHs, children and pregnant/lactating women meeting minimum dietary requirement

Index	Tigray				SNNPR				Total sample		
	Participants		Control		Participants		Control		Participants	Control	Total
	Current	Baseline	Current	Baseline	Current	Baseline	Current	Baseline			
Household level:	(N=143)	(N=69)	(N=68)	(N=31)	(N=755)	(N=255)	(N=319)	(N=81)	(N=898)	(N=387)	(N=1285)
Average Dietary Diversity Index (DDI)	3.91	5.42	3.81	5.45	3.72	6.31	3.66	6.3	3.75	3.68	3.73
Meet the minimum diversity (%)	69.2	36.3	60.3	51.3	53.8	71.4	51.7	68.6	56.2	53.2	55.3
Children 6-23 months of age:	(N=42)	(N=15)	(N=7)	(N=4)	(N=113)	(N=17)	(N=42)	(N=13)	(N=155)	(N=49)	(N=204)
Average Dietary Diversity Index (DDI)	4	4.3	4	4.3	3.31	4.5	3.62	4.8	3.5	3.67	3.54
Meet the minimum diversity (%)	62.9	37.5	83.3	30.7	44.2	53.1	50	86.7	48.9	54.2	50.3
Pregnant or lactating women:	(N=48)		(N=18)		(N=180)		(N=76)		(N=228)	(N=94)	(N=322)
Average Dietary Diversity Index (DDI)	3.6		3.56		3.73		3.78		3.71	3.73	3.71
Meet the minimum diversity (%)	61.4		44.4		54.6		58.5		56	55.4	55.9

Source: Own survey (August 2014)

4.6 Seed Security and Sustainability

One of the objectives of the project was to create access to improved potato seed for 100,000 potato growers and create access to sweet potato planting material (including OFSP varieties) for 150,000 farmers. To achieve these ambitious targets, the project envisaged to establish effective seed system as discussed below.

4.6.1 Potato seed system

As illustrated in Figure 2.6, CIP imported and distributed the initial planting materials (in-vitro plantlets) to the seed multipliers such as research centers (EIAR/Holeta research center and TARI/Mekelle Agricultural Research Center) and private seed multipliers. The project also provided basic facilities such as aeroponic and hydroponic facilities and laboratory consumables. This initial step was crucial to overcome the critical problems of the research system and served as an entry point for BPBL. By using these plantlets, Holeta Agricultural Research Center (HARC) produced mini-tubers (basic seeds: 1st generation seed weighing 5-10 grams) in aeroponic and hydroponic environments. According to the KII results, the process needed great care and required long time to get quality basic seeds, which were then multiplied under green house condition to produce Generation 2 (G-2) and on field level (research environment) to produce Generation 3 (G-3). Starting year 2012-13, G1 was provided by HARC to the farmers through CIP for seed multiplication. Farmers multiply G2 and G3.

During the first 2 years of the project, CIP purchased the seed (G-3) from the seed multipliers and distributed to the *Woreda* Agriculture Offices for further distribution to the cooperatives and farmers groups. In some areas like Sidama zone, GOAL Ethiopia accomplished the task of seed distribution (Figure 4.2). The *woreda*s distributed the seed to some selected (potential) cooperatives on revolving seed modality where farmers repaid the 4th generation of potato at 1.1% rate. The collected G-4 potato was then distributed to selected cooperatives and model farmers to produce generation 5 (G-5) which was collected and distributed to other farmers. This modality enabled the project *woreda*s to scale out potato seed distribution within their district and reached many farmers especially in the SNNPR.

Moreover, G-4 and G-5 potato seeds passed from one cooperative to another cooperative and from cooperatives to individual farmers creating conditions for farmer to farmer seed distribution. It was also stated by the KII participants that regional research institutions and some cooperatives and *woreda* Agriculture Offices started multiplying basic seeds of potato but at a very low scale. Hence, the role of regional research and private seed multipliers has grown especially in the multiplication of G-2 and G-3. Among the private seed multipliers, Solagrow PLC has huge capacity to multiply up to 100,000 potato tubers though it is constrained by lack of effective demand as farmers are not willing or not able to pay for potato seed based on yield potential.

So far the seed system has given attention to how the different generations of potato seeds is multiplied but less attention on how it can be sustainably be distributed and the seed replacement mechanism after certain generation of seed is aged. It has been already reported that Guwasa and Jalane varieties became susceptible to disease and became low yielders after 6th generation and hence put out of production. Most of the farmers' currently grow Gudene variety which will be the next to be out from the seed channel since it is aging. Luckily, a new variety called 'Belete',

has been introduced and most of the farmers have shown interest for this variety as it has the highest yield and is disease free.

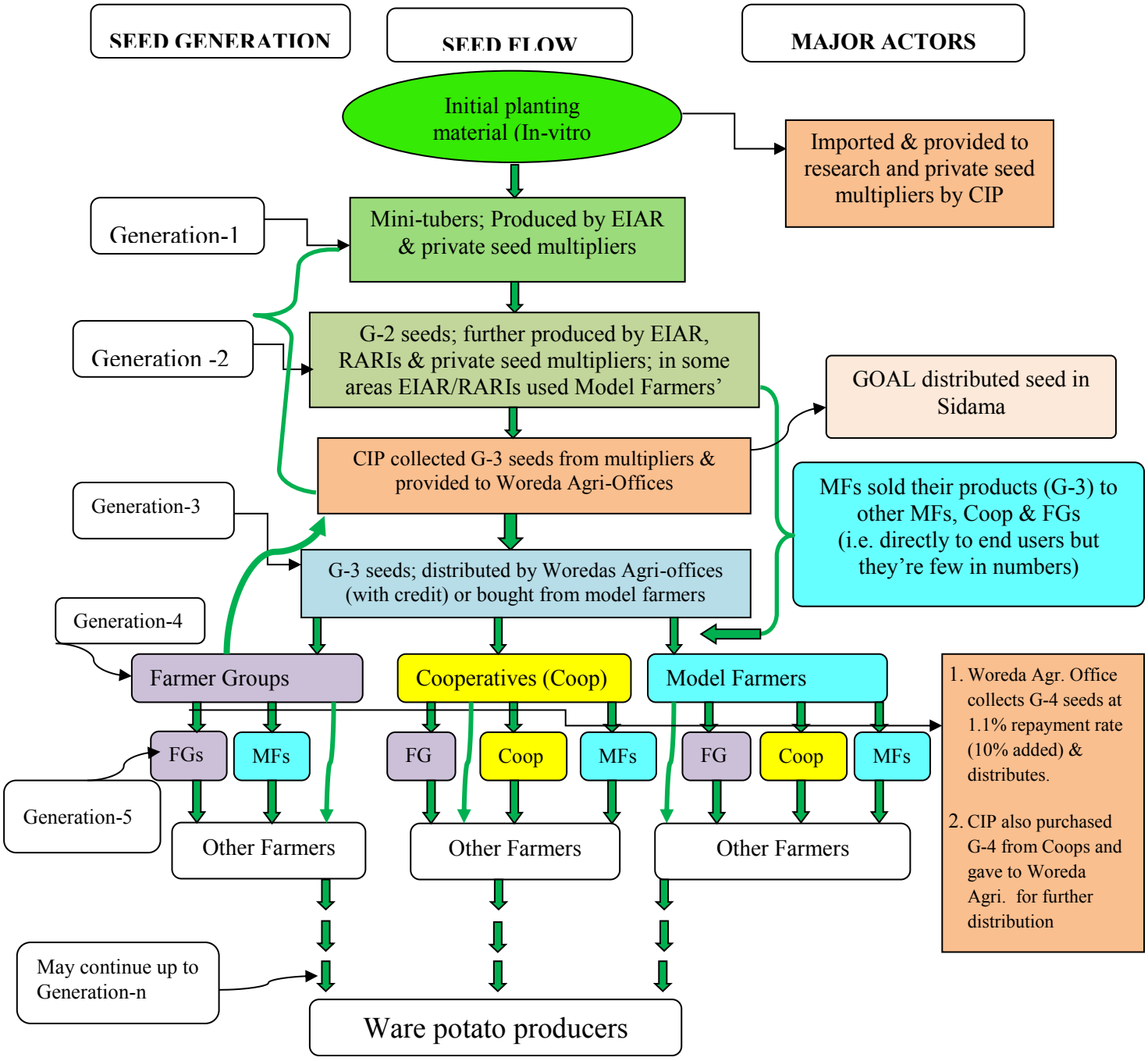

Figure 4.2: Illustration of potato seed system
Source: Sketch based on KII and review of project reports

Seed Quality Control: The project played significant role to develop manual for quality assured seed of potato. The process was participatory where the extension experts, researchers and farmers monitor the seed production field at different stages of the plant growth and determine if

the seed qualifies by meeting a set of minimum standards. Seed production plots were inspected; seeds were sorted into seed and non-seed (too large, too small and damaged potatoes were sorted out. Some cooperatives were good in maintaining seed quality. Individual farmers also state that they can maintain seed quality, based on lessons learned from cooperatives. It is a significant step in maintaining seed quality. Seed producers were largely capacitated to ensure seed quality though in some cooperatives, this capacity is still low.

4.6.2 Sweet potato seed system

Like that of potato seed system, the initial planting material (in-vitro plantlets) of Sweet Potato (SP) was provided by BPBL to the seed system using the research and private sector as entry points (i.e. TARI, SARI and to private seed multipliers). These organizations produced the 1st generation of vines (P1) and distributed to the selected project *woreda*s by CIP/VITA. The *Woreda* Agriculture Offices distributed the vines to selected farmer's groups (FGs) and Model Farmers (MFs) who had the potential to multiply P2 vines relatively in a larger quantity and willing to distribute P3 vines to other FGs, MFs and other farmers (Figure 4.3). According to the FGDs findings, SP was new in Tigray but in SNNPR some local SP varieties were grown for a long time as food security crop and consumed when other food types are scarce. Unfortunately, since 2009/2010, drought and disease destroyed SP and farmers stopped production due to lack of planting materials (vines). This project had significant contribution to revive SP production in the area. However, its coverage and distribution were not as much as it was intended since the introduced varieties of SP; especially the OFSP varieties such as Tulla and Kulfo were not drought tolerant and consequently destroyed. Even its products were not accepted by many people due to its uncommon taste. Instead, Awassa 83 variety was widely accepted due to its high yield, customary taste and adapted to moisture stress environment.

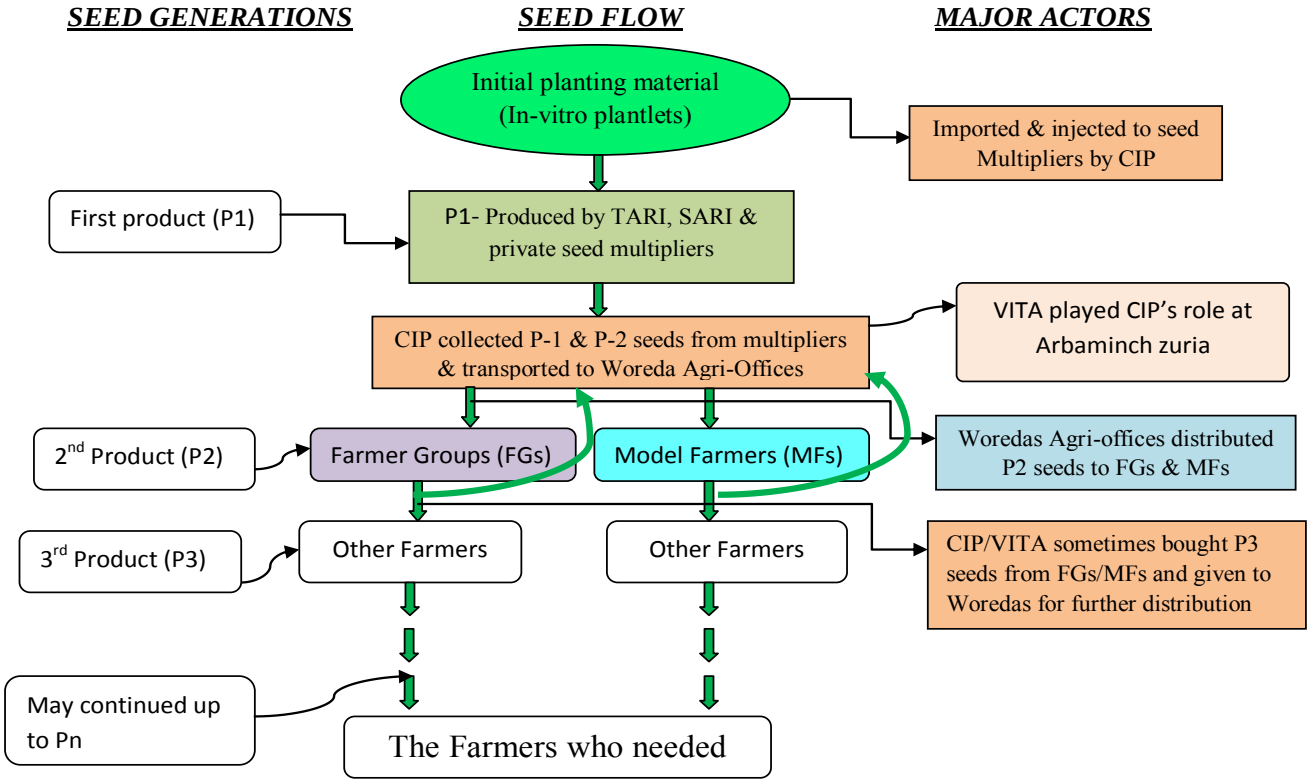

Figure 4.3: Illustration of sweet potato seed system

4.6.3 Factors of sustainability

The following issues have considerable influence on the seed system sustainability.

i) The demand side of seed system has not been yet developed. Not all the seed actors along the seed value chain have been playing role in the seed system. To introduce the system, CIP became key player in potato seed system by buying the seeds from cooperatives and distributing it to *woreda* agriculture offices. When CIP stopped buying the seed, the system appeared like collapsing due to lack of market. In general, success of potato seed business depends on market linkage. Strong cooperatives that have marketing capability succeeded compared to those which depended on CIP. For example, cooperatives at Gummer and Geta *woreda*s incurred significant losses due to lack of market. In Hadya, producers sold potato through their cooperative union and benefited. In Sidama, farmers had market access through Shashemene. In Atsbi (Tigray) seed producers at Felegeweini *kebele* operated through their cooperative which had strong management to sell their produces. In other areas, market failure resulted in discouraging results.

ii) Similarly, the demand for SP vine has been mainly from NGOs like CIP, VITA, FAO, WV, Concern, CRS, etc. But the demand was not regular and stable making the vine multiplication business unreliable. For instance, Solagrow PLC (as per the KIIs conducted with the company manager) had the potential to allocate 20,000ha land and produce sufficient quantity of vines within a short period but it has experienced irregular multiplication as determined by demand. FAO submitted request to Solagrow PLC and Minora Business Group PLC but this demand is not regular.

iii) Focus has been given to introducing and multiplying varieties rather than systems of replacing aging varieties. When Jalane is put out of the system, there was no sufficient new variety for replacement. Gudane is also aging creating worry to the seed producers. Ware potato producers may not be aware of the aging of potato seeds.

iv) Linkage between the seed system actors was not well established in the sense that every actor gets insufficient quantities of the required seed of each generation. HARC became the sole producer of mini-tuber while still engaging in G-2 and G-3 production. Moreover, cooperatives and model farmers that multiply potato seed still expect the project to provide them with mini-tubers or basic seeds. This is a result of putting the regional actors like RARIs and extension at loose position in the seed system.

v) Another contribution of the project to improved and sustainable potato seed system is the development of national guideline for Quality Declared Seed (QDS) of Potato. The sample *woreda*s started monitoring seed production in the field and certifying the seed produced as quality. BPBL facilitated the development of the guideline and its review at region level with the aim to have a national review of the document to produce a nationally acceptable document. Properly defining the responsible institutions and resourcing the implementation of the QDS becomes crucial for its implementation and sustainability.

4.6.4 Capacity building interventions

The project carried out series of capacity building activities for federal and regional research institutions, regional and *woreda* agricultural extension and farmers cooperatives and farmers groups. HARC benefited through staff training, aeroponic and hydroponic infrastructure development, green houses, tissue culture laboratory and supply of laboratory consumables. The research center used the capacity for potato mini-tuber and basic seed multiplication to supply to RARIs and *woreda*s. It also provided training of trainers for the project implementers in Tigray and SNNPR. TARI and SARI also benefited from tissue culture and green house facilities, supply of laboratory consumables and training provided by BPBL.

The Subject Matter Specialists (SMS), Development Agents (DAs) and cooperative leaders were trained on agronomic practices, crop protection; maintenance of healthy potato seed, inspection of quality seed production and business management (i.e. business planning, financing and auditing). The project focal persons were the most frequently trained staff so as to also technically backstop or train others. Farmers are also oriented on different topics (not formally trained) and technically supported by DAs and the project staff. Farmers benefited more from field days and mass education. The practices the farmers learned from BPBL and their proportion is given in Table 4.14. Overall, the data summarized from project reports show that a total of 32,548 persons (22% female) were trained by the project (Annex 3, Table A3.33).

Another significant capacity building activity implemented at cooperative and individual farmer's level was construction of Diffused Light Store (DLS) for potato. The project supported construction of 863 DLS through provision of technical support and purchased industrial goods for the construction. The project also hired technicians while labour and local materials were provided by the community (for cooperative level DLS) and individual farmers (for household level DLS). Construction and proper utilization of DLS were new knowledge introduced by this project where the project demonstrated the construction and also provided technical support. But it was observed that some of the DLS constructed at different visited sites were of poor quality:

constructed without stronger foundation or cement pavements which made them less durable (2-3 years life). Though DAs were trained, some of the DAs lacked background of crop or vegetables science and hardly grasped the training to assist farmers. Moreover, turnover of DAs is high requiring for continued training for government staff or just focus more on farmers who are stable in the area and less subject to displacement.

Table 4.14: Farmers that have learned farming practices from the BPBL project (%)

Practices learned	Tigray (N= 71)		SNNPR (N=461)		Total sample (N=532)	
	N	*%*	*N*	*%*	*N*	*%*
Land preparation	63	88.7	431	93.5	494	92.9
Seed rate/planting	60	84.5	450	97.6	510	95.9
Harvesting time/method	50	70.4	328	71.1	378	71.1
Cultivation and weeding	49	69.0	379	82.2	428	80.5
Irrigation	39	54.9	88	19.1	127	23.9
Pest and disease management	20	28.2	134	29.1	154	28.9
Storage management		-	2	0.4	2	0.4
Chemical fertilizer application			9	2.0	9	1.7

Source: Own survey (August, 2014)

4.7 Market Linkage and Value chain

4.7.1 Market linkage

Market for seed and ware potato is the most crucial factor for the sustainability of the project results. There were differences in understanding of how the project supports market linkage. In most places, beneficiaries knew that potato seed and sweet potato vines were produced to sell to the project (e.g. sample *woreda*s in Tigray and Gumar and Geta in SNNPR); they waited for CIP to buy. In some places e.g. Lemo, Misha and Hulla *woreda*s, there was the understanding that CIP facilitates market linkage in which the cooperatives followed their own ways of selling the product. Hulla farmers had good linkage with traders in Shashemene and could sell the seed potato in time. BPBL project also attempted to link cooperatives and private seed multipliers to NGOs for the purchase of potato seed and sweet potato vines. However, such linkages provided temporary solution and often not sustainable.

Market linkage problem was applied for seed system actors at different levels and was a crucial problem not fully addressed. Currently traders and consumers were the major buyers of potato in the project areas (Table 4.15). Hence, market linkage should give special attention to the private sector development.

Table 4.15: Proportion of farmers selling potato to different buyers (%)

Buyer	Tigray	SNNPR	Total sample
Traders	42.7	52.5	51.4
Fellow farmers	6.1	18.4	17.1
Union/coops	31.7	18.6	20.0
Consumers	18.3	43.5	40.7
Institutions (e.g. university, hotel)	-	10.6	9.5
NGOs	6.1	0.7	1.3
CIP	14.6	5.8	6.8
Others	-	0.3	0.3
N	82	667	749

4.7.2 Value chain development

BPBL project planned to develop four value chains on potato and sweet potato. The project conducted assessment of potato value chain and carried out awareness raising on the concepts of value chain. However, value chain development requires much more activities and facilitation work to bring about change in attitude of the value chain actors and make the relationship between actors more collaborative. According to the information collected from Solagrow PLC, farmers usually preferred cheaper potato seed varieties though the maturity period is longer and the yield is lower. This implies that the agri-business dimension of potato is not yet deepened. It is also reflection of poor value chain development since farmers are not paid well and there is no value addition business done for potato and sweet potato even if produced. As the seed system improves, it should be expected that the production booms; calling for high emphasis for motivating value addition business in the sector.

5. Project Design and Implementation Efficiency

5.1 Design and Management

BPBL project was initiated and designed based on the prevailing national and regional problems. CIP initiated the project, approached the target regions and the project ideas and activities were welcomed and supported by the two regions. Once the project was approved, the planning and implementation was done in collaboration with partners, which included EARI, regional research institutes (TARI and SARI), regional and *woreda* agriculture and rural development offices, NGOs, private seed multipliers and the community. It was the role of CIP to provide overall management and coordination functions from its Ethiopia office in Addis Ababa and regional offices in Mekelle and Hawassa. It established smooth working relationship among the implementing partners. Linkage between regional extension and potato seed multipliers was not strong. CIP appeared to play major role in establishing the linkage between seed multipliers and buyers such as NGOs. Communication between implementing partners and CIP, and USAID has been strong, smooth and efficient.

During the project period under evaluation, there were technical & operational linkages between research institutes (EIAR/HARC, TARI/MARC and SARI) to CIP at both regional and head quarter levels. These linkages were important to address the root causes of problems associated with poor quality and unreliable potato seed system. There was a strong partnership between

regional research institutes and bureaus of agriculture. There was also a direct linkage between CIP regional coordinators and regional extension units, *woreda* offices and cooperatives/groups.

Annual plans were prepared by the implementing partners and discussed at a national project review forum. The review forum was a major means of monitoring and evaluation of the project activities where the implementation of activities of the past year was evaluated and consensus on plans of the following year was reached. The regional focal persons prepared annual activity plan, managed the activity fund and coordinated the implementation of the activities at *woreda* level. The regional and *woreda* focal persons participated in the national forum. It was indicated by all *woreda*s that the regional planning process was not decentralized and the role of the *woreda*s in defining the activities for the project was low since the regional focal person/bureau of agriculture had a leading role in the planning process. Once the plans were approved, the regional bureau of agriculture was responsible for approving expenses for project activity implemented at the target *woreda*s. There was no *woreda* level project steering committee and the BPBL activities were not routinely evaluated by the *woreda* development committee. The project involved incentives for regional coordinators, *woreda* focal persons and DAs during the production seasons. These incentives were managed by CIP and some DAs reported as the payments were usually delayed. It appears that the delays were associated with administrative burden on the regional finance staff to reach all *woreda*s at the time expected by the facilitators. The partner NGOs used their own staff for project financial management and found it demanding to follow the strict financial rules of the USAID implying the need for assigning dedicated staff for the purpose.

5.2 Targeting Efficiency

Target *woreda*s and households were selected considering the following criteria:

- Potential and suitability of *woreda* for potato and sweet potato production was the first step in targeting;
- Farmers that had land, irrigation (in Tigray) and willing to participate;
- Farmers who were already organized into cooperatives or groups for seed multiplication;
- Some support was provided to women to join the seed producers group: paying membership fees.

The project targeting strategies were: (i) directly providing project inputs to cooperatives (project *kebeles*); (ii) supply of seed produced in the project *kebele*s to farmers in non-project *kebele*s (through extension system-out scaling) and (iii) linking seed producers to buyers like NGOs that buy seed and supply to farmers outside the project *woreda*s. The project implementing partners could influence targeting in the first strategy where the project targeted about 16,000 potato growers (21% female) and 22,000 sweet potato growers (15% female).

Training targets were researchers and technicians in biotechnology and tissue culture, extension experts, DAs and cooperative leaders. Nutrition education addressed wider community through media, schools, meetings, etc. But the nutrition education is not aligned with project activities at household level.

5.3 Achieving Project Outputs

i) ***Introduction of improved varieties of potato and sweet potato:*** BPBL project widened distribution of clean potato varieties, which were already in production but suffering from disease infestation especially bacterial wilt. Moreover, it has cleaned up in vitro 4 varieties of SP and conserved 23 varieties of SP.

ii) ***DLS constructions*:** BPBL constructed a total of 863 DLS (788 in SNNPR and 75 in Tigray) which have a storage capacity of 5,812 tones. Some of the DLSs were constructed by covering all costs while in some cases, the project covered cost of industrial goods and costs of technicians though not in all *woreda*s (e.g. Geta in SNNPR). The use of local material was appreciated as an indicator of efficiency. However, quality of work (especially weak foundation) made the DLS less durable. For example, one of the DLS at Ruba Felege *kebele* collapsed due to poor construction and termite. Despite such incidences, introduction of DLS was one of the cornerstones of the project intervention creating hope for sustainable potato seed supply.

iii) ***Trainings:*** According to the FGDs and KIIs findings, the project trained DAs, *woreda* experts, cooperative managers, selected model farmers, and women groups on some selected topics such as agronomy, potato seed and SP vines production, including fertilizer application, disease and pest control, post harvest management and DLS construction, business development and management at cooperative's level, and seed quality inspection techniques. A total of 32,548 persons (male= 25,414 and female= 7,131) were trained by the project on different topics (see Annex 3, Table A3.33 for details). All of these topics are very relevant and can contribute to the achievement of the project objectives. Human capacity building was also approached through experience sharing and workshops. Review of the project report shows that 2,847 persons (24% female) participated in such events (Annex 3, Table A3.34).

However, *most* of the trainings were given as TOT for 1 to 3 days which was apparently short to grasp the knowledge and skill through adequate observation, practice or role plays. Moreover, trainings were given for people of different background at the same time and the level of absorption was different. For instance, DAs trained on NRM, livestock and crops were trained together with crop specialists. Surely, the understanding and application among these trainees differ. As an approach the TOT also did not properly work down at grassroots level due lack of resources (including planning and time) for implementation.

iv) ***Seed system development:*** As discussed in section 4.6, the project attempted to introduce disease free and high yielding varieties of potato and sweet potato (including vitamin A rich OFSP). The project is efficient in terms of motivating and capacitating seed multiplication and seed quality control as well as changing the mindset of those actors of seed system. The demand size and market development (both for seed and ware potato) will be an area requiring further engagement to sustain the system.

6. Sustainability and Replicability

6.1 Sustainability

Project impact/outcomes sustainability depends on technological, institutional, economic, environmental and social factors (Figure 6.1). Institutional factors involve ownership of the project, policies and systems that govern research, extension, linkages, etc. while technical or technological factors include merits of the seed technology in terms of adaptation, relevance, affordability to acquire the technologies and ability to apply. Economic factors are more of market, value addition, price and financial factors such as the ability to buy inputs while social factors are related customs and traditions affecting consumption. Environmental factors determine how damaging or friendly the technology is to the environment. In the case of BPBL project, there is no signal of environmental concern and hence not dealt with here.

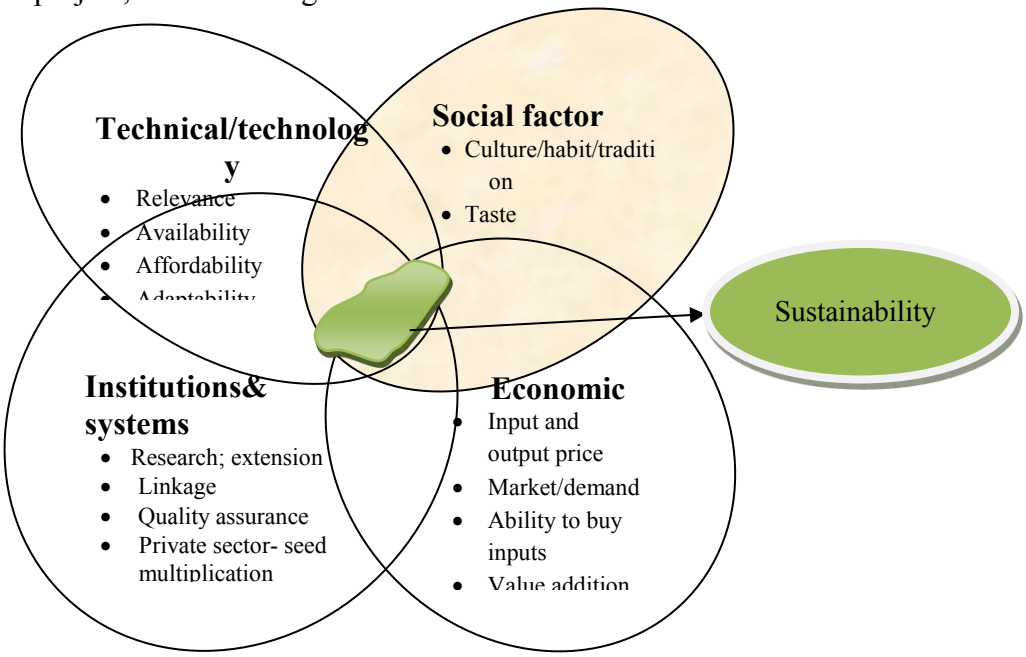

Figure 6.1: Factors of sustainability

The findings of FGDs and KIIs conducted at all levels of the evaluation processes revealed that there are a number of evidences showing potential for sustainability of the project results provided some limitations identified in this evaluation are addressed.

Technological factors: these include the knowledge, skill and easiness of the technology introduced to manage, use, expand and replicate. Potato and sweet potatoes have been produced in the project areas and the farmers had indigenous knowledge to produce these crops. In addition, the project provided training to build the technical capacity of the research, extension, farmers groups or cooperatives and model farmers. It is highly likely that the project results will be sustainable as far as technical dimension is concerned. Some key evidences are:

- Potato and sweet potato varieties, DLS and capacity building interventions have been evaluated relevant, adapted to the context and addressed needs and problems of communities and institutions.

- Potato and SP expanded to non-project *kebele*s and *woreda*s through farmer to farmer seed transfer as well as extension.
- Knowledge and skill of researchers and tissue culture technicians enhanced. Moreover, knowledge and skill of DAs, SMS (focal persons) and cooperative leaders built on potato seed multiplication and post-harvest management. If effective demand is created, private seed multipliers are capable to multiply large quantity of potato seed and SP vines.
- The knowledge and skills created to construct and use DLS enabled farmers to store seed potato for longer time (5 to 8 months) without much quality deterioration. But some of the constructed DLSs might not be durable due to weak foundation and poor construction quality. In case of ware potato perishability due to lack of proper storage facility is still a challenge. Addressing these issues add to sustainability.

Institutions and systems: Institutional capacity to select potato and sweet potato planting materials, conserve, multiply mini-tubers and basic seed has been built by the project at HARC, TARI and SARI. The project strengthened the capacity of HARC to produce clean high yielding potato seed in terms of facilities like germ plasma banks, basic seed multiplication facilities (tissue culture, hydroponic and airoponics, green houses, and lab facilities) technical skill building for the staff and providing consumables for lab, etc. The capacity created at TARI (MARC) and SARI also enables them to conserve and multiply seeds and conduct adaptation trials.

Replacement of aged varieties is becoming critical factor for sustainability. System of scheduled supply of basic seeds to replace old varieties has not been in place, as for example, Guwasa and Jalene are becoming out of production and research is focusing on new varieties than renewing these varieties. Moreover, there is no reliable system for seed multipliers to access basic seeds as HARC is the sole source of the seed and accessing the seed from Holeta will be challenging for seed multipliers located at distant. It is also important to rationalize the use of existing capacity at the research centers. HARC also has limited capacity to meet the growing demand. For example, HARC has the capacity to supply about 5,000 – 10,000 mini-tubers per year whereas Solagrow, a private company, can supply more than 100,000 mini-tubers per year. Hence, provision of clean seed will be more sustainable when there is a stronger collaboration between EIAR and the regional research institutions in such a way that EIAR focuses on mini-tubers production while the basic seeds multiplication should be further decentralized and multiplied by regional research institutions. Cooperatives and private seed multipliers should focus on generation 3 by accessing basic seeds from the nearest research center. The regional RARIs should also link with the private seed producers to increase the synergy of their collaboration.

The attempt to implement system of Quality Declared Seed is essential element of sustainability of the seed supply system. The extension system currently focuses on seed production without much attention given to its demand side. Thus, the task of input and output marketing institutions becomes determinant for sustainability of the seed system. This part is weak at the moment.

An important institution in the seed multiplication system is cooperative. BPBL project used the existing cooperatives as entry point and focused on their technical constraints of potato seed production. Prevailing cooperative management capacity problems (financial, marketing, planning, business management, etc.) were not adequately addressed. Moreover, cooperative

leadership is based on elected members working on voluntary basis which may not be sustainable when the potato business expands and demands more time from the farmers to manage cooperative as this creates conflict of interest between cooperative business and own farm business (in labour allocation) since the labor allocated for cooperative management is not adequately compensated.

Economic factors: seed and ware potato market is crucial element constraining sustainability. BPBL became instrumental in seed purchasing from cooperatives during the first 2 years of the project. Although CIP recognized that buying seeds from cooperatives was not a sustainable approach, alternative market linkage was not systematically worked out. The *woreda* extension system did not systematically plan seed production and many seed producers entered into the sector without knowing where to sell, other than to CIP. CIP linked some seed producers to NGOs involved in food security projects. The private sector also sold potato and SP vines to NGOs but the demand was not reliable and significant. For example, Solagrow, a private potato and SP seed multiplier has the capacity to produce sufficient seed at its 5 sites: Haro, Bokoji, Bahir Dar, Woliso and Tigray though market linkage and lack of effective demand limited the supply. Farmers tend to choose cheaper seeds though there was information about the yield difference. Thus, farmers' knowledge of economics of seed business should be enhanced.

Social factor: potato was accepted in all target areas for consumption and sales. However, OFSP was not accepted in SNNPR for consumption due to a difference in taste from traditional SP. In Tigray where the product was newly introduced and MfM made considerable promotion, OFSP was accepted for consumption mainly in urban areas and more work is needed in rural areas.

6.2 Replicability

Replication of project results is observed in two ways. Firstly the *woreda* agriculture offices have recognized and started giving emphasis to potato extension. In SNNPR, the evaluation team understood that potato production has expanded into non project *kebele*s. Cooperatives pressing to engage in potato seed multiplication "to be like BPLP beneficiaries". However, this momentum may cool down unless the marketing problem is addressed.

Turnover of DAs was high. The indirect benefit of this event is that the transferred DAs working in the non-project *kebele*s play crucial role in knowledge transfer to replicate the use of potato and sweet potato technologies.

The beneficiary farmers also transfer knowledge and skills to the new entrants (non-beneficiaries) through informal means like social gatherings, visits, etc. These are clear evidences suggesting that the project activities are replicable and would produce similar results if it were tried elsewhere in other *woreda*s or regions.

7. Lessons Learned

The major lessons that could be drawn from the project implementation are the following:

i) *Partnership in project implementation:* although the project report indicate that establishing partnership and making it operational required intensive resources and resulted in delay in project implementation, the approach of partnering to implement project enables reaching larger areas and beneficiaries. The regional and national review and planning forum was important for knowledge sharing, joint decisions on what to do and defining the

roles and responsibilities of partners. However, relying on regions as the major planning unit reduced the ownership at *woreda* level in the sense that the *woreda* development committee was not reviewing the BPBL project activities except getting feedback by the focal persons. Since the government and NGOs used pooled resources to prepare financial reports and partly also due to lack of incentives for the administrative staff, reports were delayed. It is important to balance the role of technical and administrative staff and provide fair incentive system. It should be fairly clear that without the incentive system (no matter if it is big or small), the technical success may not be as much as reported.

Collaboration with private seed multipliers could be a sustainable way of supplying seed.

ii) *Selection of impactful technology:* potato produces higher energy and yield per ha of land than cereals. Potato seed also attracts higher unit price than cereals. This made the selection of potato as intervention crop very important. Moreover, SP is a food security crop which grows in moisture stress areas. Moreover, introducing OFSP (in suitable environment) diversifies the household nutrition especially for lactating and pregnant mothers and children. Thus, BPBL project provides a good lesson for other projects to be strategic in commodity selection (economic and nutritional returns as basis for poverty reduction).

iii) *Addressing local needs considering also culture*: the project became relevant since it addressed local needs for improving the food security and livelihood of the farmers: creating access to food and dietary diversification has the following lessons:

- ☞ As population increases and land size declines, agricultural development through high yield, high nutrition and high value crop is a better alternative.
- ☞ Culture and taste plays crucial role in adoption of crop for consumption (e.g. rejection of OFSP in the SNNPR was attributed to its taste).

iv) *Capacity building of partners:* the capacity building interventions in the research system addressed the existing research gaps and enhanced variety conservation and multiplication. Focusing on material and human resources of the research system motivated researchers to engage more on variety verification and use of biotechnology techniques for planting materials multiplication. At cooperative and farmers' level, knowledge of potato production, grading/sorting and storage increased. Provision of DLS changed the attitude of farmers that potato is perishable and cannot be stored for long. Hence, integrated capacity building for cooperatives, individual and group of farmers, and extension and research system was important to bring about meaningful outcomes.

Capacity building for cooperatives as an organization focused on technical issues of potato production, post harvest handling and business planning concepts. Only few of the cooperatives have managers and the management capacity of cooperative leaders is limited (in most cases). Also the management time is not adequately compensated. Thus, it is likely that the potato seed producers suffer from lack of sustainability unless remunerated management that is capable to run the business is employed. In this case, the management committee may serve as a board while the routine activities are managed by employed staff.

v) *Developing potato seed system is complex* due to the nature chains of activities involved in potato seed multiplication resulting in different generations of seed. The project being implemented relied on HARC to provide not only mini-tubers but also basic seed which are

further distributed to those multiplying generations 3 and 4 of potato seeds. CIP was a major player in the seed distribution system by linking the supply and demand centers (Holeta, regional research and cooperatives and NGOs). CIP used to purchase planting materials from cooperatives and provide to *woreda* agriculture offices to distribute to cooperatives and farmers groups. The implication is that when the project phases out, the system stops functioning since the role played by CIP has not been taken up by real beneficiaries. Thus, future projects should simulate real model and provide the support need for the model to function.

vi) *Seed production brings return several months after production*. Though income generated from potato seed production is remunerative, it is not the best alternative for resource poor farmers as they would suffer from transitory food insecurity. Some model farmers who started to diversify income also wish to remain liquid to run small businesses. Hence, income generation through potato seed production should be accompanied with other means of diversifying income (for the poor) and access to credit for those intended to remain liquid.

vii) Market and value chain development is crucial element of agricultural development process and to make the project results sustainable. Thus, the task of seed system development is incomplete since the demand side is not yet addressed.

8. Limitations/Gaps/Challenges

i) *Partnership lead by focal persons:* The project coordination and linkages at *woreda* level were mainly with the focal persons and less emphasis was given to decision making bodies. The findings indicate that the heads of institutions and the *Woreda* Steering or Development Committee who are politically important at *woreda* level and should be at the center of the implementation to give support for the project was not much involved. In some *woreda*s, the project activities were not integrated into the *woreda* plans except in some *woreda*s like Arbaminch where the projects implemented by VITA were reviewed by the *woreda* development committee (but BPBL activities were not separately known). Hence, the activities were not routinely monitored and evaluated like other projects by the steering or development committee.

ii) *Centralized activity planning at region level:* The project operational plans were made at the regional review and planning workshops. The *woreda* focal persons participated in the workshop with the aim to get input from the *woreda*s. However, experts are not decision makers and passed the regional decisions to the *woreda*s.

iii) *Late involvement of cooperative office:* Although cooperatives and farmers group are main farmers organizations for potato seed multiplication, the *Woreda* cooperative offices were engaged lately. Thus, the support given by the office to the cooperative was low. But business skill and cooperative management training was given in 2013/2014 and it attempted to overcome this limitation.

iv) *Delay in financial reporting:* One of the challenges reported by CIP was that most sub-grantees including government organizations and NGOs delay preparation of adequate finance reports and submission of corresponding documentation. As discussed above, the

reasons could be overburdening of admin staff by other tasks, lack of incentive for administrative staffs/overtime work, and delay in audit by *woreda* offices (in case of VITA).

v) *Lack of operational budget:* Some operational costs such as transport, communication, M&E at *woreda* level were not backed by budget creating burden on the focal persons. The project provided some incentives for the focal persons at different levels. But the mechanism to continue the tasks performed by the focal persons after the project phases out has not been built in. Experiences show that when incentives terminate with the project phasing out, the tasks also cease to function.

vi) *Weak planning of training*: The training provided by the project had the following limitations: trainees trained at the same time had different backgrounds and specialization and the training duration was short. Moreover, no manuals were distributed for further reference. TOT implementation was not budgeted to enable second tier training.

vii) *Major focuses were given to potato seed production*. Potato seed marketing and distribution was not well systematized. Ware potato production and marketing was not given due attention. This might be due to limited interventions done in strengthening and consolidation of seed and ware potato value chains. Moreover, market development and linkages were not sufficiently done.

viii) CIP played crucial role to roll out the seed system by linking or buying and distributing seeds from HARC and/or cooperatives and providing them to *woreda* agriculture office for distribution and some time directly to cooperatives. Moreover, the cooperatives relied much on CIP for seed supply and selling of their potato seed, which affects sustainability.

ix) Government staff turnover was a challenge in the project implementation.

x) Project logframe lacks measurable targets (except the target for potato and SP growers) to compare achievements with plans and judge implementation efficiency.

9. Conclusions and Recommendations

9.1 Conclusions

The BPBL project implemented activities relevant to address critical problems of the community in Tigray and SNNPR. The project activities were integrated and were synergized. Capacity building at all levels was relevant to conserve and multiply improved seed (research), seed multiplication and management (cooperatives and farmers), extension service (DAs and SMS). Demonstration of DLS helped to reduce post harvest loss and increased storage time for potato seed. As a result of the project, potato yield and consumption increased. The project beneficiaries produced more and sold more potato than the control farmers. It also resulted in improved food security and dietary diversification at household level, for children and pregnant and lactating mothers. The household income also increased and contribution of potato and SP was significant.

The project has brought about change in attitude towards potato seed supply system. The project motivated the research and extension system to take potato and SP as essential commodities and initiated seed system development and its quality assurance mechanism. The idea of partnering potato and SP value chain actors is crucial. Yet some limitations on the design of basic seed

multiplication and lack of much decentralized basic seed multiplication (giving more responsibility to RARIs) and lack of well developed market and value chain may challenge the sustainability. System of scheduled replacement of aging potato seeds was not in place. CIP was key player in making the seed system to operate. BPBL is also acknowledged for initiating and facilitating potato seed quality declaration and certification procedure though it is still informal and the process to make it formal is not yet completed.

The project activity planning is more centralized at region level that reduced real sense of ownership at *woreda* level. Coordination at *woreda* level is also expert centered rather than involving influential persons. Delays in reporting (especial finance) could also be related to the design. Technical experts are compensated/incentivized while administrative staffs not.

Therefore, the results obtained through the project should be consolidated and identified limitations or gaps should be filled with a follow up project. The following recommendations are suggested for future interventions.

9.2 Recommendations

i) Assuming EIAR to be the sole source of basic seeds for all potato seed producers is infeasible due to limitations in capacity and proximity to seed producers. Hence, enhance decentralization of seed production systems is necessary. Further capacitate HARC to increase production of potato mini-tubers and distribute to regional RARIs and focus on systematized seed replacement schedule. Enhance the capacity of RARIs to multiply basic seeds and link with private and cooperative seed multipliers. Moreover, the number of disease resistant varieties being used by the farmers is limited. Research should focus on generating alternative varieties.

   Cooperatives, FGs or Model Farmers that multiply disease-free seed should be linked with regional RARIs to access new generation of seed and to agricultural inputs and output marketing department and the private sector for marketing. The seed system cannot be complete and sustainable until the seed distribution system is adequately established.

ii) Finalization of the Quality Declared Seed Certification system and institutionalizing its implementation requires additional technical as well as financial support.

iii) Potato and SP value chain and market development is crucial for sustaining the development of the sector. Special interventions are needed for ware potato value chain since it requires different quality standards & storage technologies.

iv) Further intervention is needed to bring about change in OFSP consumption behavior. Though OFSP is appreciated for its vitamin A, the taste is rejected by farmers in the SNNPR. Hence, alternative interventions with more influential instruments and innovative approach to change the consumers' behavior should be attempted.

v) Business skills and organizational capacities of farmer groups and cooperatives should be further strengthened. Cooperatives lack capacity to manage finance, make business planning and make marketing decisions. It is important to understand critical gaps in cooperative management and support them to overcome the problems in a sustainable manner.

vi) Project activity planning should be further decentralized to ensure ownership at *woreda* level. Make sure that all necessary activities are budgeted.

vii) Although integrating project implementation such as financial management into government system is said to increase responsibility and ownership, experiences show that the government systems are not very responsive and staff is assigned to dual tasks where the regular task receives priority. Considering this element in the design process build efficient ways of financial management is necessary. Recruiting staff or remunerating extra hours of work of the administrative staff is necessary to increase efficiency.

viii) Another phase of the project is needed in the project areas for consolidation before replicating in new areas. However, the new phase should include the largely influential potato seed supplying belts in Oromia and Amhara regions so that the concept of clean seed and QDS is meaningfully applied.

Annex1: SCOPE OF WORK

February, 2013

I. EVALUATION TITLE

Performance Evaluation on the **"Better Potato for Better Life"** Project

II. PERFORMANCE PERIOD

The proposed performance period for this evaluation is from April to July 2013.

III. FUNDING SOURCE

USAID/Ethiopia

IV. PURPOSE AND USE OF THE EVALUATION

The overriding purpose of this performance evaluation is to get an independent assessment of the overall performance of the project.

The evaluation will help to inform the Mission about what the project has been able to achieve, the factors that were necessary for its success, and the challenges faced during implementation. The findings are also necessary to inform the design and implementation of similar projects in line with the Mission Country Development Cooperation Strategy (CDCS), Development Objective 1 "Increased Growth and Resiliency in Rural Ethiopia", specifically Intermediate Results 2, "Livelihood transition opportunities increased" and IR 5, "Nutritional Status of women and young children improved".

Specifically, the evaluation will:

1. Assess the extent to which planned results (document both the quantitative and qualitative) of the project have been achieved vis-à-vis the project objectives and goal.
2. Assess the effectiveness of the project's approaches towards the achievement of its objectives and key results;
3. Establish evidence that suggests that the project activities are replicable and would produce similar results if it were tried elsewhere.
4. Identify lessons learned and challenges and make clear, explicit and actionable recommendations, including suggestions of options to improve the design and implementation of future similar projects.

V. BACKGROUND

Potato and sweet-potato are two underutilized crops in Ethiopia with a high potential to significantly contribute to reducing food insecurity and improved nutrition. They are highly complementary crops where potato is suitable for most of the highland areas and sweet potato suitable for most of the non-arid lowland areas. Together, they possess the potential to provide farmers with an additional less-labor intensive energy source than grain crops. Both crops produce more food per unit area than any of the other major food crops; provide large quantities of dietary energy, high-quality protein, vitamins, and minerals; and are high in dietary fiber and rich in antioxidants.

Over the last three years CIP has been implementing the USAID funded 'Better Potato for Better Life' project in Tigray and SNNP regions with a total budget of $5 million. The project is implemented in both regions with an objective to enhance the livelihoods of food insecure rural farmers by strengthening the national capacity to create sustainable access of poor farmers to high quality potato and sweet potato planting material and demonstrate the potential enhancement of incomes through the establishment of at least four profitable value chains and assure that at least 250,000 households have improved food security and diet quality.

The project intends to exploit the potential of potato and sweet potato to reduce food insecurity and dependence on cereals. Furthermore, the CIP through this program was to strengthen public and private sector stakeholders to address the key constraints in potato and sweet potato production systems. For its implementation, CIP worked with the Ethiopian Institute of Agricultural Research (EIAR), the Tigray and Southern Agricultural Research Institutes, Regional Bureaus of Agriculture and international and local NGOs to implement the program in selected Woredas of both regions. The goal of the project was:

> *"To enhance the livelihoods of food insecure rural farmers in SNNPR and Tigray through the diversification of cropping systems, increasing potato and sweet potato productivity and strengthening potato and sweet potato value chains."*

The project had several specific objectives pertaining to both Potato and Sweet Potato crops in contributing to enhance the food security of rural farmers. These are detailed in the Program Description document and will be made available to the winner /contractor. In summary, the objectives entailed the following:

1. Establishing a sustainable and profitable potato and sweet potato seed system.
2. Building capacity for both researchers and regional research centers.
3. Improving the efficiency of the agricultural input and potato output value chain, and
4. Engaging in larger scale multiplication of clean, in-vitro sweet potato plantlets and linking it to regional multiplication efforts,

Over the last three years, CIP has successfully implemented the main task of multiplying and disseminating clean planting materials of both crops to groups of framers in both regions and conducted a participatory market chain development to stimulate connectivity between producers, traders, processors and consumers. Moreover, it has leveraged other donor resources in order to have a longer term and sustainable impact on improved seed supply and marketing system and capacity building of farmers, cooperatives and other stakeholders. The cumulative

number of households reached with quality planting material thus far is above 46,000 households for potato and over 100,000 households for sweet potato. In addition, CIP was engaged in providing technical trainings for government extension agents as well as for targeted farmers. The project has organized hundreds of seed producer groups of both crops in the two regions and is now covering over 40 woredas in both regions (list of woredas and groups will be provided).

Currently, a 15 months cost extension from October 2013 to December 2014 is requested for the BPBL project and the request is going through the approval process. Major activities proposed for the cost extension period are empowering Farmer Groups and Cooperatives (FGCs) involved in producing quality planting material of potato and sweet potato to manage seed production businesses and to compete in public tenders; develop, test and establish a low-cost seed inspection system for the production of quality declared planting material for potato and sweet potato; and establish functional and commercially viable value chains for planting material of both crops in SNNPR and Tigray regions.

The key results that were expected to be achieved by this project were its ultimate contribution to the project objectives, specifically enhancing the food security of rural farmers. Food security is defined as when people have regular access (either through production or purchasing) to sufficient food for a healthy and productive life. As such, there are "three distinct variables central to the attainment of food security: availability, access, and utilization." These variables are interrelated.

- **Food availability** is achieved when sufficient quantities of food are consistently available to all individuals.
- **Food access** is ensured when households and all individuals within them have adequate resources to obtain appropriate foods for a nutritious diet. Access depends upon income available to the household, on the distribution of income within the household and on the price of food.
- **Food utilization** is the proper biological use of food, requiring a diet providing sufficient energy and essential nutrients, potable water, and adequate sanitation.

The BPBL project was expected to address the three dimensions of food security mentioned above through its various activities. This requires achieving the following results:

Expected results	**Approach to measure the expected result**	**Data disaggregation**	**Source of information**	**Who collects the data**
Participating development organizations have developed good linkages with relevant research and private sector organizations	Collect qualitative data through interviewing sample development organizations & determine how many of them have linkages with relevant research & private sector organizations.	**Potato**	**Sample Development organizations**	**The evaluation contractor**

Average yields of potato in intervention areas increased	Collect quantitative data on potato and sweet potato yields from sample beneficiaries	**Potato and sweet potato**	**Sample Households**	**The evaluation contractor**
100,000 potato growers grow improved late-blight resistant potato varieties	Quantify the number of potato growers who grew improved late-blight potato secondary sources.	**Potato**	**Project reports**	**The evaluation contractor**
150,000 Potato seed producer associations are established in each intervention region and are linked to the private sector for commercialization	Quantify the number of potato seed producer associations established and linked to the private sector for commercialization	**Potato**	**Project reports**	**The evaluation contractor**
Members of potato seed producer associations used diffused light storage	Quantify the percentage of potato seed producer associations who use diffused light storage.	**Potato**	**Sample Potato seed producers associations**	**The evaluation contractor**
Farmers are better able to maintain their own clean potato seed without frequent recourse to external supplies	Quantify the %age of farmers who were able to maintain their own clean potato seed without frequent recourse to external suppliers out of the sample potato seed growers	**Potato**	**Sample Potato seed growers farmers**	**The evaluation contractor**
Farmers in target areas adopted at least one improved management techniques for **potato and sweet potato**	Quantify the %age of farmers who adopted at least one improved management techniques for potato and sweet potato	**Potato and sweet potato**	**Sample Potato growers farmers**	**The evaluation contractor**
Improved production to consumption chains created per target region for	Quantify the number of improved production to consumption chains created per target region	**Potato**	**Sample Potato growers farmers**	**The evaluation contractor**

potato	from sample potato farmers.			
New late–blight resistant potato and new sweet potato varieties acceptable to consumers identified and on pathway to release	Collect new late blight resistant potato & sweet potato varieties data acceptable to consumers in operation areas.	**Potato and sweet potato**	**Community members and key informants from district agricultural and rural development offices**	**The evaluation contractor**
Knowledge of farmers increased in profitable production of potato and sweet potato	Collect qualitative data by interviewing sample farmers on some aspects of improved potato production systems and management that could led to profitability.	**potato and sweet potato**	**Sample households**	**The evaluation contractor**
Farmers producing pro-vitamin A orange-flashed sweet potato or dual-purpose varieties increased	Quantify and compare the number of farmers producing pro-vitamin A orange-flashed sweet potato or dual-purpose varieties increased before and after the commencement of the project	**Sweet potato**	**Project report and secondary data from districts**	**The evaluation contractor**
Number of farmers producing sweet potato among farmers who have not grown the crop before	Quantify and compare the number of farmers producing sweet potato before and after the commencement of the project	**Sweet potato**	**Project report and secondary data from districts**	**The evaluation contractor**
Trained decentralized sweet potato vine multipliers established in each intervention region	Quantify sweet potato vine multipliers established in each intervention region.	**Sweet potato**	**Project report**	**The evaluation contractor**
Both men and women	Quantify (%) men and	**Sweet potato**	**Individuals in**	**The**

in target markets can correctly cite nutritional benefits from consuming orange-fleshed sweet potato	women who, among the individuals interviewed in selected markets, correctly cite two nutritional benefits from consuming orange-fleshed sweet potato.		**target/selected markets**	**evaluation contractor**

In addition to the above indicators, the evaluation team is also expected to track the below high level (outcome) indicators.

A. Nutritional Outcomes

1. Food Consumption Score (FCS) for participant and non-participant households by region
2. Dietary Diversity Index:
   - Index of dietary diversity,
   - Means and percentage of household meeting minimum dietary score among children between 6 and 23 months of age by region
3. Proportion of sample HHs encountering food security problems among participant and non-participant farmers

B. Household Income Outcomes

1. Average Farm HH Income from sale of potato and sweet potao
2. Contribution of potato & sweet potato to annual cash household income
3. Percent households using improved potat and sweet potatao varities

C. Productivity and Marketing Outcomes

1. Production Parameters for the season 2011/12 by region:

   (a) Mean plot area,

   (b) Total production, and

   (c)Yield

2. Mean potato and sweet potato production per household

3. Average production of potato and sweet potato sold among participant and non-participant farmers by region

VI. KEY EVALUATION QUESTIONS

The evaluation will assess project performance in terms of achievement of its objectives and results (outcomes and goal), the sustainability of these results and the overal management of the

project. Specific key questions related to performance, management, and sustainability of the project are indicated below in order of importance.

A. Performance Results

1. To what extent were planned results (both the quantitative and qualitative) of the project achieved vis-à-vis the project objectives and goal. Specifically with regard to the following:
    a. Diversification of cropping systems
    b. Increasing potato and sweet potato productivity
    c. Strengthening of the potato and sweet potato value chains
    d. Improving household incomes of food insecure rural farmers in SNNPR and Tigray from sale of increased surplus of potato and sweet potato production

B. Project Design &Management

1. How effective was the collaboration, coordination, and working relationship among the implementing partners and stakeholders, i.e. The International Potato Center (CIP), the Research Institutes in Tigray & SNNPR, the Ethiopian Institute of Agricultural Research (EIAR), Regional Bureaus of Agriculture, the NGOs & CBOs and others in the selected Woredas
2. How relevant was the project design and management structure in terms of the following:
    a. Enhancing implementation of activities,
    b. Influencing the overall project management's cultural environment

C. Sustainability& Replicability

1. What specific capacity building initiatives did the implementing partner undertake to ensure sustainablity of the project's activities and continued results in terms of the following:
    a. Institutional strengthening of regional research centers to maintain germplasm banks of clean planting material
    b. Human Capacity, with regard to both Researcher and smallholder farmer capacities in the management of potato diseases and maintaining healthy seed respectively
2. Is there evidence that suggests that the project activities are replicable and would produce similar results if it were tried elsewhere in other Woredas or regions.

D. Lessons Learned

1. What are the key lessons learned (both positive and negative) that can be drawn upon to inform future similar project designs.

VII. EVALUATION DESIGN AND METHODOLOGY

It is envisaged that this performance evaluation will employ mixed methods and triangulation of data in order to ensure that the evaluation findings fully respond to the purpose of the evaluation and answer the key evaluation questions.

a) Methodology

The methods should include the following:

- **Document Reviews**: Not only selected documents/items listed in the SOW but also materials assembled by other reviewers (particularly the baseline data), targets and annual performance reports (over the years) to assess progress as reported by CIP since its inception to date among other things.
- **Key Informant Interviews:** with CIP Senior Managers & coordinators & staff at regional level, EIAR & regional research institutes, USAID Activity Manager and other USAID partners in SNNPR and Tigray and others that operate nationally, Regional Bureaues of Agriculture, participating NGOs, key government ministries and agencies, Agricultural Extension Officers at the Woreda level & private sector seed multipliers.
- **Focus Group Discussions (FGDs),** with seed producer groups and smallholder farmers in the two regions.
- **Survey of Beneficiaries:** covering not only the ultimate recipients of the project services (the farmer households), but also intermediate beneficiaries such as the researchers at the various research centers. Note: The gender aspect should be integrated within the survey questionnaires.
- **Stakeholder Analysis**: should be used to determine the effectiveness of partnerships and institutional collaborations forged between CIP and the regional research centers, the regional bureaues of agriclture, the private sector partners, and with USAID in delivering the various project interventions.

b) Evaluation Design

This is a non-experimental design that will focus on measuring project results before and after project implementation using project monitoring and survey data. The before project data should be drawn from the Baseline Survey Report (December 2011) for "Better Potato for Better Life" project. It is important to note that although the baseline report was finalized in 2011, the data contained therein was collected from Agust to December 2010. Project implementation had started in February 2010.

For some of the indicators whose baseline data is missing, the evaluation contractor is expected to reconstruct baseline data using a recall method (for instance, by asking individuals or groups to provide informtion on socio-economic conditions before the start of the project), refer secondary sources and administrative data.

c) Data Sources and collection methods

The quantitative methods to be used are surveys of selected beneficiaries (using appropriate sampling method). A sample of non-beneficiaries will also be selected to compare the two groups in some parameters.

Secondary data sources such as project reports and woreda agricultural and rural development offices' records will be used to substantiate the primary data.

Sample Selection and Size: The Contractor will prepare a detailed assessment framework including sample size and instruments which will be reviewed and approved by USAID/Ethiopia. A multistage sampling procedure should be applied to select woredas, potato and sweet potato grower groups and households.

The assessment work will include field visits to a representative sample drawn from the list of beneficiaries by Woreda and Region.

The final data sources and collection methods will be developed by the team based on the identified evaluation questions.

d) Data analysis plan

Based on the data collection tools designed for the quantitative data, data will be summarized and descriptive analysis will be made to calculate frequencies, means, indices, scores and proportions or percentages using SPSS or any other appropriate software. Tabular, graphical and other relevant presentations of results can be used.

Thematic analysis will be employed for qualitative data in order to categorize, rank and rate the responses of the interviewees and discussants. Very insightful or special description of interviewees and discussants will be quoted word by word to corroborate findings from other data sources.

The evaluation team will be expected to triangulate information from quantitative and qualitative data collection methods to strengthen their rational explanation or interpretations of the data.

e) Strengths and limitations of the proposed evaluation design and methodology

The baseline survey of the project was conducted by a contractor outsourced by the implementing organization. USAID's involvement in this survey was limited and as a result some of the core indicators to be captured by this evaluation were not included in the baseline survey. The absence of such data will impact the rigorousness of the evaluation. Evaluators are expected to employ a retrospective method of establishing baseline data through collecting data from secondary sources and also posing questions to respondents on situations before the start of the project to strength and validate the evaluation results.

The strength of this evaluation design is that it employs both qualitative and quantitative data collection methods and this will strengthen and reinforce the rigor of the data and validity of the findings. However, any data limitations associated with using either method should be clearly documented as part of the final evaluation report.

VIII. TEAM COMPOSITION, SKILLS AND LEVEL OF EFFORT

Team Composition: The evaluation will be carried out by mixed team comprised of local experts with experience in Evaluation (the team leader), Food Security and Agricultural Research. The Evaluation Team Leader will be responsible for team coordination and ensuring the timeliness and quality of deliverables. The other team members will be responsible to carry out interviews/data collections, train and monitor lower level data collectors and compile, analysis and write the report as per their expertise. USAID/Ethiopia may propose internal staff members from the Mission to accompany the team during site visits or participate in key parts of the evaluation.

Team Qualifications: It is anticipated that the local consultant/firm should have the following skills:

- Knowledge of USAID/Ethiopia Programs

- Technical competence in the field of Economics, Agricultural Economics, Food Security, Agricultural Research, and Statistical analysis tools.
- Experience with data collection procedures, surveys, and manipulation of large databases, specifically the national household survey data, and
- Good communication skills and the ability to interact with Ethiopians and expatriates.

Specifically, the team members should have the following qualifications:

1. **Team Leader** with particular expertise in performance evaluation, having at least 10 years of practical experience in Ethiopia and /or other African countries and who has led at least two similar evaluation/studies. (Hired through the evaluation contractor).
2. **One Food Security Specialist** with at least 8 years of experience in managing and evaluating food security projects in Ethiopia and/or other African countries.(Hired through the evaluation contractor);
3. **One Agricultural Research specialist** with at least 8 years of experience in working with agricultural research centers in Ethiopia and/or other African countries. (Hired through the evaluation contractor).

The contractor can hire additional support staff, in particular for one-on-one interviews of beneficiaries and data entry, but staffing arrangement will be determined with the above cited key members of the team.

Below is an illustrative table for Level of Effort (LOE). Dates may be modified based on availability of consultants, key stakeholders and time for fieldwork. The bidder is expected to submit a detailed LOE, including other additional staff, if required.

Activity	Team Member(s)	Estimated total number of days	Total LOE	Period of Performance
Selection of Evaluation Contractor	USAID/Ethiopia	-		April 30
Review of documents and begin drafting evaluation protocol and survey instruments; plan logistics	3 Evaluation Team	4 days each	12	May 1- 5
In-briefing with USAID, team planning meetings; finalize work plan, protocol, and survey tools; organize logistics for field work	3 Evaluation Team	4 days each	12	May 6 -10
Field work including travel days	3 Evaluation Team	30 days each	90 (to be adjusted if in case additional staff is proposed))	May 11-June14

Preliminary data analysis and synthesis; drafting report and presentation materials	3 Evaluation Team	6 days each	30	June 17-24
Debriefing of Mission staffs	3 Evaluation Team	1 days each	3	June 25
Submission of draft report	3 Evaluation Team	5 days each	15	July 2
Mission sends technical feedback/comments on the draft report to the team leader	USAID/Ethiopia	-	-	July 9
Draft revised by the evaluation team and the evaluation contractor submits final report to Mission	3 Evaluation Team	5 days each	15	July16
Missions approves report	USAID/Ethiopia	-		July 29
Total number of days		**50**	**177** (to be adjusted if additional staff is proposed)	-

Travel over weekends may be required during site visits. Note that national holidays (Ethiopian and American) where the US Embassy and USAID are closed are observed.

IX. LOGISTICS

The evaluation contractor will be responsible for all travels and logistics.

X. DELIVERABLES AND PRODUCTS

Based on the above stated purpose, objectives and key tasks, the evaluation team will submit the following deliverables observing standard USAID branding/marking requirements:

1. The consultant/firm shall produce a short written report (no more than 5 pages of text in the body of the report, and an Executive Summary and annexes) for the initial debriefing meeting on its findings. This report shall focus on issues posed by this SOW.
2. The consultant/firm will also produce a final report of not more than 40 pages that shall include their detailed findings on the final performance evaluation of the BPBL project, which will be used by the Mission to inform future designs of similar programs. A suggested format is provided as Attachment A.

The specific deliverables include the following:

- The Evaluation Framework (Inception Report) that shows:
  - The design of the study
  - Methodology
  - The tools to be used in the analysis
- A short debriefing report
- Draft Evaluation Report, and
- Final Evaluation Report.

Note: The Evaluation Framework should include revised evaluation questions, detailed approach/methodology, survey protocol, data collection tools, and plans for analysis and dissemination of findings. The Team Leader will submit the evaluation framework to USAID/Ethiopia. USAID/Ethiopia will then review the proposed work plan/methodology and data collection tools and submit comments to the Team Leader prior to field work. The evaluation team will revise the work plan/methodology and data collection tools and send the final version to USAID/Ethiopia. The evaluation framework must be finalized and approved prior to the initiation of the interviews and site visits.

XI. EVALUATION PROCEDURE:

a) Team Planning Meeting (TPM):

The assignment will commence with a half day Team Planning Meeting (TPM). This meeting will allow the team to meet with the USAID/Ethiopia ALT staff and other relevant bodies to be briefed on the assignment. It will also allow USAID/Ethiopia to clarify to the team with the purpose, expectations, and agenda of the assignment. In addition, the team will clarify roles and responsibilities; review and develop final survey questions; review and finalize the assignment timeline and share with USAID/Ethiopia; develop data collection techniques, instruments, tools and guidelines; review and clarify any logistical and administrative procedures for the assignment; establish a team atmosphere, share individual working styles, and agree on procedures for resolving differences of opinion; develop a preliminary draft outline of the team's report; and assign responsibilities for the final report.

b) Interim Briefings including status reports: The Team Leader will provide weekly status reports on the evaluation plan implementation to USAID/Ethiopia.

c) PowerPoint Presentation (in MS PowerPoint) used during debriefing to USAID/Ethiopia staff on the preliminary findings and recommendations that address set of objectives and associated questions.

d) Draft report in English no longer than thirty pages, excluding coversheets and appendix. The report shall follow the general format indicated below:

(i) Coversheet indicating type of evaluation
(ii) Table of Contents
(iii) Acknowledgments
(iv) Acronyms
(v) Executive summary
(vi) Introduction
(vii) Background
(viii) Scope and Methodology
(ix) Findings
(x) Conclusions
(xi) Lessons learned
(xii) Recommendations
(xiii) References

(xiv) Appendix (includes, but not limited to, SOW, data collection instruments, sources identified, and list of people contacted or interviewed, statements of differences regarding significant unresolved differences of opinion by funders, implementer, and/or members of the evaluation team, if any).

The findings and recommendations should address set of project objectives, anticipated results and evaluation questions. All findings and recommendations should be linked to data gathered and referenced in the evaluation report. The Team Leader will submit the first draft report to USAID/Ethiopia one week after the end of the evaluation team's field visit. The Mission will provide consolidated, written comments to the evaluation team within 5 working days of receiving the draft report.

Raw Data: The evaluation team will provide electronic files of all raw data to USAID/Ethiopia for future.

e) Final report: Will address the Mission's comments. The Team Leader will submit the final unedited report to USAID/Ethiopia within 5 working days after the team receives consolidated comments from USAID/Ethiopia. The evaluation contractor will provide the edited and formatted final document approximately 5 days after USAID/Ethiopia provides final approval of the content. Procurement sensitive information will be removed from the final report and incorporated into an internal USAID Memo. The remaining report will then be released as a public document on the USAID Development Experience Clearinghouse (DEC) (http://dec.usaid.gov) and the evaluation contractor's web site.

The Contractor shall submit edited and formatted final document in 5 hard copies and electronically.

XII. RELATIONSHIPS AND RESPONSIBILITIES

a) The Evaluation Contractor

The evaluation contractor will coordinate and manage the evaluation team and will undertake the following specific responsibilities throughout the assignment:

- Recruit and hire the evaluation team.
- Make logistical arrangements for the consultants, including travel and transportation, in-country travel, lodging, communications and others.

b) USAID Ethiopia Mission

The USAID/Ethiopia's Assets and Livelihoods in Transition (ALT) Office in collaboration with the Program Office will provide overall technical leadership and direction for the evaluation team throughout the assignment and will undertake the following specific roles and responsibilities:

- **Respond to any queries about the SOW** and/or the assignment at large.
- **Consultant Conflict of Interest**: To avoid conflicts of interest or the appearance of a COI, reviews the CV's for proposed consultants and provide additional information

regarding potential COI with the project contractor or NGOs evaluated/assessed and information regarding their affiliates.

- **Documents**: Identify and prioritize background materials for the consultants and provide them, preferably in electronic form.
- **Site Visit Preparation**: Provide a list of seed producer groups by Region and Woreda for site visit locations, and key contacts.
- **Mission Point of Contact**: Throughout the evaluation work, ensure constant availability of the Point of Contact person and provide technical leadership and direction for the team's work.
- **Facilitate Contact with Implementing Partner**: Introduce the evaluation team to implementing partner and other stakeholders, and where applicable and appropriate prepare and send out an introduction letter for team's arrival and/or anticipated meetings.
- **Timely Reviews**: Provide timely review of draft/final reports and approval of the deliverables.

XIII. INSTRUCTION FOR THE PREPARATION OF THE PROPOSAL

Technical Proposal

Bidders shall prepare a technical proposal consisting of three factors below:

Factor 1 – Technical Approach (20-25 *page maximum*)

Technical approach at a minimum shall include the following information:

1. Description of the contactors proposed methodology to complete the evaluation as described in the SOW.
2. Draft work plan to include:
    a. Proposed timeline;
    b. Proposed evaluation design, methodology and schedule;
    c. Deliverables; and
    d. Draft outline of the evaluation report.

Factor 2 – Staffing Plan (2-3 *page maximum*)

The staffing plan at a minimum shall include the following information:

1. Description of the management structure of the proposed team.
2. Delineation of the roles and responsibilities of the members of the evaluation team to ensure coverage of all elements of the statement of work.
3. Description of the ability to access skilled staff to complete the evaluation
4. Resumes of members of the evaluation team (Not included in the 2 page limit – No page limit is established for submission of Resumes.)
5. Confirmation of the availability of the evaluation team throughout the completion of the evaluation.

Factor 3 – Past Performance Information (2-3*page maximum*)

Bidders briefly describe their past performance on similar projects. Past performance information shall include the following:

1. Up to three of the most recent and relevant contracts for efforts similar to the work detailed in the SOW.
2. For each contracts requested above, list contact names, job titles, mailing addresses, phone numbers, e-mail addresses, and a brief description of the work performed to include:
   - Scope of work or complexity/diversity of tasks;
   - Primary location(s) of work;
   - Term of performance;
   - Skills/expertise required;
   - Dollar value; and
   - Contract type (i.e., fixed-price, cost reimbursement, etc.)

Price Proposal

A firm bidding on this activity (Evaluation) must, in addition to its technical proposal, submit budge (in Excel) showing the projected level of effort (LOE) for each proposed full time and/or short-time member of the team including subject matter expertise and logistical support.

All other costs such as travel and *per diem*, in country costs for data collection and interviewing, communication, report preparation and reproduction should be included as appropriate.

XIV. EVALUATION CRITERIA/FACTORS

Applicants should note that these criteria serve to: (a) identify the significant matters which applicants should address in their applications and (b) set the standard against which all applications will be evaluated. To facilitate the review of applications, applicants should organize the narrative sections of their applications in the same order as the selection criteria.

The technical applications will be evaluated in accordance with the Technical Evaluation Criteria set forth below. Thereafter, the cost application of all applicants submitting a technically acceptable application will be opened and costs will be evaluated for general reasonableness, allowability, and allocability. To the extent that they are necessary, if award is not made based on initial applications, negotiations will be conducted with all applicants whose applications have a reasonable chance of being selected for award.

An agreement/s may be awarded to responsible applicant whose application offer the greatest value, cost and other factors considered. Award will be made based on the ranking of applications according to the selection criteria identified below. To make an objective evaluation possible, applications must clearly demonstrate how the organization and the application meet these criteria.

For overall evaluation purpose, technical factors are considered significantly more important than cost/price factors. The technical criteria are presented below in descending order of importance. There are no sub-criteria. The bullet statements listed under each technical criterion are illustrative, but not exhaustive, of the considerations that make up that criterion.

Technical Evaluation Criteria

A technical evaluation committee will evaluate applications based on the following specific evaluation criteria and corresponding weights:

Technical Evaluation Criteria	**Weight**
Factor 1 - Technical Approach	50 points
Factor 2 - Staffing Plan	30 points
Factor 3 - Past Performance	20 points
Total Possible Evaluation Points	**100**

1. Technical Understanding and Approach (50 Points)

The technical approach shall be evaluated in accordance with the following:

- Demonstration of a sound technical approach to complete the work outlined in the SOW, including the bidder's approach to conducting evaluation.
- Demonstration of an effective draft work that meets the requirements of the SOW and provides for realistic timelines, deliverables, and an effective draft outline of the final evaluation report.

2. Personnel and Management Plan (30 Points)

The staffing plan shall be evaluated in accordance with following:

- Demonstration of a sound and effective management structure of the proposed team, including clear expectations of roles and responsibilities of the members of the evaluation team to ensure coverage of all elements of the statement of work.
- The demonstration of professional qualifications, education and relevant experience of its proposed personnel, particularly in conducting evaluations of projects/programs working on food security and agricultural research in Ethiopia and other African countries.

3. Past Performance (20 Points)

Past performance shall be evaluated based on the implementation of projects or engagements similar in scope, size and complexity as evidenced by performance records and the testimony of clients. Bidders without evidence or record of relevant past performance will be evaluated neutrally for this criterion. The bullet statements listed below are illustrative considerations that make up this criterion.

- Exhibits past record of quality service provision, including consistency in meeting goals and targets.
- Exhibits a past record of timeliness of performance, including adherence to contract schedules and other time-sensitive project conditions, and effectiveness of team management to make prompt decisions and ensure efficient completion of tasks.
- Exhibits records of customer satisfaction, including satisfactory business relations, addressing the history of professional behavior and overall business-like concern for the interests of the customer, cooperative attitude in remedying problems, and timely completion of all administrative requirements.
- Exhibits records of effectiveness of team management, including appropriateness of personnel for the job and prompt and satisfactory changes in personnel when problems with clients where identified.

USAID/Ethiopia reserves the right to verify the experience and past performance record of cited projects or other recent projects by reviewing Contractor Performance Reports (CPR's), other performance reports, or to interview cited references or other persons knowledgeable of the bidder's performance on a particular project. The Government may check any or all cited references to verify supplied information and/or to assess reference satisfaction with performance. References may be asked to comment on items such as Quality of Product or Service, Cost Control, Timeliness of Performance, Customer Satisfaction, Key Personnel, and Utilization of Small Businesses. Bidders will be provided an opportunity to explain circumstances surrounding less than satisfactory performance reports if not previously provided the opportunity.

USAID may also check other sources of information about the bidder including, but not limited to, other government agencies, better business bureaus, published media, and electronic data bases.

Cost Evaluation Criteria

Proposed costs shall be analyzed for cost realism, reasonableness, completeness, and allowability. In its analysis USAID will assess question like: Are the costs realistic for the effort? Do the proposed costs demonstrate that the applicant understands the requirements, and are consistent with the applicant's technical application?

The following sections describe the documentation that applicants must submit to USAID. While there is no page limit for this portion, applicants are encouraged to be as concise as possible, but still provide the necessary detail to address the following:

- Provide a copy of the applicant's business/cost application, formatted in MS Excel file that is not right protected or that display the formula on each worksheet. Present the summary budget by year for proposed activity including uses of USAID funds.

- Include a detailed budget, in US dollars, with an accompanying budget narrative which can facilitate USAID's determination that costs are allowable, allocable and reasonable.

XV. MISSION CONTACT PERSONs

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XVI. REFERENCES (Project Document shall be available to the team once selected)

The following are some of the performance evaluation information sources that the consultant and/or firm should review:

- Task Order—Project Description
- The Better Potato for a Better Life – Baseline Survey Report (2011)
- CIP Selected Outcomes & Verifiable Indicators
- CIP Annual Reports and most recent Quarterly Reports
- Food Security relevant documents and reports
- The National Household Income and Consumption Survey Report

Annex 2: Details on the Methodology

2.1: Methods of Data Collection

2.1.1 Quantitative data

Review of documents: The consultancy service started with an in-depth review of documents related to the project; including the project proposal, baseline study report, results framework (logical frame), progress reports and other relevant documents. The review outputs were used as basis for preparation of data collection checklists and questionnaire used for data collection from different sources.

Household survey: Major outcomes of the project interventions were measured based on the data collected through household survey. Largely beneficiary farmers and non-beneficiaries (control) were randomly selected for the household survey. Data on area allocated to potato and sweet potato production, total production, yield, sales of potato and sweet potato products, varieties grown, where they got the seeds (seed system), engagement in potato seed production and sweet potato vine multiplication, the sources and quantity of household income, income from sales of potato and sweet potato, food consumption and nutrition indicators especially food consumption score (FCS) and dietary diversity index (DDI), and other relevant data were collected at household level.

Statistically sound sample size has been taken based on three standard parameters and formula used to get a representative sample for proportions: confidence interval, degree of variability and level of precision. Since the populations are large, we used the equation developed by Cochran (1963:75)[6] to yield a representative sample for proportions.

$$n = \frac{Z^2 p(1-P)}{e^2} \qquad \text{Eq. 1}$$

where n = sample size,

Z = Z statistic for a level of confidence (= 2.24; with 97.5% confidence interval),
P = expected prevalence or proportion (= 20%), and
e = precision level or sampling error (= 2.5%).

Based on the above formula, a total of 1,308 households (HHs) were selected in the two regions Tigray and SNNPR) where the sample size in the two regions were determined based on proportional to the size of the target population in the two regions. Accordingly, 219 (16.7%) of the sample HHs were from Tigray while the remaining 1089 (83.3%) were sampled from SNNPR. In both regions about 16.1% of the samples were female farmers. Since most of the measurable indicators make reference to the project beneficiaries, about 70% of the sample households were project beneficiaries while 30% were non-beneficiaries (control). About 85% of the sample respondents were head of the households while 11% are their spouses and 4 persons were able children who also participant in farming activities.

6 Cochran, W. G. 1963. Sampling Techniques, 2nd Ed., New York: John Wiley and Sons, Inc.

The project was implemented in 40 woredas of 14 zones of Tigray and SNNP regions. In order to capture the diversity, multistage sampling framework was adopted where in each region, zones and woredas were clustered into homogenous groups and samples were drawn from each cluster of zones and woredas based on sampling proportional to size. Therefore, two zones in Tigray and 4 zones in SNNPR and three woredas in Tigray and eight woredas in SNNPR were sampled. The woreda extension/focal persons assisted in identifying the control kebeles which are similar in context of the participating kebeles but that there is no project intervention. Accordingly, from the total of 11 sampled woredas; 7 are potato growers, 3 (Kachabira, Damot Gale & Arbaminch Zuria) are sweet-potato growers and 1 woreda (Hawzen) produces both crops. Among the sample kebeles 23 are project kebeles while the 14 are control kebles. It was observed during the field work and from the results of the data collected that the control farmers are not 'real control free from interventions' as there are extension services and improved input supply in many kebeles of the project woredas though the project is different in provision of clean seed. The impact of the project is also extended to the control kebeles through farmer to farmer technology transfer. The sample size is summarized in Table 1.1 while the number of respondents to survey questionnaire in each woreda is summarized Table A1.1 below.

Table A1.1: Summary of sample size distribution for the household survey

Region	*Woreda*	*No. of Kebeles (PAs)*	*Participant*			*Control*			*Total*		*Total*
			Male	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	
Tigray	Atsbi	3	72	7	79	35	1	36	107	8	115
	Hawzen	2	31	5	36	8	8	16	39	13	52
	Ofla	2	32	2	34	16	2	18	48	4	52
	Total	**7**	**135**	**14**	**149**	**59**	**11**	**70**	**194**	**25**	**219**
SNNP	Hulla	2	67	6	73	29	1	30	96	7	103
	Gumer	5	114	23	137	57	8	65	171	31	202
	Geta	5	156	52	208	64	26	90	220	78	298
	Misha	4	21		21				21		21
	Lemo	3	39		39	16	1	17	55	1	56
	Kachabira	5	114	22	136	44	12	56	158	34	192
	Damot Gale	4	108	20	128	46	9	55	154	29	183
	Arbaminch Zuria	2	15	6	21	13		13	28	6	34
	Total	**30**	**634**	**129**	**763**	**269**	**57**	**326**	**903**	**186**	**1,089**
Total		***37***	***769***	***143***	***912***	***328***	***68***	***396***	***1,097***	***211***	***1,308***

Source: Own survey; August, 2014

2.1.2 Qualitative data

Focus group discussion: Focus Group Discussions (FGDs) with the community members were major sources of qualitative data through which changes in variety of potato and sweet potatoes grown by the community, yield, activities and management of potato growers' cooperatives and groups, market linkage, project implementation strategies, capacity building activities done and institutional supports given, the outcomes and impacts brought about, sustainability, limitation, challenges, lessons, etc were explored and explained. FGDs were organized with project

beneficiary groups and control groups. FGDs were conducted in all of the sample kebeles (beneficiary and control) and a total of 343 farmers (25% female) participated in the discussion. The number of beneficiaries and control farmers included in the FGDs is summarized by woreda in Table A1.1 while the list of participants is given in section 2.3 of this Annex.

Table A1.2: Number of participants of FGDs by woreda

Woreda	Participant	Control	Total
Tigray			
Astbi	30	8	38
Hawzen	14	10	24
Ofla	11	14	25
Sub-total 1	**55**	**32**	**87**
SNNPR			
Arbaminc	11	0	11
Damot Ga	12	11	23
Geta	35	26	61
Gummer	43	17	60
Hulla	11	9	20
Kachabir	43	9	52
Lemo	12	0	12
Mesha	17	0	17
Sub-total 2	**184**	**72**	**256**
Total	***239***	***104***	***343***

Key informants interview: Key Informants Interviews (KIIs) were conducted with key actors in the project implementations such as sector offices involved in extension (agriculture, input and output marketing and cooperatives), CIP, GOAL, VITA, FAO, federal and regional research institutions, the private seed producer companies and nutrition promoters. Within the organizations; the office/organization heads, cooperative experts, agronomists, post harvest management experts, researchers, traders, farmers groups/co-operative heads, Development Agents (DAs), Health Extension Workers (HEWs) and others relevant informants were interviewed on the key variables to understand in-depth about the extent of the project performances. In total 52 KIIs were conducted where 101 participated in the interviewed. The summary of number of KII participants by organization is shown in Table A1.3 while their list is given in section 2.4 of this Annex.

Table A1.3: Number of KII participants by organization

S.No	*Organizations*	*KIIs conducted*	*Persons interviewed*
1	Woreda level sector offices	11	38
2	Regional Bureaus	2	2
3	Universities & Research centers	4	5
4	NGOs (international & local)	3	8
5	Private seed multipliers	5	5
6	Nutrition promoters	2	3
7	Project staff	4	4
8	Development Agents (DAs)	11	18
9	Health Extension workers	4	4
10	Co-operative managers	6	14
Total		***52***	***101***

Field observations were made in each of the selected project intervention kebeles and research centers; the physical structures constructed with the project support (like DLSs, tissue culture laboratories, etc), the living conditions of the people that signal their food security status, their houses, the farm lands and other assets built, children's physical conditions whether they have symptoms of malnutrition or not including their clothing, hygiene and sanitation conditions were observed.

Case studies: Some selected cases (HHs and co-operatives) were in-depth interviewed and observed to assess the relevance and benefits obtained from the implementation of the project activities and changes brought about on food security and livelihood of the households. This helps to exemplify the overall outcomes and impacts of the project and draw good lessons.

2.2 Data Collection Instruments

Systematically designed household survey questionnaire was used to collect quantitative data at HH level. The questionnaire consists of seven sections: i) identification, ii) HH size and features, iii) means of the HH livelihood, iv) livestock ownership, v) institutional services, vi) food consumption and vii) food security. The questionnaire is given in section 2.5 of this Annex.

The FGDs and KIIs were also guided by the checklists prepared to get detailed information from all stakeholders. The KII checklists were categorized in a ways that the questions become relevant for the respective stakeholders in section 2.6 of this Annex.

2.2.1 Household survey questionnaire

Introduction: (the enumerator introduces him/ herself and the purpose of the survey and gets confirmation of willingness of the farmer to be interviewed.

1. Identification:

1.1 HH ID No: |__|__|__|__|

1.2 Date of the Interview: Date|__|__| Month |__|__| Year|__|__|__|__|

1.3 Region 1. [ ] Tigray 2. [ ] SNNPR

1.4 Woreda 1. [ ] Hulla 2. [ ] Gumer 3. [ ] Geta 4. [ ] Misha 5. [ ] Lemo 6. [ ] Cachabira 7. [ ] Damot Gale 8. [ ] Arbaminch Zuria 9. [ ] Atsbi 10. [ ] Hawzen 11. [ ] Ofla

1.5 Kebele/Tabia name:_____

1.5a. Type of kebele: 1. [ ] Participant 2. [ ] Control

1.6 Agro-ecology as perceived by the respondent: 1) Lowland 2) Midland 3) Highland

1.7 Name of respondents: _____ Relationship with HH head/spouse: _____

1.8 Name of respondents (Head): 1) _____ 2) Name of spouse: _____

1.9 Educational level of the respondent (√): ____Grade [99] No formal education [50] Religious education

1.10 Marital status (√) 1. [ ] Married 2. [ ] Unmarried 3. [ ] Divorce4. [ ] Widowed

1.11 Religion 1. [ ] Muslim 2. [ ] Orthodox 3. [ ] Protestant 4. [ ] Others (specify)_____

1.12 Ethnic group of the household head: 1) Tigre, 2) Amhara; 3) Oromo; 4) Gurage; 5) Wolayita; 6) Kambata; 7) Sidama 8) Sodo; 9) Hadiya; Others (list)_____

Enumerator (Name and Signature): _____

To be completed at the field after interview has been completed

Name and signature of supervisor: _____

Date: _____

2. Household size and features

2.1 No. of household members by age and sex group

S.N	Age group	No. in the Household		
		Male	Female	Total
1	< 6 months			
2	6-23 months (<2 years)			
3	2-5 years			
4	>5-17 years			
5	18-64 years			
6	> 64 years			
	Total			

2.2 Is there any pregnant mother in the household? 1. Yes 2. No

2.3 If yes, how many? _____

2.4 Is there a lactating mother in the household? 1. Yes 2. No

2.5 If yes, how many? _____

3. Means of Livelihood of the Household

3.1. What are the means of livelihood for the household during 2006 EC?

Sr. No.	List of livelihood strategies	Rank in terms of importance	Who in the household participates? Put 1 if yes.			Income generated during 2006 EC (Birr)
			men	women	children	
1	Crop production					
2	Livestock production					
3	Beekeeping					
4	(Petty) trading					
5	Selling processed food/drink					
6	Handcraft (Carpentry, woodwork, metal work, etc)					
7	Employed (salaried)					
8	Wage work (casual)					
9	PSNP					
10	Remittance					
	Others					

3.2. Landholding and land use of the household

Code	Land use	Rainfed Area (ha)	Irrigated area (ha)	Total area (ha)
1	Annual crops			
2	Perennial crops			
3	Forest/wood lots			
4	Grazing/pasture area			
5	Home stead			
	Total			

3.3: Crop production during Belg season (using irrigation for Tigray) (2006 EC):

No.	Type of crop produced	Local seed		Improved seed		Quantity of input used (kg unless specified)					Source of improved seed[*1]	Amount produced (qt)		Quantity sold (qt)		Income from sales (Birr)
		Area (ha)	Production (qt)	Area (ha)	Production (qt)	Local seed	Improved seed	Compost (qt)	DAP	Urea		Local	Improved	Local	Improved	
A	**Vegetables**															
1	Carrot															
2	Beet roots															
3	Cabbage															
4	Kale/gomen															
5	Sweet potato															
6	Potato															
7	Onion															
8	Tomato															
9	Cassava															
10	Taro/Godare															
11	Yam															
B	**Staple crops**															
12	Teff															
13	Wheat															
14	Barley															
15	Maize															
16	Sorghum/															
17	Millet															
18	Oats															
C	**Pulse**															
19	Haricot bean															
20	Chick pea															
21	Horse bean															
D	**Oil crops**															
22	Niger seed/ Noug															
23	Groundnuts															
24	Flax (Telba)															
25	Sunflower															
E	Spices															

[*1] **Source of improved seeds**: 1= Own seed; 2= Free from neighbors; 3= Free outside village; 4= Bought neighbor; 5= Bought cooperative; 6= NGOs/Extension/ Research; 7= Market; Borrowed neghbor; 8= Community seed banks; 9 Seed grower farmers; 10= Private seed growers; 11= CIP; 12= others (specify)_____

3.4: Crop production during rainy season (2006 EC):

No.	Type of crop produced	Local seed		Improved seed		Quantity of input used (kg unless specified)					Source of improved seed[*1]	Amount produced (qt)		Quantity sold (qt)		Income from sales (Birr)
		Area (ha)	Production (qt)	Area (ha)	Production (qt)	Local seed	Improved seed	Compost (qt)	DAP	Urea		Local	Improved	Local	Improved	
A	**Vegetables**															
1	Carrot															
2	Beet roots															
3	Cabbage															
4	Kale/gomen															
5	Sweet potato															
6	Potato															
7	Onion															
8	Tomato															
9	Cassava															
10	Taro/Godare															
11	Yam															
B	**Staple crops**															
12	Teff															
13	Wheat															
14	Barley															
15	Maize															
16	Sorghum/															
17	Millet															
18	Oats															
C	**Pulse**															
19	Haricot bean															
20	Chick pea															
21	Horse bean															
D	**Oil crops**															
22	Niger seed/ Noug															
23	Groundnuts															
24	Flax (Telba)															
25	Sunflower															
E	Spices															

[*1] **Source of improved seeds**: 1= Own seed; 2= Free from neighbors; 3= Free outside village; 4= Bought neighbor; 5= Bought cooperative; 6= NGOs/Extension/ Research; 7= Market; 7= Borrowed neighbor; 8= Community seed banks; 9 Seed grower farmers; 10= Private seed growers; 11= CIP; 12= others (specify)_____

3.5 Did you produce potato for the last three years? 1) Yes 2) No (if **No, Go to Q3.23**)

3.6 Varieties/Cultivars of potato grown by production system (put √):

No.	Variety	Source*	Purpose for which it was grown: 1= seed; 2= ware	Belg (Irrigated in Tigray (ha)				Mehar (ha)			
				Area (ha)	Seeding rate (qt/ha)	Urea applied (kg/ha)	DAP applied (kg/ha)	Area (ha)	Seeding rate (qt/ha)	Urea applied (kg/ha)	DAP applied (kg/ha)
1	Bulle										
2	Jalane										
3	Gudane										
4	Wechacha										
5	Guassa										
6	Gera										
7	Menagesha										
8	Digemegn										
9	Tocha										
10	Local										
11	Others										

1= Own seed; 2= Free from neighbors; 3= Free outside village; 4= Bought neighbor; 5= Bought cooperative;
6= NGOs/Extension/ Research; 7= Market; 8=Borrowed neighbor; 9= Community seed banks; 10= Seed grower farmers;
11= Private seed growers; 121= CIP; 13= others (specify)_____

3.6a Cost of inputs, output price and disposal of potato produced

No.	Variety	Belg (irrigated in Tigary)						Mehar					
		Seed price (Birr/qt)	Urea price (Birr/qt)	DAP price (Birr/qt)	Chemical applied (Birr)	Production (qt.)	Price, output (Birr/qt)	Seed price (Birr/qt)	Urea price (Birr/qt)	DAP price (Birr/qt)	Chemical applied (Birr)	Production (qt.)	Price, output (Birr/qt)
1	Bulle												
2	Jalane												
3	Gudane												
4	Wechacha												
5	Guassa												
6	Gera												
7	Menagesha												
8	Digemegn												
9	Tocha												
10	Belete												
11	Local												
12	Others												

3.6b Labour input of potato produced (Man-Days)

No.	Variety	Belg (irrigated in Tigary)						Mehar					
		Land preparation	Planting	Cultivation	Weeding	Harvesting	Wage (Birr/day)	Land preparation	Planting	Cultivation	Weeding	Harvesting	Wage (Birr/day)
1	Bulle												
2	Jalane												
3	Gudane												
4	Wechacha												
5	Guassa												
6	Gera												
7	Menagesha												
8	Digemegn												
9	Tocha												
10	Belete												
11	Local												
12	Others												

3.7 What are the advantages of the variety provided by Better Potato Better Life project compared to the variety you used to grow before the project? Ask for the variety grown by the farmer **(put** √)

No.	Variety	Advantages								Satisfaction level*1
		Higher yield	Disease resistant	Short maturity period	Storability for longer time	Higher price	Good cookability	Good taste	Others (specify)	
1	Bulle									
2	Jalane									
3	Gudane									
4	Wechacha									
5	Guassa									
6	Gera									
7	Menagesha									
8	Digemegn									
9	Tocha									
10	Belete									
11	Local									
12	Others (specify)									

*1 note: 1= low; 2= moderate 3= highly satisfied

3.8 Have you learned better potato management practice from the project?

1) Yes 2) No

3.9 If yes, what are the practices learnt? **(Multiple Responses is Possible)**

1) Land preparation 2) Seed rate/planting 3) Cultivation and weeding)
4) Irrigation 5) Harvesting time/method 6) Pest and disease management

3.10 Was your potato field affected by disease or pest during 2006? If yes, by what?

Items	Belg (Irrigated)	Mehar
Occurrence of disease and pest (1= Yes; 2= No)		
Type of disease/pest (tick):		
1. Late blight		
2. Bacterial wilt		
3. Leaf roll		
4. Early blight		
5. Porcupine		

3.11 Do you think you still lack adequate knowledge in potato production?

1) Yes 2) No

3.12 If Yes, which knowledge do you lack? **(Multiple Responses is Possible)**

1) Proper land preparation
2) Using appropriate spacing
3) Piling a soil around the root zone
4) Applying recommended fertilizer
5) Controlling disease and insect pest
6) Selection of proper seed tuber size
7) Others (specify) _____

3.13 Where did you store seed potato (tuber) after harvest? **(Multiple Responses is Possible)**

1) Dark store 3) Store allowing light 5) Uncovered in field 7) Covered in field
2) Hole in ground 4) Dark space in house 6) Uncovered in house 8) Used sack
9) DLS 10) Others (specify) _____

3.14 Where did you store ware potato after harvest? **(Multiple Responses is Possible)**

1) Dark store 3) Store allowing light 5) Uncovered in field 7) Covered in field

2) Hole in ground 4) Dark space in house 6) Uncovered in house 8) Used sack
9) DLS 10) Others (specify) _____

3.15 For how long do you store potato? (months) what is the quantity stored?

Type	Belg/irrigated		Mehar	
	No. of months stored	Quantity stored	No. of months stored	Quantity stored
Ware potato				
Seed potato/tuber				

3.16 Disposal of potato produced (qt):

Utilization	Belg/irrigated		Mehar	
	1. Seed/tuber potato	2. Ware potato	1. Seed/tuber potato	2. Ware potato
Total quantity produced (qt)				
Amount sold				
Amount consumed				
Amount used for seed stock				
Amount damaged				
Other use				

3.17 Do you have partner to sell potato to? 1) Yes 2) No

3.18 If yes, has the project helped establishing market linkage for your product? 1) Yes 2) No

3.19 To whom do you sell your potato? **(Multiple Responses is Possible)**
1) Traders 3) Fellow farmers 5) Union/coops 7) Consumers
2) Institutions (e.g. university, hotel) 4) processors 6) NGOs 8) CIP
9) Others (specify) _____

3.20 What is your satisfaction with the current potato seed marketing system?

1) Not satisfied 2) Moderately satisfied (some issues) 3) Highly satisfied

3.21What are the challenges in potato production and marketing? **(Multiple Responses is Possible)**

1) Low yield 2) High fertilizer cost 3) Lack of demand 4) Low price of output
5) High seed cost 6) Brokers impact 7) Lack of seed
8) Absence of proper seed tuber size 9) Others (specify) _____

3.22 Do you feel that the system of accessing good quality potato planting materials is now well established so that you can easily get the seed? 1) Yes 2) No

3.22a Who in the household is targeted by the project in providing seed potato/tuber?
1) Men 2) Women 3) Child girl 4) Child boy

3.22b Who in the household is responsible for production, marketing, consumption and income control from potato production? **(put √)**

No.	Items	Men	Women	Child girl	Child boy
1	Potato production				
2	Potato selling				
3	Deciding on income from potato sales				
4	Consumption decision of potato				
5	Cooking potato				

3.22c. Are you now able to maintain your potato seed? 1) Yes 2) No

SWEET POTATO

3.23a. Did you produce Sweet potato for the last three years? 1) Yes 2) No (**if No, Go to Q4**)

3.23b **Varieties/Cultivars of sweet potato grown by production system:**

No.	Variety	Source*	Belg (irrigated in Tigray)					Mehar				
			Area (ha)	Vines planted (No.)	Urea applied (kg)	DAP applied (kg)	Pesticide (lt)	Area (ha)	Vines planted (No.)	Urea applied (kg)	DAP applied (kg)	Pesticide (qt)
1	Gadisa											
2	Koka 6											
3	Koka12											
4	Guntute											
5	Tulla											
6	Kulfo											
7	Ogansagan											
8	Hawassa 83											
9	Beletech											
10	Others (specify)											

1= Own seed; 2= Free from neighbors; 3= Free outside village; 4= Bought neighbor; 5= Bought cooperative;
6= NGOs/Extension/ Research; 7= Market; 8=Borrowed neighbor; 9= Community seed banks;
10 Seed grower farmers; 11= Private seed growers; 12= CIP; 13= others (specify)_____

3. 23b Cost of inputs, output price and disposal of potato produced

No.	Variety	Belg (irrigated in Tigary)						Mehar					
		Vines price (Birr/qt)	Urea price (Birr/qt)	DAP price (Birr/qt)	Chemical applied (Birr)	Production (qt.)	Price, output (Birr/ qt)	Vines price (Birr/qt)	Urea price (Birr/qt)	DAP price (Birr/qt)	Chemical applied (Birr)	Production (qt.)	Price, output (Birr/qt)
1	Gadisa												
2	Koka 6												
3	Koka12												
4	Guntute												
5	Tulla												
6	Kulfo												
7	Ogansagan												
8	Hawassa 83												
9	Beletech												
10	Others (specify)												

3. 23c Labour input of potato produced (Man-Days)

No.	Variety	Belg (irrigated in Tigary)						Mehar					
		Land preparation	Planting	Cultivation	Weeding	Harvesting	Wage (Birr/day)	Land preparation	Planting	Cultivation	Weeding	Harvesting	Wage (Birr/day)
1	Gadisa												
2	Koka 6												
3	Koka12												
4	Guntute												
5	Tulla												
6	Kulfo												
7	Ogansagan												
8	Hawassa 83												
9	Beletech												

10	Others (specify)												

3.23d Source of and satisfaction with sweet potato varieties

No.	Variety	Source[*1]	Satisfaction level[*2]	
			Belg/Irrigated	Mehar
1	Gadisa			
2	Koka 6			
3	Koka12			
4	Guntute			
5	Tulla			
6	Kulfo			
7	Ogansagan			
8	Hawassa 83			
9	Beletech			
10	Others (specify)			

[*1] note: 1= Own vines; 2= Free from neighbors; 3= Free outside village; 4= Bought neighbor; 5= Bought cooperative; 6= NGOs/Extension/ Research; 7= Market; Borrowed neghbor; 8= Community seed banks; 9 Seed grower farmers; 10= Private seed growers; 11= CIP; 12= others (specify)_____

[*2] Note: 1= low; 2= moderate 3= highly satisfied

3.24 What are the advantages of the variety provided by Better Potato Better Life project compared to the variety you used to grow before the project? Ask for the variety grown by the farmer (Tick)

No.	Variety	Advantages							
		Higher yield	Disease resistant	Short maturity period	Storability for longer time	Higher price	Good cookability	Good taste	Others (specify)
1	Gadisa								
2	Koka 6								
3	Koka12								
4	Guntute								
5	Tulla								
6	Kulfo								
7	Ogansagan								
8	Hawassa 83								
9	Beletech								
10	Others (specify)								

3.25 Was there a problem of getting adequate vine? 1) Yes 2) No

3.26 If yes, what were the problems of getting clean vines? **(Multiple Responses is Possible)**

1) Absence of clean vine producer, 2) Limited vines from clean vine producer
3) Long distance to suppliers 4) Expensive to buy
5) Others (specify)_____

3.27 Have you learned better sweet potato management practice from the project?

1) Yes 2) No

3.28 If yes, what are the practices learned? **(Multiple Responses is Possible)**

1) Land preparation 2) Seed rate/planting 3) Cultivation and weeding)
4) Irrigation 5) Harvesting time/method 6) Pest and disease management

3.29 When did you collect the vine and make it ready for planting?

1) Planted immediately after taking from multiplication site

2) Planted it after taking it out one day from the day of planting
3) Planted it after taking it out two days from the day of planting
4) Others (specify)

3.30 Do you feel that the system of accessing good quality sweet potato planting materials is now well established so that you can easily get the vines? 1) Yes 2) No

3.31 Do you think you still lack adequate knowledge in sweet potato production?
1) Yes 2) No

3.32 If Yes, which knowledge do you lack? **(Multiple Responses is Possible)**
1) Proper land preparation
2) Using appropriate spacing
3) Piling a soil around the root zone
4) Controlling disease and insect pest
5) Absence of proper vines
6) Others (specify) _____

3.33 Where did you store sweet potato after harvest? **(Multiple Responses is Possible)**

1) Dark store 3) Store allowing light 5) Uncovered in field 7) Covered in field
2) Hole in ground 4) Dark space in house 6) Uncovered in house 8) Used sack
9) DLS 10) Others (specify) _____

3.34 For how long do you store sweet potato? (Months) what is the quantity stored?

Belg		Mehar	
No. of months stored	Quantity stored	No. of months stored	Quantity stored

3.35 Disposal of sweet potato produced (qt):

Utilization	Belg	Mehar
Total quantity produced (2006EC)		
Amount sold		
Amount consumed, human		
Amount fed to livestock		
Amount damaged		
Other use		

3.36 Do you have partner to sell sweet potato to? 1) Yes 2) No

3.37 If yes, has the project helped establishing market linkage for your product? 1) Yes 2) No

3.38 To whom do you sell your sweet potato? **(Multiple Responses is Possible)**

1) Traders 3) Fellow farmers 5) Union/coops 7) Consumers
2) Institutions (e.g. university, hotel) 4) processors 6) NGOs 8) CIP
9) Others (specify) _____

3.39 What are the challenges in sweet potato production and marketing? **(Multiple Responses is Possible)**

1) Low yield 3) High fertilizer cost 5) High seed cost 7) Lack of clean vines
2) Lack of demand 4) Low price of output 6) Brokers impact
9) Others (specify) _____

3.40 Do you use sweet potato leaves for livestock feed? 1) Yes 2) No

3.41 What is the advantage of the new sweet potato variety over the local variety regarding feed?

1) High feed volume 3) Nutritious 4) Increased milk yield
5) Others (specify) _____

3.42 Who in the household is targeted by the project in providing sweet potato vines?
1) Men 2) Women 3) Child girl 4) Child boy

3.43 Who in the household is responsible for production, marketing, consumption and income control from sweet potato production? **Tick**

No.	Items	Men	Women	Child girl	Child boy
1	Potato production				
2	Potato selling				
3	Deciding on income from potato sales				
4	Consumption decision of potato				
5	Cooking potato				

3.43a Who in the household is responsible for production, marketing, consumption and income control from sweet potato production? **Tick**

No.	Items	Men	Women	Child girl	Child boy
1	Sweet potato production				
2	Sweet potato selling				
3	Deciding on income from sweet potato sales				
4	Consumption decision of sweet potato				
5	Cooking sweet potato				

3.44 Are you now able to maintain your sweet potato planting material? 1) Yes 2) No

4. Livestock ownership

4.1. Type and number of livestock owned during the last one year

Livestock type	**No. owned 4 years ago**	**No. owned now**	**Sold during last 1 year**	
			No. sold	Income (Birr)
Camels				
Cows				
Heifer				
Calves				
Oxen/bull				
Sheep				
Goats				
Poultry				
Donkey				
Mule				
Horse				

4.2 Livestock products and income (all questions valid for period of last one year)

No	Type of livestock products	Unit of production (Code A)	Amount produced in 1 week	How many month was such production done last 1 year?	Unit of sales (Code A)	Amount sold (in 1 week)	Income generated from sales in 1 week (Birr)
1	Milk						
2	Cheese						
3	Arera						
4	Butter						
5	Egg						
6							

Code A: 1= Liter; 2= Number; 3= kg

5. Institutional services

5.1 Do you get extension advice on vegetable crops production? 1) Yes 2) No

5.2 If yes, how many days per month during the last production season, from whom and for which crops?

No.	Crop types	Extension providers*	No. of days extension provided
1	Cereals		
2	Fruits		
3	Potato		
4	Sweet potato		
5	Other vegetables and root crops		

* 1= Agri. office; 2= NGOs; 3=Research institutions; University

5.3 Do you get extension service on livestock production? 1) Yes 2) No

5.4 If yes, how many days per month during the last production season, from whom and on what aspect?

No.	Crop types	Extension providers*	No. of days extension provided
1	Dairy		
2	Beef/fattening		
3	Sheep/goats		
4	Poultry		

* 1= Agri. office; 2= NGOs; 3=Research institutions; University

5.5 Do you have sufficient capital to purchase agricultural inputs? 1) Yes 2) No

5.6 If No, did you receive credit for input purchase during 2006 EC? 1) Yes 2) No

5.7 If yes, how much? _____Birr (or equivalent to it)

5.8 How far is the major market place where you sell potato and sweet potato? _____Minutes single trip.

6. Food Consumption

6.1 Which food stuffs are commonly fed to the children, lactating/pregnant mothers and others in your household? Mark with √ as appropriate.

Code	***List of food items commonly consumed***	***Pregnant mothers***	***Lactating mothers***	***Children (6-23months)***	***Other HH members***
1	Vegetables				
2	Cereals				
3	Pulses				
4	Fruits				
5	Honey				
6	Milk				
7	Meat				
8	Egg				
9	Fish				
10	Oil				
11	Iodized salt				
12	Roots/tubers (yam, cassava, taro, sweet potato, potato)				
	Others (specify)				

6.2 Which food items were consumed by all members of the HH and by children aged 6-59 months during the past 7 days? How frequent did they consume (in days) during the past/last 7 days?

Code	***Food items***	***No. of days of consumption by the HH*** (*in days*)	***No. of days of consumption by children*** **(6-59 months age) (** *in days***)**
1.1	Maize , maize porridge, rice, sorghum, millet pasta, bread and other cereals		
1.2	Cassava, potatoes and sweet potatoes		
2	Beans. Peas, groundnuts and cashew nuts		
3	Vegetables and leaves		
4	Fruits		
5	Beef, goat, poultry, pork, eggs and fish		
6	Milk yogurt and other diary		
7	Oils, fats and butter		

6.3 Which food items were consumed by children aged 6-23 months, pregnant women and lactating women during the past 24 hours? Mark with √ as appropriate.

Code	***Food items***	***Consumed by the HH***	***Consumed by children*** (6-23 months age)	***Consumed by pregnant & lactating women***
1.1	Maize , maize porridge, rice, sorghum, millet pasta, bread and other cereals			
1.2	Cassava, potatoes and sweet potatoes			
2	Beans. Peas, groundnuts and cashew nuts			
3	Vegetables and leaves			
4	Fruits			
5	Beef, goat, poultry, pork, eggs and fish			

6	Milk yogurt and other diary			
7	Oils, fats and butter			

6.4 How old is your youngest child now? 1) 6 - 8 months 2) 9 – 23 months

6.5 Is he/she now on breast feeding? 1) Yes 3) No

6.6 How frequent *(No. of meals)* the children (6-23 months of age) consumed the following food items within the past 24 hours? *(write the # of meals in the table) write 0 if it is not consumed*

Code	***Food items***	***6 - 8 months child***		***9 - 23 months child***	
		Breast-fed	***Non-breast fed***	***Breast-fed***	***Non-breast fed***
1.1	Maize , maize porridge, rice, sorghum, millet pasta, bread and other cereals				
1.2	Cassava, potatoes and sweet potatoes				
2	Beans. Peas, groundnuts and cashew nuts				
3	Vegetables and leaves				
4	Fruits				
5	Beef, goat, poultry, pork, eggs and fish				
6	Milk yogurt and other diary				
7	Oils, fats and butter				

6.7 What do you think about the consumption of potatoes and sweet potatoes in your HH now compared to the situation before the project? 1) Increased 2) The same 3) Decreased

6.8 Is the orange flavoured sweet potato (OFSP) consumed in the household? 1) Yes 2) No

6.9 If yes, who consumes it? **(Multiple Responses is Possible)**

1) Children; 2) Women 3) child girls 4) child boys; 5) pregnant women;

6) lactating women

6.10 If it is increased, what are the possible reasons? **(Multiple Responses is Possible)**

1)Increased production 2) Increased HH incomes

3) Nutrition promotion increased awareness

4) Knows the health benefits of those crops 5) Others (specify)_____

6.11 How much of your family members like to eat potatoes & sweet potatoes usually?

1) All 2) Partial 3) None

6.12 Do you know about the health and nutrition benefits of potatoes & sweet potatoes?
1) Yes 2) No

6.13 If yes, would you please mention some of them? _____

_____

6.14 What is/are your source/s of knowledge about nutrition?
1) Radio programs 2) Door to door campaigns 3) Advertises 4) From friends
5) Other (specify) _____

7. Food Security

7.1 How many months can you feed your household from the crop produced during the last production season?_____ months

7.2 How many months could you feed your household from the crop produced before participating in this project?_____ months

7.3 Have you encountered food shortage during the last one year? 1) Yes 2) No

7.4 If yes, in which month/s does the HH face food problems (insufficient food)? Put "√"

1=Jan	2=Feb	3=March	4=April	5=May	6=June	7=July	8=Aug	9=Sept	10=Oct	11=Nov	12=Dec

7.5 What did you do when there was insufficient food for the household? Coping mechanisms applied by the HHs during food in-sufficient months (if applied during last 2 years)

No.	***Strategy***	***Yes***	***Rank in order they occur (if yes)***
1.	Use own saving to buy food/grain		
2.	Sell livestock to buy food/grain		
3.	Sell household assets to buy food/grain		
4.	Hunt wild animals		
5.	Depend on wild fruits, roots, leaves, etc		
6.	Borrow from relatives (money or food)		
7.	Depend on social support/aid		
8.	Cut and sell trees/charcoal		
9.	Migrate to urban area		
10.	Reduce meal size (amount consumed per day)		
11.	Reduce meal frequency (no. of meals per day)		
12.	Remittance support		
13.	Lease land		
14.	Others (specify)		

7.6 Overall, how do you evaluate the benefits of this project to your household?

1) Low 2) Medium 3) Very high

7.7 What do you suggest future projects should focus on? _____

_____

_____

Thank you very much for your cooperation!

2.2.2 Checklist for FGDwith farmers (beneficiaries)

i) Project design, participation and knowledge about the activities done

- How was the project initiated and designed? How the community members participated in the design phase? What about women participations?
- How was the beneficiaries selected? What were the criteria for selection?
- What are the activities supported by the project? Please tell us the extent of this support.
- What is the accomplishment so far?

ii) Project relevance:

- how do you assess the relevance of the project support in your area to address the priority needs of the community? What about its focus on potato and sweet potato? Relevance to the selected targets (farmers or HH) beneficiaries?
- to what extent does the project contributed to increase productivity? What is the added value of this project?
- suitability of the project interventions with your local contexts and consistency with woreda and kebele/PA development plans?
- relevance in addressing food insecurity (availability, access and utilization) and nutrition related problems? What is the extent of food insecurity in the area?
    - Who is more affected (men, women, children (boys and girls), poor (male and female), livestock keepers, etc)?
    - Who is less affected?
    - Proportion of households (male headed and female headed) with food gaps (food insecurity)?
    - What is the average number of months households (male and female headed) can feed themselves from their own harvest? Which months are food scarce months, how do communities cope up with the food gaps?
    - Do you know signs of child or pregnant/lactating mothers' dietary deficiency? Tell us the symptoms? What has been done to address these? What kind of food items most of the HHs consumed frequently?

iii) Effectiveness

→ Were all project activities implemented as desired? If there were limitations, please elaborate.
→ How the groups or individual members/households benefited from the implemented project activities? Total number of beneficiary households? (MHH and FHH)
→ What results have been obtained from the implementation?

iv) Project Management

- effectiveness of the collaboration and coordination and working relationship among the implementing partners and stakeholders;
- relevance of the project structure in enhancing implementation of activities and culture of project management environment;
- Limitations of the project organization and management;

v) Sustainability and replicability

- what capacity exist or built to ensure sustainability of project activities and continued results;
- institutional strength of research institutes to maintain germ plasma banks of clean planting material-staffing, facilities, skill, budget, etc. in place to ensure sustainability;
- established working mechanisms for seed production and marketing and institutional capacity to support this;
- existence and functionality of potato seed regulatory system;
- extent of engagement of private sector in seed supply;
- the extent to which the potato/sweet potato and seed potato/sweet potato production are replicated in non-project kebeles and woredas;

vi) Lessons learned: what lessons can be drawn in the following aspects:

- the project management and partnership;
- addressing local needs and improving the food security and livelihood of the farmers: creating access to food and dietary diversification;
- strength and limitations;
- targeting;
- establishing and enhancing potato/sweet potato seed system;
- potato value chain development

2.2.3 Checklists for KII

2.2.3.1 Checklist for interviewing the Development Agents (DAs)

Institution: _____Name: _____ Position: _____Contact: ____

i) What are the activities supported by the project? Please tell us the extent of this support.

ii) What is the accomplishment so far?

iii) Project relevance:

- how do you assess the relevance of the support to developing improved varieties/cultivars of potato and sweet potato?
- to what extent does the project contributed to the achievement of your organization's objectives? What is the added value of this project?
- suitability of the intervention at the project sites and consistency with woreda development plans;
- relevance in addressing food insecurity (availability, access and utilization) and dietary diversification;

iv) Project design and management

- effectiveness of the collaboration and coordination and working relationship among the implementing partners and stakeholders;
- relevance of the project structure in enhancing implementation of activities and culture of project management environment;
- Limitations of the project organization and management;

v) Sustainability and replicability

- what capacity exist or built to ensure sustainability of project activities and continued results;
- institutional strength of research institutes to maintain germ plasma banks of clean planting material-staffing, facilities, skill, budget, etc. in place to ensure sustainability;
- established working mechanisms for seed production and marketing and institutional capacity to support this;
- existence and functionality of potato seed regulatory system;
- extent of engagement of private sector in seed supply;
- the extent to which the potato/sweet potato and seed potato/sweet potato production are replicated in non-project kebeles and woredas;

vi) Lessons learned: what lessons can be drawn in the following aspects:

- the project management and partnership;
- addressing local needs and improving the food security and livelihood of the farmers: creating access to food and dietary diversification;
- strength and limitations;
- targeting;
- establishing and enhancing potato/sweet potato seed system;
- potato value chain development

2.2.3.2 Check list for KIIs (Research Institutions, Universities and Seed Multipliers)

EIAR, TARI, SARI, YB Biotechnology Center PLC, Minora Business group PLC; Solagrow/VCI

Institution: _____Name: _____ Position: _____Contact: ____

i) What are the activities supported by the project? Please tell us the extent of this support.

ii) What is the accomplishment so far?

iii) How do you assess the relevance of the support to developing improved varieties/cultivars of potato and sweet potato?

iv) To what extent has the project contributed to the achievement of your organization's objectives? What is the added value of this project?

v) Which are the organizations collaborating with your organizations in relation to potato and sweet potato research? What is the manner of your collaboration? What is the contribution of the Potato project to this collaboration?

vi) How do you evaluate the project management and its structure compared to other projects you have known? Do you see any limitation in the project organization and management?

vii) What capacity exists or built to ensure sustainability of project activities and continued results?

viii) How do you assess the strength of your research institute to maintain germ plasma banks of clean planting material-staffing, facilities, skill, budget, etc. in place to ensure sustainability? Do you think the results of this project will sustain when it phases out?

ix) How far the research results helped strengthening of the seed system?

x) Sustainability and replicability

- established working mechanisms for seed production and marketing and institutional capacity to support this;
- existence and functionality of potato seed regulatory system;
- extent of engagement of private sector in seed supply;
- the extent to which the potato/sweet potato and seed potato/sweet potato production are replicated in non-project kebeles and woredas;

xi) Lessons learned: what lessons can be drawn in the following aspects:

- the project management and partnership;
- addressing local needs and improving the food security and livelihood of the farmers: creating access to food and dietary diversification;
- strength and limitations;
- targeting;
- establishing and enhancing potato/sweet potato seed system;
- potato value chain development

2.2.3.3 Checklist for interviewing the nutrition promoters

Institution: _____Name: _____ Position: _____Contact: ____

- Mums for Mums, Tigray;
- EgnaLeenga, SNNPR; Farm Radio International, SNNPR

Institution: _____Name: _____ Position: _____Contact: ____

1. How have you collaborated with CIP better potato better life project?
2. What are the activities supported by the project? Please tell us the extent of this support. How relevant is the project support in fulfilling the objectives of your organization?
3. What activities have been implemented so far?
4. Number of nutrition promotions conducted?
   - ✓ Door to door campaigns,
   - ✓ Advertising,
   - ✓ Radio broadcasts, Others (specify) _____
5. The topics and approaches/media that the promotion activities done?
6. What are the contents of the promotion made?
7. How many households have been reached by the promotion?
8. Perceived changes (recognized) brought about the promotion activities done?
9. Have you conducted trainings?
   - Who was trained? And for how long? On what topics?
10. How is the alignment of your intervention area and the Potato/sweet potato project intervention areas?
11. What are the added values of this project in enhancing nutrition security?
12. What results have been achieved due to the training and nutrition promotion?
13. Do you think the result obtained will be sustainable? Explain
14. Do you have the capacity to continue the current effort or expand it?
15. What are the challenges facing the nutrition promotion?
16. What are the limitations of the collaboration with BPBL project?
17. What improvement should be considered in future projects of similar nature on potato and sweet potato?
18. How do you evaluate the project management and its structure compared to other projects you have known? Do you see any limitation in the project organization and management?
19. Any other suggestions, please?

Thank you very much for your cooperation!

Annex 3: Tables and Figures

Table A3.1: Average household size for the total sample

	Participants			Control			Total sample		
Age group	Male	Female	Total	Male	Female	Total	Male	Female	Total
< 6 months	1.2	1.0	1.1	1.1	1.0	1.0	1.14	1.02	1.09
6-23 months (<2 years)	1.0	1.0	1.0	1.0	1.0	1.1	1.00	1.02	1.03
2-5 years	1.1	1.1	1.2	1.0	1.1	1.2	1.07	1.12	1.20
5-17 years	1.9	1.7	2.9	1.8	1.7	2.8	1.87	1.69	2.88
18-64 years	1.5	1.3	2.8	1.6	1.4	2.9	1.53	1.37	2.78
> 64 years	1.0	1.0	1.3	1.0	1.0	1.2	1.03	1.02	1.26
Total	3.2	3.0	6.2	3.1	3.0	6.0	3.19	2.98	6.13

Table A3.2: Average household size by region

	Tigray						SNNPR					
	Participants			Control			Participants			Control		
Age group	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
< 6 months	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.0	1.1	1.1	1.0	1.0
6-23 months (<2 years)	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0
2-5 years	1.1	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.2	1.1	1.1	1.2
5-17 years	1.9	1.7	2.8	1.6	1.5	2.5	1.9	1.7	2.9	1.9	1.7	2.9
18-64 years	1.6	1.4	2.8	1.5	1.4	2.6	1.5	1.3	2.7	1.6	1.4	2.9
> 64 years	1.0	1.0	1.2	1.0	1.0	1.1	1.1	1.0	1.3	1.0	1.0	1.2
Total	3.4	3.1	6.4	2.9	3.0	5.6	3.2	3.0	6.1	3.1	3.0	6.1

Table A3.3: Proportion of sample respondents by education level (%)

	Tigray		SNNPR		Total sample		
Education level	Participant	Control	Participant	Control	Participant	Control	Total
Grade 1			1.6	2.8	1.3	2.3	1.6
Grade 2			4.3	5.2	3.6	4.3	3.8
Grade 3			12.3	9.5	10.3	7.8	9.6
Grade 4	8.1	5.7	7.9	6.4	7.9	6.3	7.4
Grade 5	7.4	7.1	6.7	7.1	6.8	7.1	6.9
Grade 6	9.4	7.1	9.6	8.3	9.5	8.1	9.1
Grade 7	6.7	2.9	5.1	5.8	5.4	5.3	5.4
Grade 8	2.0	7.1	9.3	7.1	8.1	7.1	7.8
Grade 9	1.3	2.9	5.5	4.9	4.8	4.5	4.7
Grade 10	4.7	12.9	4.6	4.3	4.6	5.8	5.0
Grade 11		1.4	0.9	0.9	0.8	1.0	0.8
Grade 12	0.7		2.9	2.5	2.5	2.0	2.4
College and above	4.7	1.4	0.9	0.6	1.5	0.8	1.3
Religious Education	10.7	4.3			1.8	0.8	1.5
Non formal Education	44.3	47.1	28.4	34.7	31.0	36.9	32.8
Average education upto high school completion	7	8	6	6	6	6	6

Table A3.4: Proportion of sample respondents by religion (%)

Relogion	Tigray			SNNPR			Total sample		
	Participant	Control	Total	Participant	Control	Total	Participant	Control	Total
Muslim	0.7	1.4	0.9	37.1	29.8	34.9	31.1	24.7	31.1
Orthodox	99.3	98.6	99.1	12.5	16.3	13.6	26.6	30.8	26.6
Protestant				47.8	53.1	49.4	40.0	43.7	40.0
Catolic				2.6	0.9	2.1	2.2	0.8	2.2

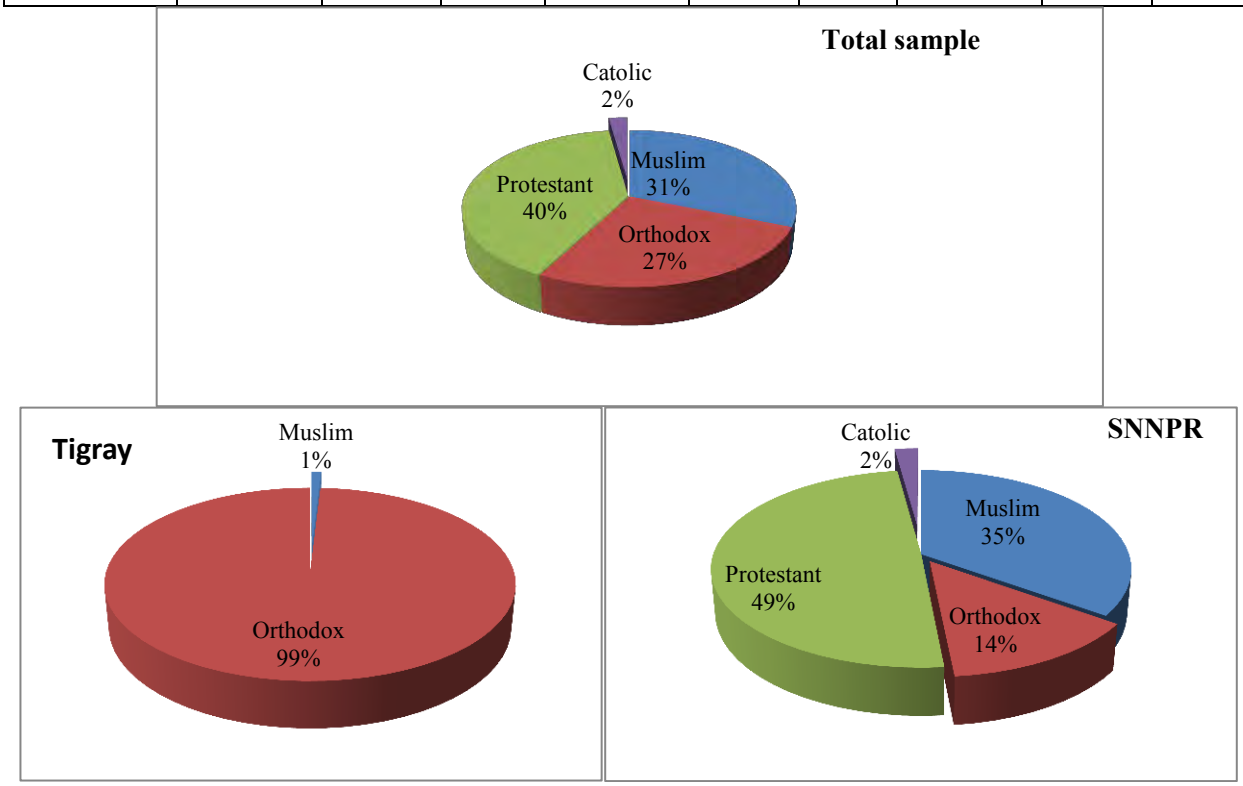

Figure A3.1: Distribution of the sample by religion of the respondents

Source: Own survey (August, 2014)

Table A3.5: Proportion of sample respondents by religion (%) Ethnicity of the respondents (%)

Ethnicity	Tigray			SNNPR			Total sample		
	Participant	Control	Total	Participant	Control	Total	Participant	Control	Total
Tigre	100	100	100		0.3	0.1	16.3	17.9	16.8
Amhara				0.3		0.4	0.2	0.5	0.3
Oromo					0.6	0.2		0.5	0.2
Gurage				45.2	0.6	45.9	37.8	39.1	38.2
Wolayita				16.4	47.5	17.1	13.7	15.4	14.2
Kambata				12.8	18.7	13.1	10.7	11.4	10.9
Sidama				9.4	13.8	9.2	7.9	7.1	7.6
Hadiya				13.1	8.6	11.0	11.0	5.1	9.2
Gamo				2.6	6.1	2.9	2.2	3.0	2.4
Amhara				0.1	3.7	0.1	0.1		0.1

Source: Own survey (August, 2014)

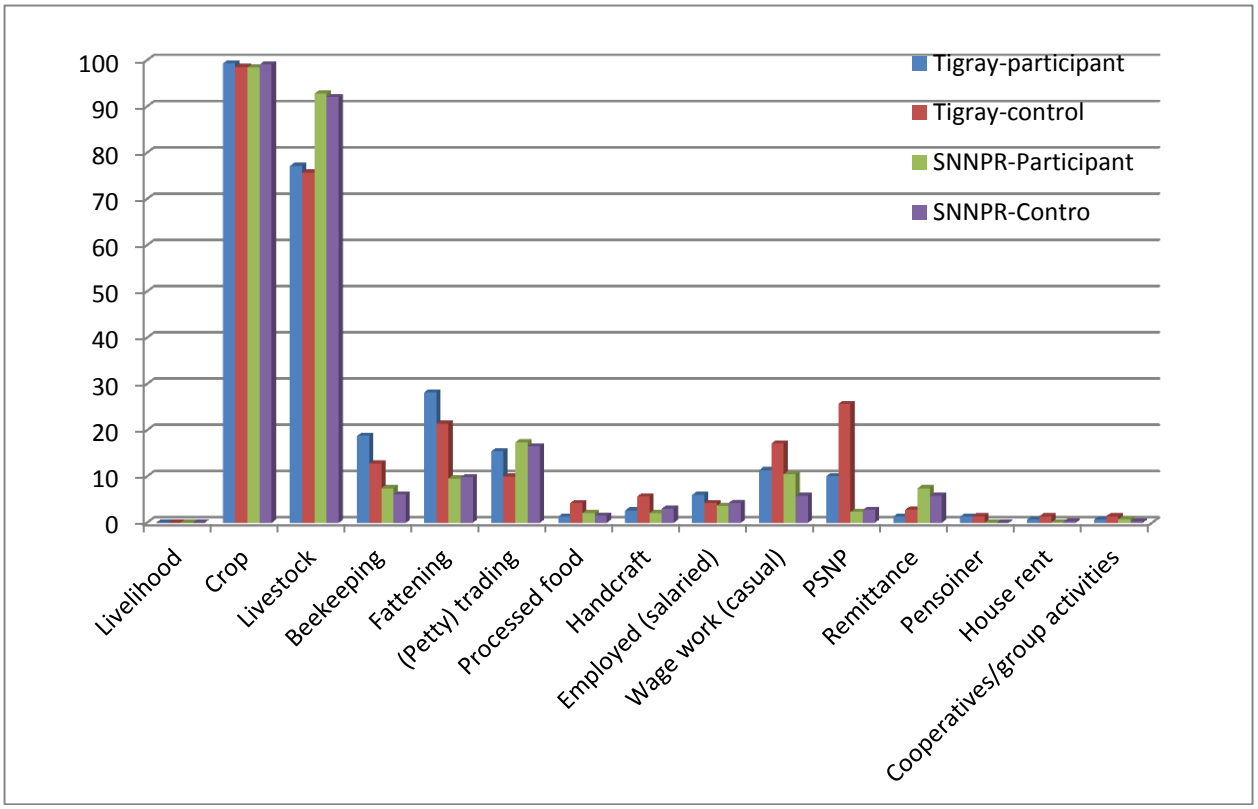

Figure A3.2: Distribution of households by source of livelihood (%)

Source: Own survey (August, 2014)

Table A3.6: Proportion of households ranking means of livelihood in Tigray (%)

No.	Livelihood	Total sample														
		Participant (N=149)					Control (N=70)					All cases (N=219)				
		1st	2nd	3rd	≥ 4th	Total	1st	2nd	3rd	≥ 4th	Total	1st	2nd	3rd	≥ 4th	Total
1	Crop production	92.6	4.7	1.3	0.7	99.3	88.6	8.6	0.0	1.4	98.6	91.3	5.9	0.9	0.9	99.1
2	Livestock production	0.7	58.4	15.4	2.7	77.2	0.0	48.6	24.3	2.9	75.7	0.5	55.3	18.3	2.7	76.7
3	Beekeeping	1.3	2.7	4.7	10.1	18.8	0.0	4.3	4.3	4.3	12.9	0.9	3.2	4.6	8.2	16.9
4	Livestock fattening	1.3	10.1	12.1	4.7	28.2	0.0	7.1	8.6	5.7	21.4	0.9	9.1	11.0	5.0	26.0
5	(Petty) trading	2.0	7.4	5.4	0.7	15.4	4.3	2.9	2.9	0.0	10.0	2.7	5.9	4.6	0.5	13.7
6	Selling processed food/drink	0.0	0.0	0.7	0.7	1.3	0.0	2.9	1.4	0.0	4.3	0.0	0.9	0.9	0.5	2.3
7	Handcraft (Carpentry, woodwork, metal work, etc)	0.7	0.7	0.7	0.7	2.7	0.0	2.9	1.4	1.4	5.7	0.5	1.4	0.9	0.9	3.7
8	Employed (salaried)	0.0	2.7	2.7	0.7	6.0	0.0	0.0	4.3	0.0	4.3	0.0	1.8	3.2	0.5	5.5
9	Wage work (casual)	2.0	4.0	4.0	1.3	11.4	2.9	8.6	5.7	0.0	17.1	2.3	5.5	4.6	0.9	13.2
10	PSNP	0.7	4.0	4.0	1.3	10.1	1.4	10.0	7.1	7.1	25.7	0.9	5.9	5.0	3.2	15.1
11	Remittance	0.0	0.0	0.7	0.7	1.3	1.4	0.0	1.4	0.0	2.9	0.5	0.0	0.9	0.5	1.8
12	Pensoiner	1.3	0.0	0.0	0.0	1.3	0.0	1.4	0.0	0.0	1.4	0.9	0.5	0.0	0.0	1.4
13	House rent	0.0	0.0	0.7	0.0	0.7	0.0	0.0	1.4	0.0	1.4	0.0	0.0	0.9	0.0	0.9
14	Cooperatives/group activities	0.0	0.7	0.0	0.0	0.7	0.0	1.4	0.0	0.0	1.4	0.0	0.9	0.0	0.0	0.9

Table A3.7: Proportion of households ranking means of livelihood in SNNPR (%)

No.	Livelihood	Total sample														
		Participant (N=763)					Control (N=326)					All cases (N=1089)				
		1st	2nd	3rd	≥ 4th	Total	1st	2nd	3rd	≥ 4th	Total	1st	2nd	3rd	≥ 4th	Total
1	Crop production	96.2	1.7	0.4	0.1	98.4	97.9	0.9	0.3	0.0	99.1	96.7	1.5	0.4	0.1	98.6
2	Livestock production	0.8	80.2	10.5	1.3	92.8	0.6	81.3	9.2	0.9	92.0	0.7	80.5	10.1	1.2	92.6
3	Beekeeping	0.7	0.3	3.4	3.1	7.5	0.3	0.6	2.8	2.5	6.1	0.6	0.4	3.2	2.9	7.1
4	Livestock fattening	0.4	1.4	6.0	1.7	9.6	0.0	0.9	6.1	2.8	9.8	0.3	1.3	6.1	2.0	9.6
5	(Petty) trading	1.0	6.4	6.8	3.1	17.4	0.6	5.5	8.0	2.5	16.6	0.9	6.2	7.2	2.9	17.2
6	Selling processed food/drink	0.1	0.7	0.9	0.4	2.1	0.0	0.0	1.2	0.3	1.5	0.1	0.5	1.0	0.4	1.9
7	Handcraft (Carpentry, woodwork, metal work, etc)	0.1	0.3	1.0	0.7	2.1	0.0	0.9	1.8	0.3	3.1	0.1	0.5	1.3	0.6	2.4
8	Employed (salaried)	0.0	1.8	1.4	0.4	3.7	0.6	1.5	1.8	0.3	4.3	0.2	1.7	1.6	0.4	3.9
9	Wage work (casual)	0.7	2.4	5.9	1.6	10.5	0.0	1.5	3.4	0.9	5.8	0.5	2.1	5.1	1.4	9.1
10	PSNP	0.0	0.1	1.4	0.8	2.4	0.0	0.6	1.8	0.3	2.8	0.0	0.3	1.6	0.6	2.5
11	Remittance	0.0	0.3	4.3	2.9	7.5	0.0	0.9	3.4	1.5	5.8	0.0	0.5	4.0	2.5	7.0
12	Pensoiner	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
13	House rent	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.1	0.1
14	From Cooperatives/group activities	0.0	0.1	0.4	0.3	0.8	0.0	0.0	0.3	0.0	0.3	0.0	0.1	0.4	0.2	0.6

Table A3.8: Proportion of households ranking means of livelihood, total sample (%)

No.	Livelihood	Total sample														
		Participant (N=912)					Control (N=396)					All cases (N=1308)				
		1st	2nd	3rd	≥ 4th	Total	1st	2nd	3rd	≥ 4th	Total	1st	2nd	3rd	≥ 4th	Total
1	Crop production	95.6	2.2	0.5	0.2	98.6	96.2	2.3	0.3	0.3	99.0	95.8	2.2	0.5	0.2	98.7
2	Livestock production	0.8	76.6	11.3	1.5	90.2	0.5	75.5	11.9	1.3	89.1	0.7	76.3	11.5	1.5	89.9
3	Beekeeping	0.8	0.7	3.6	4.3	9.3	0.3	1.3	3.0	2.8	7.3	0.6	0.8	3.4	3.8	8.7
4	Livestock fattening	0.5	2.9	7.0	2.2	12.6	0.0	2.0	6.6	3.3	11.9	0.4	2.6	6.9	2.5	12.4
5	(Petty) trading	1.2	6.6	6.6	2.7	17.1	1.3	5.1	7.1	2.0	15.4	1.2	6.1	6.7	2.5	16.6
6	Selling processed food/drink	0.1	0.5	0.9	0.4	2.0	0.0	0.5	1.3	0.3	2.0	0.1	0.5	1.0	0.4	2.0
7	Handcraft	0.2	0.3	1.0	0.7	2.2	0.0	1.3	1.8	0.5	3.5	0.2	0.6	1.2	0.6	2.6
8	Employed (salaried)	0.0	2.0	1.6	0.4	4.1	0.5	1.3	2.3	0.3	4.3	0.2	1.8	1.8	0.4	4.1
9	Wage work (casual)	0.9	2.6	5.6	1.5	10.6	0.5	2.8	3.8	0.8	7.8	0.8	2.7	5.0	1.3	9.8
10	PSNP	0.1	0.8	1.9	0.9	3.6	0.3	2.3	2.8	1.5	6.8	0.2	1.2	2.1	1.1	4.6
11	Remittance	0.0	0.2	3.7	2.5	6.5	0.3	0.8	3.0	1.3	5.3	0.1	0.4	3.5	2.1	6.1
12	Pension	0.2	0.0	0.0	0.0	0.2	0.0	0.3	0.3	0.0	0.5	0.2	0.1	0.1	0.0	0.3
13	House rent	0.0	0.0	0.1	0.1	0.2	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.2	0.1	0.2
14	Cooperatives/group activities	0.0	0.2	0.3	0.2	0.8	0.0	0.3	0.3	0.0	0.5	0.0	0.2	0.3	0.2	0.7

Table A3.9: Land holding size and land allocation by region (mean in ha)

Land use type	Tigray				SNNPR				Total sample			
	Participant (N=149)		Control (N=70)		Participant (N=763)		Control (N=326)		Participant (N=912)		Control (N=396)	
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Annual crops-Rainfed area	107	0.44	58	0.45	722	0.48	302	0.46	829	0.48	360	0.46
-Irrigated area	123	0.31	53	0.22	36	0.28	19	0.36	159	0.30	72	0.26
-Total area	143	0.60	66	0.57	727	0.49	310	0.47	870	0.51	376	0.49
Perennial crops-Rainfed area	24	0.02	10	0.10	740	0.24	311	0.26	764	0.23	321	0.25
-Irrigated area	37	0.06	8	0.05	17	0.25	11	0.41	54	0.12	19	0.26
-Total area	57	0.04	17	0.08	744	0.24	317	0.27	801	0.23	334	0.26
Forest/wood lots--Total area	95	0.08	41	0.07	511	0.13	208	0.12	606	0.12	249	0.11
Grazing/pasture area-Total area	45	0.05	17	0.06	455	0.18	179	0.18	500	0.17	196	0.17
Home stead-Rainfed area	10	0.02	7	0.05	535	0.15	215	0.13	545	0.15	222	0.12
-Irrigated area	10	0.09	6	0.01	17	0.11	3	0.08	27	0.10	9	0.04
-Total area	20	0.05	13	0.03	539	0.15	215	0.13	559	0.15	228	0.12
Total-Rainfed area	128	0.45	61	0.49	737	0.99	300	0.96	865	0.91	361	0.88
-Irrigated area	127	0.31	59	0.20	27	0.51	17	0.65	154	0.34	76	0.30
-Total area	145	0.67	68	0.62	756	0.99	322	0.93	901	0.94	390	0.87

Table A3.10: Proportion of farmers that have learned farming practices from the BPBL project

Practices learned	Tigray (N= 71)		SNNPR (N=461)		Total sample (N=532)	
	N	%	N	%	N	%
Land preparation	63	88.7	431	93.5	494	92.9
Seed rate/planting	60	84.5	450	97.6	510	95.9
Harvesting time/method	50	70.4	328	71.1	378	71.1
Cultivation and weeding)	49	69.0	379	82.2	428	80.5
Irrigation	39	54.9	88	19.1	127	23.9
Pest and disease management	20	28.2	134	29.1	154	28.9
Storage management		-	2	0.4	2	0.4
Chemical fertilizer application			9	2.0	9	1.7

Table A3.11: Proportion of farmers by source of credit (%)

Source of credit	Tigray			SNNPR			Total sample		
	Participant (N=75)	Control (N=36)	Total (N=111)	Participant (N=171)	Control (N=85)	Total (N=256)	Participant (N=246)	Control (N=121)	Total (N=367)
Neighbors	2.7	2.9	2.8	12.9	6.0	10.2	9.7	5.1	8.2
Cooperatives	26.0		17.6	21.5	20.5	20.3	22.9	14.4	20.1
Relatives				7.4	9.6	8.6	5.1	6.8	5.6
Saving and credit institutes	63.0	88.6	71.3	41.1	39.8	39.1	47.9	54.2	50.0
Individual	8.2	8.6	8.3	12.3	14.5	12.5	11.0	12.7	11.6
From Government				4.3	8.4	5.5	3.0	5.9	4.0
Idir				0.6	1.2	0.8	0.4	0.8	0.6

Table A3.12: Number of farmers reached through potato seed and sweet potato vines distribution

Means of targeting	**Male**	**Female**	**Total**	**Target**	**% achieved**	**Remark**
Potato						
Kebeles covered directly by BPBL	12,546	3,387	15,933			Verified
Kebeles outside the BPBL reached by agriculture office	49,039	14,494	78,694			Verified
NGOs (estimate)			**17,517**			
Farmer to farmer			**80,103**			
Total	**61,585**	**17,881**	**192,247**	**100,000**	**192**	95% without NGOs and farmer to farmer
Sweet potato						
Kebeles covered directly by BPBL	18,666	3,258	21,924			Verified
Kebeles outside the BPBL reached by agriculture office	32,520	5,120	37,640			Verified
NGOs (estimate)			**69,545**			
Farmer to farmer			**239,876**			
Total	**51,186**	**8,378**	**368,985**	**150,000**	**246**	40% without NGOs and farmer to farmer

Source: CIP-Addis Ababa Office (2014)

Table A3.13: Proportion of farmers growing different varieties of sweet potato (%)

Variety	Tigray		SNNPR		Total	
	Participant	Control	Participant	Control	Participant	Control
Gadisa	75.0	100	83.6	100.0	83.1	100.0
Koka 6	-	50			-	1.2
Guntute	8.3	25		1.2	0.5	1.2
Tulla	50.0				2.7	-
Kulfo			2.9		2.7	-
Hawassa 83			41.1	16.0	38.8	17.6
Beletech			1.4		1.4	-
Local seed			0.5	6.2	0.5	5.9
Elkeshe			0.5		0.5	-
Others			0.5		0.5	-
N	12	4	207	81	219	85

Table A3.14: Area allocated to local and improved varieties by region (ha/HH)

Crops	Tigray				SNNPR				Total			
	Belg		Mehar		Belg		Mehar		Belg		Mehar	
	Local	Improved	Local	Improved	Local	Improved	Local	Improved	Local	Improved	Local	Improved
Vegetables	0.17	0.14	0.10	0.09	0.08	0.07	0.06	0.08	0.09	0.09	0.06	0.08
Roots					0.16	0.18	0.13	0.17	0.16	0.18	0.13	
Other cereals	0.21		0.17			0.09	0.02		0.21	0.09	0.16	0.17
Legumes	0.18	0.18	0.16	0.22	0.15	0.17	0.11	0.13	0.15	0.17	0.12	0.14
Sweet potato	0.14	0.03		0.01	0.13	0.12	0.13	0.11	0.13	0.12	0.13	0.11
Potato		0.19	0.05	0.29	0.12	0.23	0.15	0.22	0.12	0.23	0.14	0.23
Teff	0.14	0.75	0.19	0.27	0.28	0.23	0.25	0.24	0.26	0.34	0.23	0.24
Wheat	0.17	0.18	0.24	0.27	0.23	0.08	0.17	0.26	0.18	0.15	0.20	0.26
Barely	0.21	0.26	0.32	0.34	0.17	0.17	0.18	0.19	0.20	0.20	0.23	0.20
Maize	0.15	0.19	0.15	0.14	0.19	0.26	0.17	0.28	0.18	0.26	0.16	0.27
Sourghum	0.10		0.10	0.13		0.12	0.10	0.15	0.10	0.12	0.10	
Oil seeds	0.13		0.07			1.00	0.04		0.13	1.00	0.06	0.14
Spices	0.08	0.03	0.06	0.06	0.14	0.25	0.19	0.13	0.09	0.14	0.18	0.11

Table A3.15: Proportion of farmers accessing seed from different sources (%)

Source of seedling	Potato varieties										Baseline
	Bulle	Jalane	Gudane	Wechacha	Guassa	Gera	Tocha	Local	Belete	Total	
Own seed	0.9	13.0	19.4	-	1.7	0.9	0.5	25.2	2.1	63.6	29
Free outside village	-	-	0.2	-	-	-	-	0.2	-	0.3	2
Bought neighbor	-	1.2	0.3	-	-	-	-	0.2	0.3	2.1	14
Bought cooperative	-	1.7	3.8	-	0.3	1.4	-	-	1.0	8.2	10
NGOs/Extension/ Research	-	9.3	14.6	-	0.3	0.3	-	0.3	1.9	26.8	24
Market	0.2	1.4	1.9	-	0.2	-	-	3.8	0.2	7.5	19
Borrowed neghbor	-	2.1	2.1	-	0.3	-	0.2	-	0.3	5.0	1
Seed grower farmers	-	0.3	0.9	-	-	-	-	-	0.3	1.5	
Private seed growers	0.5	23.0	30.0	0.2	1.0	0.7	0.5	0.3	5.1	61.4	
CIP	-	6.5	8.2	0.2	0.2	0.5	-	-	0.2	15.8	
Total	1.5	58.5	81.3	0.3	4.1	3.8	1.2	30.0	11.5		

Table A3.16: Proportion of farmers by potato variety source (%)

Source	Varieties of sweet potato									Total	Baseline
	Gadisa	Koka 6	Guntute	Tulla	Kulfo	Awasa 83	Beletech	Local seed	Elkeshe		
Own vines	25.7	0.4	-	-	0.4	3.5	-	3.5	-	33.5	65
Free from neighbors	1.8	-	-	-	-	-	-	0.4	-	2.1	12
Free outside village	-	-	-	-	-	-	-	0.4	-	0.4	7
Bought neighbor	2.1	-	-	-	-	-	-	-	-	2.1	
Bought cooperative	1.8	-	-	-	-	0.4	-	-	-	2.1	
NGOs/Extension/ Research	7.0	0.4	-	0.4	-	4.2	-	0.4	-	12.3	18
Market	4.9	-	-	-	-	0.7	-	0.7	-	6.3	9
Borrowed neghbor	0.4	-	-	-	-	-	-	-	-	0.4	
Seed grower farmers	0.4	-	-	-	-	-	-	-	-	0.4	
CIP	47.2	-	0.4	1.4	1.8	20.4	0.7	-	0.4	72.2	
Others	0.4	-	-	-	-	-	-	-	-	0.4	
Total	91.5	0.7	0.4	1.8	2.1	29.2	0.7	4.6	0.4		

Table A3.17: Proportion of farmers evaluating the suitability of potato varieties (%)

Variety	Higher yield			Disease resistance			Early maturity			Storability		
	Low	Moderate	Highly Satisfied	Low	Moderate	Highly Satisfied	Low	Moderate	Highly Satisfied	Low	Moderate	Highly Satisfied
Bulle	-	-	100.0	33.3	-	66.7	-	-	100.0	33.3	-	66.7
Jalane	0.4	2.8	96.8	6.7	8.5	84.8	3.2	9.9	86.9	9.2	5.7	85.2
Gudane	0.5	3.1	96.3	4.7	3.9	91.3	3.9	8.1	87.9	1.6	4.7	93.7
Wechacha	-	-	100.0	-	-	100.0	-	-	100.0	-	-	100.0
Guassa	22.2	11.1	66.7	11.1	11.1	77.8	11.1	11.1	77.8	-	22.2	77.8
Gera	-	11.5	88.5	11.5	19.2	69.2	-	15.4	84.6	-	15.4	84.6
Tocha	-	-	100.0	-	-	100.0	16.7	16.7	66.7	-	-	100.0
Local	50.0	8.3	41.7	50.0	8.3	41.7	25.0	41.7	33.3	50.0	8.3	41.7
Belete	1.6	3.2	95.2	6.3	4.8	88.9	3.2	9.5	87.3	8.2	13.1	78.7
Average	8.3	4.5	87.2	13.8	6.2	80.0	7.0	12.5	80.5	11.4	7.7	80.9

Table A3.17: Proportion of farmers evaluating suitability of potato varieties (continued)

Variety	High price			Cookability			Taste		
	Low	Moderate	Highly Satisfied	Low	Moderate	Highly Satisfied	Low	Moderate	Highly Satisfied
Bulle	-	33.3	66.7	33.3	-	66.7	33.3	33.3	33.3
Jalane	7.8	9.5	82.7	50.5	14.5	35.0	36.7	13.4	49.8
Gudane	1.8	5.2	92.9	63.4	9.4	27.2	35.6	10.7	53.7
Wechacha	-	-	100.0	100.0	-	-	100.0	-	-
Guassa	-	22.2	77.8	44.4	11.1	44.4	22.2	-	77.8
Gera	7.7	15.4	76.9	7.7	3.8	88.5	7.7	7.7	84.6
Tocha	-	16.7	83.3	66.7	16.7	16.7	50.0	16.7	33.3
Local	41.7	33.3	25.0	16.7	16.7	66.7	8.3	33.3	58.3
Belete	4.8	11.3	83.9	19.4	22.6	58.1	9.8	18.0	72.1
Average	7.1	16.3	76.6	44.7	10.5	44.8	33.8	14.8	51.4

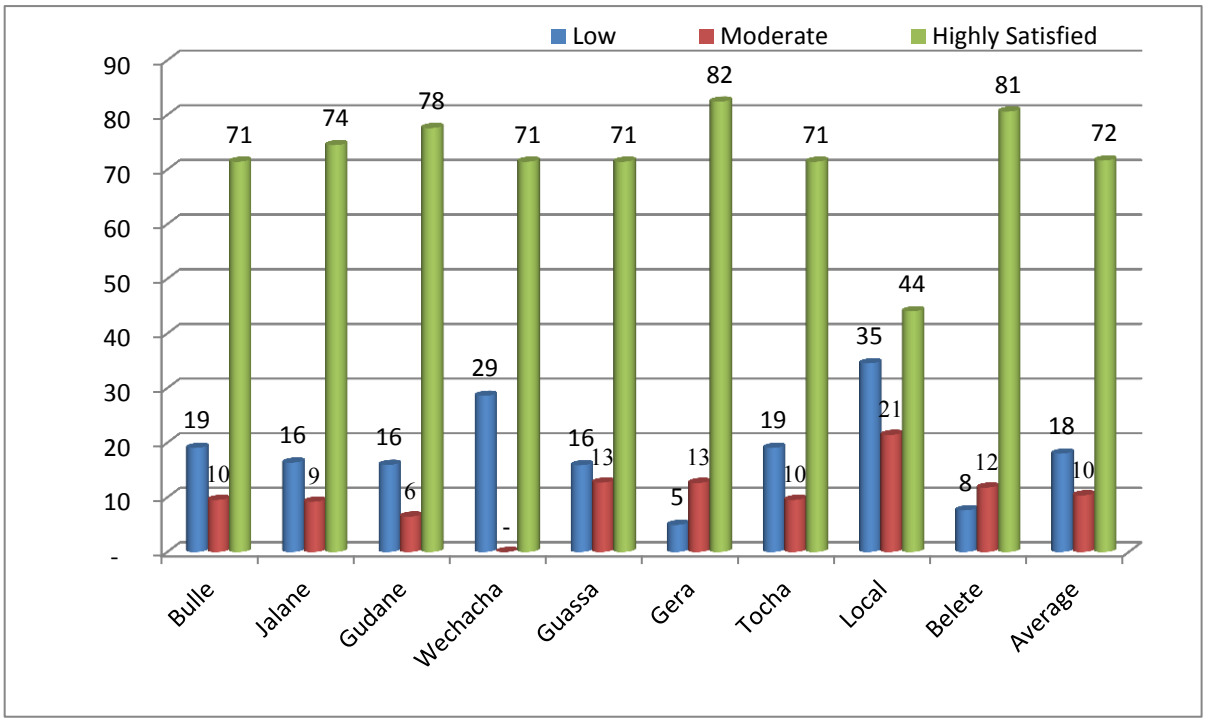

Figure A3.3: Proportion of farmers evaluating merits of varities of sweet potato

Table A3.18: Distribution of farmers by number of months of potato storage (%)

Months of potato storage	Ware potato		Seed potato	
	Belg	Meher	Belg	Meher
<1	5.6	2.4	1.4	3.1
1	2.5	8.5	1.4	5.8
2	4.7	8.0	2.8	6.3
3	9.0	10.4	4.9	5.8
4	22.0	16.0	15.6	18.8
5	15.0	15.1	16.5	16.8
6	25.1	22.6	29.4	26.7
7	7.4	7.5	13.1	8.9
8	7.9	9.4	11.4	5.8
9			0.8	1.0
10			0.7	0.5
12			2.1	0.5
Average	4.8	4.6	5.7	4.8
N	746	212	711	191

Table A3.19: Amount (average production in qt/HH) produced and sold in meher season by region

Crop	Tigray						SNNPR					
	Participant			Control			Participant			Control		
	Quantity produced	Quantity sold	% sales	Quantity produced	Quantity sold	% sales	Quantity produced	Quantity sold	% sales	Quantity produced	Quantity sold	% sales
Potato	22.20	13.24	59.6	3.10	1.85	59.7	32.7	10.23	31.3	21.1	1.59	7.5
Sweet potato	1.12	-	-	1.80	-	-	12.00	0.89	7.4	7.4	1.60	21.6
Maize	4.24	0.23	5.3	2.00	-	-	7.38	2.83	38.3	5.94	1.15	19.4
Barely	4.94	0.67	13.6	5.15	0.45	8.7	3.94	1.00	25.5	3.69	0.40	10.7
Wheat	5.42	0.61	11.2	5.20	0.72	13.8	6.82	2.57	37.6	3.73	0.68	18.2
Teff	2.02	0.01	0.5	2.50	0.20	8.0	2.09	0.69	32.9	2.63	1.02	38.8
Other cereals	6.19	0.53	15.8	4	-	-	4.06	0.57	15.8	1.13	-	-
Legumes	2.26	0.54	23.8	1.15	0.37	32.5	1.88	0.50	26.6	1.96	0.34	17.2
Vegetables	33.87	32.01	94.5	3.88	1.79	46.2	5.31	2.33	43.8	4.43	1.16	26.2
Other roots	-	-	-	-	-	-	9.72	2.52	25.9	10.42	2.77	26.5
Spices	4.50	4.00	88.9	1.00	1.00	100.0	10.93	9.29	85.0	6.50	4.60	70.8
Oil seeds	0.72	-	-	1.00	0.70	70.0	0.13	-	-	0.25	-	-

Table A3.20: Amount (average production in qt/HH) produced and sold in belg season by region

Crop	Tigray						SNNPR					
	Participant			Control			Participant			Control		
	Quantity produced	Quantity sold	% sales	Quantity produced	Quantity sold	% sales	Quantity produced	Quantity sold	% sales	Quantity produced	Quantity sold	% sales
Potato	16.9	11.7	69.5	2.9	2.4	80.9	17.0	11.0	64.7	16.7	6.3	37.7
Sweet potato	4.8	4.4	91.1	1.3	0.6	44.0	7.0	6.0	86.3	5.2	2.9	56.5
Maize	4.7	2.5	52.3	5.0	4.3	86.3	5.8	5.1	87.3	6.7		
Barely	3.6	3.2	88.4	4.6	0.8	16.1	13.0	12.8	98.5	2.3		0.0
Wheat	2.7	1.3	46.0	2.0	0.7	32.0	1.7	1.0	58.0	2.5		0.0
Teff	4.4		0.0				7.9	1.2	15.3	2.5	1.0	40.4
Sourghum	3.5	1.0	28.6	8.0	2.0	25.0	6.7		0.0			
Other cereals	1.5		0.0	2.3		0.0						
Legumes	2.5	1.9	76.9	1.6	0.9	56.7	2.3	2.0	88.9	1.9	1.6	85.4
Vegetables	24.6	24.6	99.8	5.8	4.8	81.7	4.9	4.4	90.8	4.0	3.4	84.5
Roots							11.8	5.2	44.0	12.6	12.0	95.2
Spices	4.3	3.9	91.3	1.8	1.3	76.2	4.0	4.0	100.0	4.0	3.7	91.9
Oil seeds	0.5		0.0				3.0		0.0	4.0		0.0

Table A3.21: Average income from different sources by project participation and gender (Birr/HH)

	Tigray						SNNPR						Total					
	Participant			Control			Participants			Control			Participants			Control		
Source of income	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Annual crops	26986	17623	26307	13878	8128	13284	13857	8721	13030	9111	6583	8697	16254	9463	15262	9932	6752	9442
Perennial crops	1832	590	1743	3609	1500	3433	5171	3287	4862	5420	2258	4882	5029	3241	4742	5343	2244	4827
Livestock	9124	8852	9098	7915	3703	7223	5351	4037	5151	5191	3925	4990	6048	4591	5841	5710	3881	5418
Other livelihood sources	8645	4717	8380	7173	5009	6783	4053	5608	4361	5057	5890	5225	5106	5537	5180	5628	5676	5637
Total (weighted)	39770	22914	38186	25401	12371	23354	23922	16625	22690	20164	14170	19147	26719	17245	25236	21106	13870	19894

Table A3.22: Households that earned income from different sources (%)

Source of income	Tigray						SNNPR						Total					
	Participants			Control			Participants			Control			Participants			Control		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Annual crops	94.8	71.4	92.6	88.1	54.5	82.9	91.0	85.9	90.1	92.9	89.1	92.3	91.6	84.5	90.5	92.1	83.3	90.6
Perennial crops	19.3	14.3	18.8	18.6	9.1	17.1	92.9	89.8	92.3	92.6	92.7	92.6	79.9	82.4	80.3	79.3	78.8	79.2
Livestock	93.3	92.9	93.3	94.9	100.0	95.7	88.3	78.1	86.5	88.5	81.8	87.3	89.2	79.6	87.7	89.6	84.8	88.8
Other livelihood sources	61.5	42.9	59.7	69.5	81.8	71.4	44.3	53.9	45.9	41.3	50.9	42.9	47.3	52.8	48.2	46.3	56.1	48.0
Total (%)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
N	135	14	149	59	11	70	634	129	763	269	57	326	769	143	912	328	68	396

Table A3.23: Average cash income from different sources by project participation and gender (Birr/HH)

Source of income	Tigray						SNNPR						Total					
	Participants			Control			Participants			Control			Participants			Control		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Annual crops	11711	5264	11271	3484	2644	3371	6005	3036	5596	3403	2697	3301	7225	3283	6737	3417	2688	3313
Perennial crops	1832	590	1743	3609	1500	3433	5171	3287	4862	5420	2258	4882	5029	3241	4742	5343	2244	4827
Livestock	7961	8654	8023	7192	2985	6469	4853	3667	4672	4698	3613	4524	5428	4221	5257	5173	3485	4899
Other livelihood sources	8645	4717	8380	7173	5009	6783	4053	5608	4361	5057	5890	5225	5106	5537	5180	5628	5676	5637
Total	22425	12531	21489	14250	8422	13320	14571	10245	13839	13128	9192	12453	15952	10470	15091	13329	9064	12607

Table A3. 24: Frequency of HHs perceived number of food secure months by region (%)

Months of food security	Tigray						SNNPR					
	Before project			After project			Before project			After project		
	Participant	Control	Total	Participant	Control	Total	Participant	Control	Total	Participant	Control	Total
2	1.4	3.4	2.0	0.7	5.7	2.3	6.9	6.2	6.7	0.1	0.0	0.1
3	6.1	3.4	5.4	0.7	1.4	0.9	11.6	7.4	10.5	0.0	0.0	0.0
4	8.2	12.1	9.3	0.7	8.6	3.2	11.0	6.6	9.9	0.1	0.0	0.1
5	10.2	6.9	9.3	0.0	1.4	0.5	6.5	7.0	6.6	0.4	0.6	0.5
6	29.3	31.0	29.8	13.5	15.7	14.2	16.9	16.3	16.7	1.6	3.1	2.0
7	5.4	6.9	5.9	5.4	7.1	6.0	7.0	7.8	7.2	0.9	3.4	1.7
8	19.0	10.3	16.6	16.2	14.3	15.6	11.5	17.1	12.9	4.1	7.4	5.1
9	4.1	0.0	2.9	7.4	4.3	6.4	4.2	5.8	4.6	4.7	5.8	5.1
10	4.8	13.8	7.3	16.2	12.9	15.1	5.7	3.5	5.1	6.3	7.4	6.6
11	0.7	0.0	0.5	1.4	1.4	1.4	0.9	0.0	0.7	2.8	0.9	2.2
12	10.9	12.1	11.2	37.8	27.1	34.4	17.8	22.5	19.0	79.0	71.4	76.7
<12	89.1	87.9	88.8	62.2	72.9	65.6	82.2	77.5	81.0	21.0	28.6	23.3
N	147	58	205	148	70	218	757	258	1015	763	325	1088

Table A3.25: Frequency of HHs perceived number of food secure months, total sample (%)

Months of food security	Before project			After project		
	Participant	Control	Total	Participant	Control	Total
2	6.0	5.7	5.9	0.2	1.0	0.5
3	10.7	6.6	9.7	0.1	0.3	0.2
4	10.5	7.6	9.8	0.2	1.5	0.6
5	7.1	7.0	7.0	0.3	0.8	0.5
6	18.9	19.0	18.9	3.5	5.3	4.1
7	6.7	7.6	7.0	1.6	4.1	2.4
8	12.7	15.8	13.5	6.0	8.6	6.8
9	4.2	4.7	4.3	5.2	5.6	5.3
10	5.5	5.4	5.5	7.9	8.4	8.0
11	0.9	0.0	0.7	2.5	1.0	2.1
12	16.7	20.6	17.7	72.3	63.5	69.7
<12	**83.3**	**79.4**	**82.3**	**27.7**	**36.5**	**30.3**
N	904	316	1220	911	395	1306

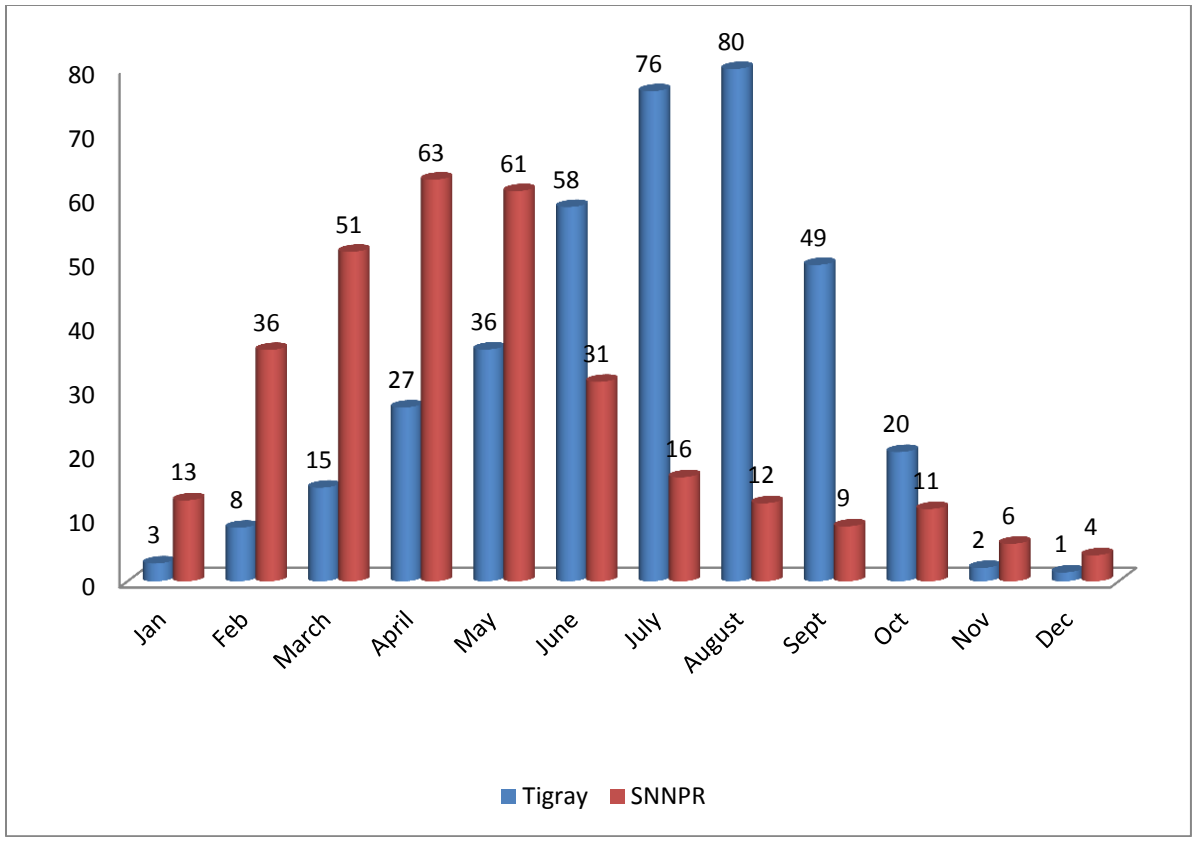

Figure A3.4: Proportion of households indicating food gap in stated months (%)

Table A3:26: Average food consumption score at HH level by food category

Food items	Tigray		SNNPR		Total sample					
					Participants		Control		Total	
	Participants	Control	Participants	Control	N	Mean	N	Mean	N	Mean
Maize , maize porridge, rice, sorghum, millet pasta, bread & enset	11.9	12.1	8.3	8.4	770	9.0	335	9.1	1105	9.0
Cassava, potatoes and sweet potatoes	4.8	5.1	10.8	10.1	733	10.2	323	9.5	1056	10.0
Beans. Peas, groundnuts and cashew nuts	17.1	17.2	6.6	6.9	434	10.1	204	10.4	638	10.2
Vegetables and leaves	2.6	2.8	3.6	3.6	817	3.4	355	3.5	1172	3.4
Fruits	4.8	4.8	2.5	2.9	178	3.1	74	3.4	252	3.2
Beef, goat, poultry, pork, eggs and fish	2.3	2.5	6.0	5.4	257	5.3	98	4.6	355	5.1
Milk yogurt and other diary	3.5	1.3	12.3	13.3	517	11.4	204	12.4	721	11.7
Oils, fats and butter	3.2	3.2	1.8	1.9	779	2.1	339	2.1	1118	2.1

Table A3.27: Average food consumption score for children 6-59 months age by food category

Food items	Tigray		SNNPR		Total sample					
					Participants		Control		Total	
	Participants	Control	Participants	Control	N	Mean	N	Mean	N	Mean
Maize , maize porridge, rice, sorghum, millet pasta, bread & enset	6.7	6.3	3.5	3.2	770	4.1	335	3.8	1105	4.0
Cassava, potatoes and sweet potatoes	2.8	2.0	4.1	3.4	733	4.0	323	3.2	1056	3.7
Beans. Peas, groundnuts and cashew nuts	8.7	8.4	2.1	1.4	434	4.3	204	3.8	638	4.2
Vegetables and leaves	1.3	1.3	1.3	1.1	817	1.3	355	1.1	1172	1.2
Fruits	3.0	3.1	1.2	1.4	178	1.7	74	1.9	252	1.7
Beef, goat, poultry, pork, eggs and fish	8.9	10.5	4.3	4.7	257	5.1	98	6.2	355	5.4
Milk yogurt and other diary	17.6	19.3	7.1	6.0	517	8.2	204	7.0	721	7.9
Oils, fats and butter	1.7	1.5	0.7	0.7	779	0.9	339	0.9	1118	0.9

Table A3.28: Descriptive statistics of FCS at HH level

Participation type	N	Minimum	Maximum	Mean	Std. Deviation
Total sample*	1302	5.0	90.5	34.1	14.69
Participant	908	5.0	90.5	34.1	14.79
Control	394	5.5	86.5	34.0	14.47
Tigray**	218	8.5	82.5	39.7	11.25
Participant	148	8.5	82.5	39.6	11.67
Control	70	16.5	68.5	39.9	10.39
SNNPR	1,084	5.0	90.5	33.0	15.04
Participant	760	5.0	90.5	33.1	15.10
Control	324	5.5	86.5	32.8	14.93

* No statistical difference at 10% between control and participants
** There is statistical difference in FCS in Tigray and SNNPR at 1% level

Table A3.29: Descriptive Statistics of FCS of children 6-59 months

Participation type	N	Minimum	Maximum	Mean	Std. Deviation
Total sample*	536	5.5	110.5	39.4	19.22
Participant	387	5.5	105.5	39.3	18.93
Control	149	6.0	110.5	39.7	20.00
Tigray**	121	13.0	110.5	51.7	21.20
Participant	85	13.0	105.5	51.3	20.67
Control	36	20.5	110.5	52.9	22.67
SNNPR	415	5.5	89.5	35.8	17.02
Participant	302	5.5	85.5	36.0	16.99
Control	113	6.0	89.5	35.5	17.15

* No statistical difference at 10% between control and participants
** There is statistical difference in FCS in Tigray and SNNPR at 1% level

Table A3.30: Proportion of HHs that consumed food items during last 24 hrs (%)

	Tigray		SNNPR		Total sample					
					Participants		Control		Total	
Food items	Participants	Control	Participants	Control	N	%	N	%	N	%
Maize , maize porridge, rice, sorghum, millet pasta, bread etc.	87.9	84.3	71.7	72.1	678	74.3	294	74.2	972	74.3
Cassava, potatoes and sweet potatoes	22.1	25.7	76.4	71.8	616	67.5	252	63.6	868	66.4
Beans. Peas, groundnuts and cashew nuts	91.9	87.1	19.0	20.6	282	30.9	128	32.3	410	31.3
Vegetables and leaves	45.0	45.7	73.3	74.8	626	68.6	276	69.7	902	69.0
Fruits	22.8	18.6	7.9	6.4	94	10.3	34	8.6	128	9.8
Beef, goat, poultry, pork, eggs and fish	4.0	11.4	10.4	7.7	85	9.3	33	8.3	118	9.0
Milk yogurt and other diary	9.4	5.7	43.4	41.7	345	37.8	140	35.4	485	37.1
Oils, fats and butter	91.9	91.4	65.9	62.6	640	70.2	268	67.7	908	69.4
Total N	149	70	763	326	912	100.0	396	100.0	1308	100

Table A3.31: HHs that fed different food items to children 6-23 months during past 24 hrs (%)

Food items	Tigray		SNNPR		Total sample					
					Participants		Control		Total	
	Participants	Control	Participants	Control	N	%	N	%	N	%
Maize , maize porridge, rice, sorghum, millet pasta, bread	100.0	77.8	69.3	63.0	119	78.8	36	65.5	155	75.2
Cassava, potatoes and sweet potatoes	29.7	11.1	60.5	60.9	80	53.0	29	52.7	109	52.9
Beans. Peas, groundnuts and cashew nuts	81.1	55.6	4.4	8.7	35	23.2	9	16.4	44	21.4
Vegetables and leaves	43.2	22.2	45.6	43.5	68	45.0	22	40.0	90	43.7
Fruits	21.6	22.2	7.9	8.7	17	11.3	6	10.9	23	11.2
Beef, goat, poultry, pork, eggs and fish	32.4	44.4	25.4	28.3	41	27.2	17	30.9	58	28.2
Milk yogurt and other diary	56.8	22.2	62.3	58.7	92	60.9	29	52.7	121	58.7
Oil, fat and butter	81.1	55.6	52.6	58.7	90	59.6	32	58.2	122	59.2
Total N	37	9	114	46	151	100.0	55	100.0	206	100.0

Table A2.32: HHs that fed different food items to pregnant or lactating women during last 24 hrs (%)

Food items	Tigray		SNNPR		Total sample					
					Participants		Control		Total	
	Participants	Control	Participants	Control	N	%	N	%	N	%
Maize , maize porridge, rice, sorghum, millet pasta, bread, etc	78.9	100.0	74.1	78.4	191	75.2	75	75.0	266	75.1
Cassava, potatoes and sweet potatoes	15.8	23.5	69.0	77.0	145	57.1	61	61.0	206	58.2
Beans, peas, groundnuts and cashew nuts	75.4	88.2	14.7	17.6	72	28.3	28	28.0	100	28.2
Vegetables and leaves	38.6	47.1	64.5	74.3	149	58.7	63	63.0	212	59.9
Fruits	10.5	11.8	9.1	5.4	24	9.4	6	6.0	30	8.5
Beef, goat, poultry, pork, eggs and fish	3.5	5.9	8.6	13.5	19	7.5	11	11.0	30	8.5
Milk yogurt and other diary	7.0	-	39.6	48.6	82	32.3	36	36.0	118	33.3
Oils, fats and butter	73.7	100.0	61.4	73.0	163	64.2	71	71.0	234	66.1
Total N	57	26	197	74	254	100.0	100	100.0	354	100.0

Source: Own survey (August 2014)

Table A3.33: Number of persons trained on different topics from year 1-4

Reporting period	Area of training/topic	# of trainees			Remark
		Male	Female	Total	NB
Oct, 2010 to March 2011	Seed Production, management and post-harvest techniques	328	29	357	Farmers
	Potato production and utilization	182	26	208	
	TOT on Seed Production, management and post-harvest techniques	84	6	89	Trainers
	TOT on Potato production and utilization	41	4	45	
	TOT -DLS construction	9	0	9	
April to Sep, 2011	Potato agronomy, protection and post-harvest handling	626	196	822	Farmers
	Seed and ware potato production	435	76	511	
	SP agronomy management practices	3060	284	3344	
	TOT on potato agronomy, protection and post-harvest handling and DLS construction	81	7	88	Trainers
	Methods of sweet potato production & multiplication, how to prepare cuttings of sweet potato, land preparation for sweet potato planting, fertilizer and compost application	23	4	27	
	Production of orange fleshed sweet potato and how to establish and maintain clean sweet potato planting material	17	3	20	
	Sweet potato vine and root production and use	42	2	44	
April to Sep, 2012	Agronomic practices, pest and diseases control, postharvest handling and DLS construction	4309	920	5229	Farmers
	Handling of seed potato in the DLS and grading	96	8	104	
	Farmer-to-farmer extension approach and seed &	21	2	23	
	QDPM inspection, agronomic practice, disease, pest and postharvest management	34	7	41	
	SP Agronomic practices, pest and diseases control and postharvest handling	3194	1854	5048	
	SP vine multiplication and conservation techniques, disease and pests, nutritional value of OFSP roots	150	50	200	
	Model farmers -SP production and vine multiplication, pest control and postharvest handling	10	5	15	
	Potato seed production & seed quality maintenance and post-harvest handlings	411	80	491	Trainers
	Refresher course trainers on P production and utilization	40	5	45	
	QDPM inspection with major stakeholders, sensitization and training for inspectors	405	83	488	
	SP production, vine multiplication and post-harvest management techniques	280	41	321	
0ct, 2012to march , 2013	Agronomic practices, major pest and diseases control, post-harvest handling	651	131	782	Farmers
	Refresher training on seed and ware potato production techniques, major potato disease and pests and control, measures, post-harvest handling methods, seed inspection and quality control methods	119	31	150	
	Seed potato production, crop protection/ post-harvest and ling and storage	458	114	572	
	Modern technique of clean potato seed & ware production, disease control and post-harvest handling.	126	13	139	

Reporting period	*Area of training/topic*	*# of trainees*			*Remark*
		Male	**Female**	**Total**	**NB**
	Training on DLS and ware potato store construction for 5days in Atsbi Woreda	37	1	38	
	Agronomic practices of sweet potato/ production and management	3936	977	4913	
	Experience sharing on seed potato production & storage and linking seed & ware producers and other partners	1003	340	1343	
	Farmers' field day organized to show best practices of sweet potato	15	50	65	Farmers/ partners
	TOT- Seed potato production, protection and post-harvest handling	10	1	11	
	TOT- Sweet potato vine multiplication	8	1	9	
	TOT -Sweet potato production and management	38	6	44	Trainers
April to sep. 2013	Agronomic practices, major pest and diseases control, post-harvest handling and DLS construction of potato	911	221	1132	
	Refreshment training for existing seed multipliers on seed potato production techniques and post-harvest handlings	286	54	340	
	Entrepreneurship training to members of seed multipliers	16	20	40	
	Experience sharing visit has been organized so as to share the knowledge, take lesson from fruitful farmers and introduce technology for participants	71	7	78	
	Agronomic practices of sweet potato	909	456	1365	Farmer
	Refreshment TOT training on seed and ware potato production and post-harvest	50	18	68	Trainers
Oct, 2013 - march, 2014	Seed potato production management, preparation of business plan and how to create market linkage	125	30	155	
	Business skill and management training to cooperative members	146	58	204	
	potato management, disease and insect pest protection, grading of seed potato, yield estimation of potato and methods of DLS construction	288	20	308	Farmers
	Potato production refreshment to FGCs	119	48	167	
	Recipe preparation from potato	61	62	123	
	Experience sharing on seed potato production	665	208	873	
	Sweet Potato Vine multiplication and planting techniques	1360	480	1840	
	Management and Business Skill Development Training	128	92	220	Cooperatives managers & experts
	Total	**25,414**	**7,131**	**32,548**	

Table A3.34: Persons participated in Special events/ Sensitization workshops, experience sharing and Field days organized by BPBL.

S.No	Types of events	Persons Participated			Remarks
		Male	Femal	Total	
1	Sensitization workshop on QDPM with major stakeholders and inspectors	405	83	488	Representatives of different stakeholder institutions, sector office heads, woreda Experts, DAs, selected coops managers, inspectors from Coops, and Model farmers were participated in these different occasions.
2	Experience sharing on seed potato production & storage and linking for seed & ware potato producers and other partners	1003	340	1343	
3	Farmers' field days organized to show best practices of sweet potato	15	50	65	
4	Experience sharing visit has been organized so as to share the knowledge, take lesson from fruitful farmers and introduce technology for participants	71	7	78	
5	Experience sharing on seed potato production	665	208	873	
	Total	**2,159**	**688**	**2,847**	

Source: CIP progress reports