

# FINAL REPORT

## COMMERCIAL ALLIANCE FOR SMALLHOLDER HORTICULTURE PROJECT (CASH-P)

February 2016



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## 1.0 BACKGROUND

This report presents results, lessons learnt and recommendations for activities undertaken by ASNAPP under the Commercial Alliance for Smallholder Horticulture Project (CASH-P) which commenced on October 1, 2014 and is expected to be completed by December 15, 2015.

CASH-P is aimed at enhancing the livelihood opportunities of about 880 smallholder farmers in the adjoining communities near the Kpong Dam and 70 farmers at Atomic Energy Environs (BNARI Land Vegetable Growers And Marketing Cooperative Society) and promoting the production of high quality vegetables for increased income.

MiDA developed a 450 ha irrigation scheme at Torgorme in the North Tongu District (Kpong Left Bank Irrigation Project-KLBIP), adjacent to the Kpong Dam within the Accra Plains as part of the Millennium Challenge Account Program (MCA) Compact signed with the Government of Ghana (GoG). This was facilitated by ACDI/VOCA, the parent company of Agribusiness System International (ASI), the contractor and beneficiary communities. Export Development and Agricultural Investment Fund (EDAIF) provided additional funding to complete the project and trained beneficiaries on the use of the facility to compliment the work of MiDA. To anchor the project, ACDI/VOCA developed the “anchor investor concept” and facilitated the acquisition of 1,070 Hectares of land adjacent to the scheme for Vegpro Group (off-taker) as an anchor investor to provide technical and market access for the smallholder farmers participating in the scheme.

Atomic Energy Commission has an institute, Biotechnology and Nuclear Agriculture Research Institute (BNARI), responsible for providing solutions to challenges in agriculture, health and industry through exploration and exploitation of scientific knowledge in biotechnology and nuclear science. The Institute has over 100 acres of lands, portions of which are used to undertake agricultural research. In order to secure the un-cropped portions from encroachers and to boost urban production of vegetables, BNARI has leased close to 90 acres of land to seventy-five (75) smallholder vegetable producers.

Following a visit to Torgorme by ICCO as part of its support to the vegetable sector in Ghana, ASNAPP, supported by ASI, was tasked to develop a proposal that will be funded for a one year period to facilitate the inclusion of small holders in the scheme to open up economic and market opportunities as well as build up their technical and managerial skills to effectively compete. This was to build on the initial investment in hard infrastructure, irrigation facility, developed in Torgorme coupled with the possibility of stimulating investment in vegetable production leading to increased income for smallholders, increasing food security and improving nutrition at the community level. Agribusiness in Sustainable Natural African Plant Products (ASNAPP) is a value chain facilitation NGO with extensive expertise in the agribusiness sector in Africa and ASI provides tailored services to firms, investors and entities that support the agribusiness sector to create increasingly competitive and dynamic industries.



### **1.1 Key Activities expected to be completed by Year One (1)**

- Develop common pool resource models for the management of a smallholder centre pivot irrigation scheme as a tool for irrigation revolution in Ghana.
- Train farmers to use centre pivot system to produce vegetables
- Train farmers to use intensive production methods and technologies to produce high quality specialty vegetables enhancing productivity, quality and incomes.
- Develop financial and technical management system for the sustained inclusion of small holders in the commercial horticultural sector
- Link TAGFU/Atomic farmers Association to private companies like Vegpro Group and Agri-Impact who are willing to integrate backwards
- Provide technical and market access to small-scale suppliers and facilitate value chain development
- Develop a model ownership structure and governance system and support TAGFU to operationalize the system
- Create opportunities for youth and women to participate significantly in horticultural value chains

### **1.2 Expected Outputs**

- 60 farmers trained and operating a 60ha Centre Pivot irrigation system
- 250 Torgorme farmers trained and 110 farmers producing high quality fresh vegetables under intensive production technology supplying Agri-Impact
- 250 Torgorme farmers trained and 150 farmers producing and supplying vegetables to VEGPRO
- Suitable ownership model for centre pivot irrigation pilot-tested and Governance and Management system of TAGFU strengthened
- 70 Atomic farmers trained in Intensive vegetable Production Technologies to produce high quality vegetables for the market

## 2.0 ACTIVITIES UNDERTAKEN

### 2.1 Inception and Partners Meeting

As part of key programmes and activities to be implemented, an inception meeting was organized for Program/Project officers of ASNAPP and ASI at the office of ASNAPP Ghana. The inception meeting afforded partners the opportunity to familiarize with project objectives, expected outcomes and clarify roles. CASH Project Implementation team was also established with representation from the two organizations. At the meeting, ASI briefed ASNAPP on the project status and the various bottlenecks hindering the full utilization of the developed KLBIP irrigation facility. Follow-up meetings were held at ASI and ASNAPP offices to finalize the MOU between the two organizations and to agree reporting format and guidelines. ASNAPP was however solely responsible for the BNARI Land Vegetable Growers And Marketing Cooperative Society located at Atomic Energy Commission.

An 8-member implementation team has been set up to provide guidance for project roll out with six sited close to the beneficiaries to help provide on- ground, day-to-day support.

#	Name	Role
1	Larry Amekuse	Project Leader
2	Satch Avudzi	Assistant Project Leader
3	Prince Manu-Yeboah	Project Officer
4	Eunice Adrakpanya	Project Officer
5	David Badasu	Project Officer
6	Emmanuel Braimah	Project Officer
7	Phyllis Ohui Ofoe	Project Officer
8	Timothy Gyan	Project Officer

### 2.2 Stakeholder Consultations

The project team organized a stakeholders' meeting to get the buy-in of key actors involved in the construction and operationalization of the KLBIP at Akuse as well as Officers at Atomic Energy Commission. The consultations were held at two levels. These were;

#### ***Apex Body Akuse Project***

Present at the meeting were EDAIF, Scheme Management Entity (SME), TACFU executives, Offtakers (Vegpro and AIC), Engineers that constructed the Dam and the Irrigation Development Authority (IDA). Issues discussed centered on;

- The leveling of the lands as it was undulating and was prone to flooding
- Conspicuous cracks developed along the primary canal
- The flow of water through the canal to commence production
- The role of the SME

- The meeting brought to fore the teething problems and outlined steps to addressing these to ensure immediate utilization of the facility.

### **Atomic Energy Commission**

ASNAPP also held an inception meeting with Staff of BNARI to formalise the rules of engagement, identify particular needs that the project will address and provide clarity on the role of each partner.

### **Beneficiary Communities**

ASNAPP together with ASI held broad consultations with beneficiaries of the CASH project in their respective communities. The project team interacted with Esko Duloorlonyo, Esko Nusedodo, Agbelengor, Wordenenyo, Lebene, Norvisi Yingor, Lorloronyo, Dogbeda, Elemawusi and Evado FBO's from Akuse and the Atomic Vegetable farmers and discussed CASH Project in line with its objectives, proposed activities, roles and responsibilities of project stakeholders.



**Figure 1: Consultative meeting with beneficiary communities**

### **Outcome of the Deliberations**

- Akuse Producers decided to follow up with the management of Irrigation scheme and secure suitable parcels of lands and developed them to grow and supply VEGPRO and AIC
- Atomic Producers want to be assisted to invest in good nurseries and also indicated their willingness to apply improved technologies to produce high quality vegetables for the domestic and export markets.

## 2.3 Sensitization and Baseline Data collection

The project team organized sensitization programmes in adjoining communities on the commencement of CASH-P by visiting all 16 FBOs (Akuse & Atomic) and introduced them to the economic benefit of participating in the project. Opportunity was also taken to outline the expectations, roles and responsibilities of all parties and comments and inputs invited from farmers in project design and rollout. A rapid survey was also undertaken targeting 10% of the FBO members (95) to gather baseline information on current production, marketing, income and demographic profile of project beneficiaries. The data is being analyzed and subsequent report put together to assist project stakeholders measure the impact of the project.

### 2.3.1 Output

Results from the study revealed that an average age of **48 years** for the beneficiary farmers with **79%** being in the active age group (**between 18 and 60 years**). The massive involvement of the economically active population in subsistence agriculture defeats the idea of agriculture as business but rather only as a source of food for household consumption.

Fifty-Three percent (**53%**) had attained at least their basic level education (Primary & MLS/JHS). However, significant number of respondents (**29%**) had never had any formal education. This indicates high level of illiteracy in the project catchment areas.

Additionally, the survey revealed that **86%** of the respondents engaged in farming as their major occupation and the remaining **24%** being involved in commerce (trade), artisanry and public service sectors.

On the average, farmers at Torgome catchment area earn an annual net income of **GH¢477** and **GH¢344** for the major and minor season respectively amounting to **GH¢2.8/day** during the major season and **GH¢1.6/day** during the minor season. On the other hand, farmers at Atomic-Haatso catchment area earn annual net income of **GH¢2,059** and **GH¢1,089** for the major and minor season respectively amounting to **GH¢11.3/day** during the major season and **GH¢5.9/day** for the minor season for a household of 4 members. The discrepancies in the incomes levels for the two (2) catchment areas is as a result of the fact that farmers at Atomic are fully engaged in vegetable production which has short production cycle. Additionally, farmers are also able to cultivate a number of vegetables concurrently contributing quick turnover, reflection in the annual net profit income coupled with higher priced vegetables for producing within the city (consumers). However, farmers at Torgome are mostly engaged in other food crops particularly maize and cassava that has longer maturity period and therefore account for their relatively low annual net profit income levels. They are also an hour drive from the main capital city and therefore priced lower for vegetables compared to Atomic Producers.

From the ninety-one (91) farmers interviewed, **27%** indicated that their major challenge was financial support followed by flooding (**20%**) and irrigation (**12%**) issues. The perennial flooding was a challenge at the Torgome area and was due to the poor nature of the landscape of the area. (*Full Baseline Report Available*)

## 2.4 Capacity Development Program

Realizing the importance of sustained capacity building in the adoption of Good Agricultural/Business Practices, it was made a key component of the CASH Project.

### 2.4.1 Development and Printing of Training Materials

ASNAPP developed and printed over 400 copies of training materials comprising of four training modules on GAP for the capacity development program. ASNAPP relied on the expertise of its partners and network of experts from research institutions around the globe to gather technical agronomic information for the development of the posters. The experts were drawn from Rutgers University (USA), Stellenbosch University (South Africa) and KNUST (Ghana). The materials covered Intensive vegetable production for Sweet pepper, Tomato and Chilies. In order to ensure smooth transfer and assimilation of improved technology and best practices by producers who have low formal educational training, simple/illustrated production guides were developed. The guides demonstrated Do's and Don'ts on intensive vegetable production with the **Bad Practices** boldly marked as wrong in **red color** and the **Good Practices** boldly marked as Correct in **green color**. Copies were made available to all participating farmer trainees at the end of the modular programme. Training materials on Business Development Skills covering record keeping, Costing & Pricing, Selling & Marketing and Working Capital Management have also been developed and 400 copies printed.

ASI together with VEGPRO completed and printed training materials on practical agronomic training on production of three export vegetables; baby corn, bird's eye chilies and butternut squash. Additionally, ASI has developed training manual on Business, Financial and Management skills. Various feedbacks have been received from the FBOs during initial training for finalization and printing. Training materials on Governance and Management Systems as well as Financial and Business training for the strengthening of TACFU executives has been developed.

### Output

- Four Training Modules developed for farmers
- Printed 400 copies each of training manuals on Intensive Vegetable Production (Sweet pepper, Tomato and Chilies) and farming as a Business
- Printed 250 Copies each of training manuals on baby corn, bird's eye chilies and butternut squash
- 400 Copies of Business training manuals developed and printed for Atomic and Akuse producers
- Producers at Atomic were also supplied with previously 50 onion posters to improve upon their ongoing production



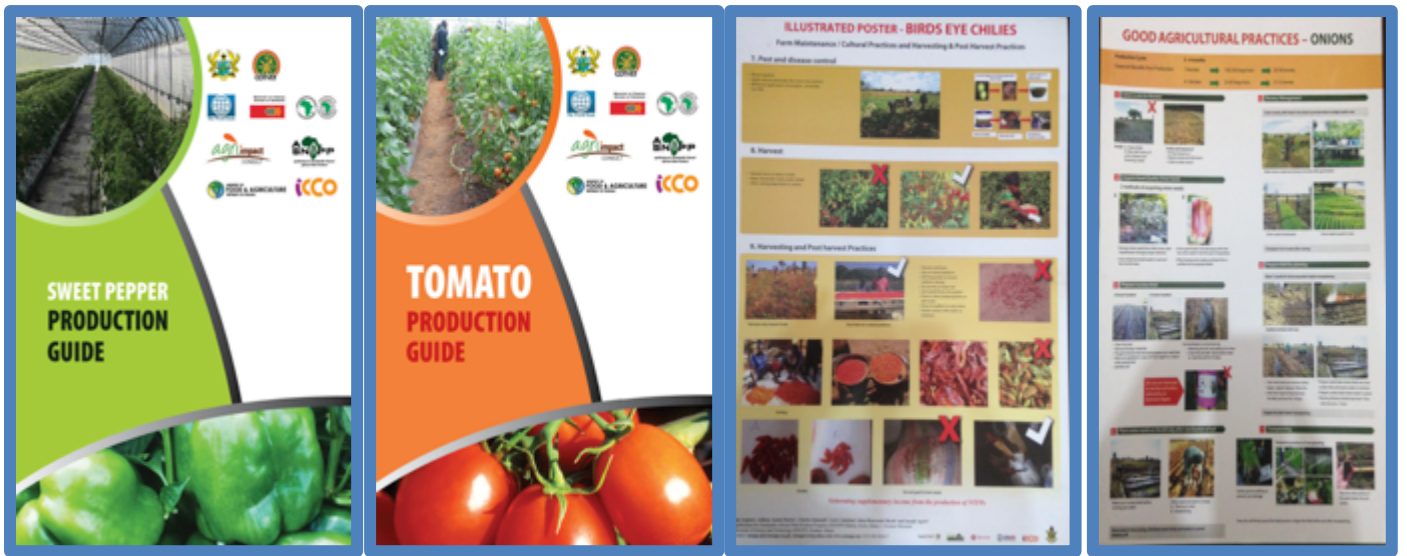


Figure 2: GAP Training Manuals



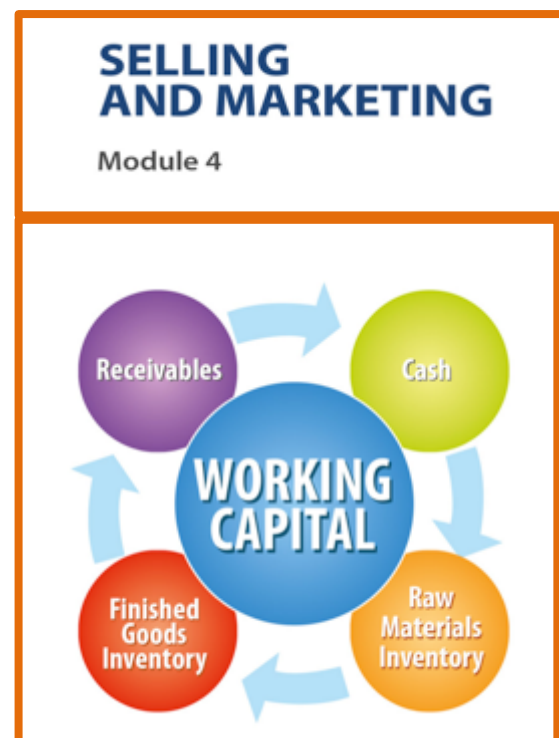
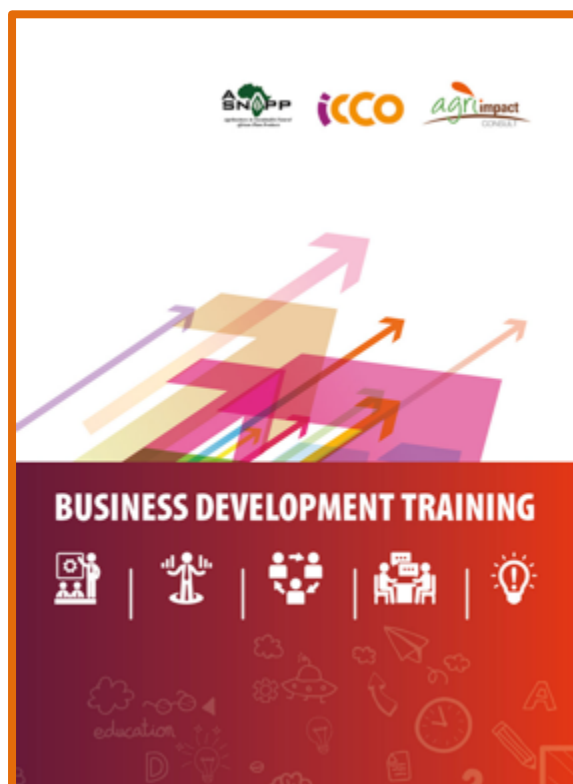
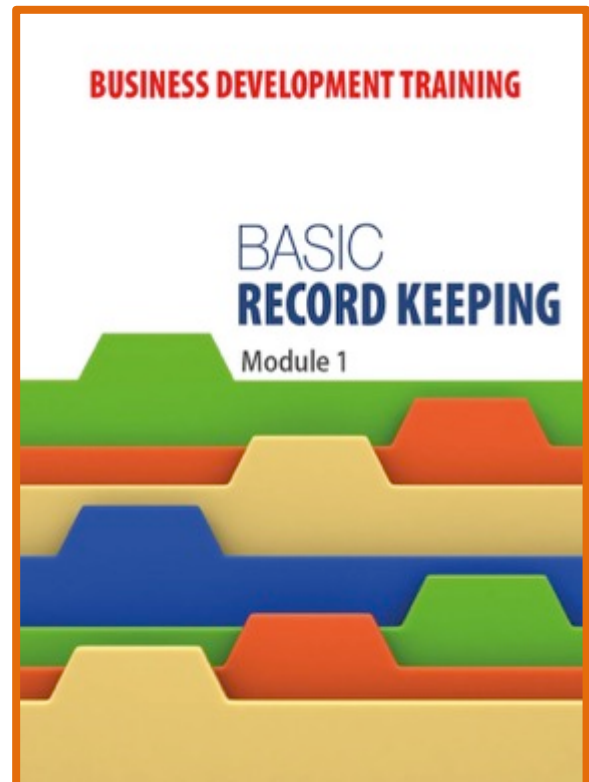


Figure 3: BDS Training Manuals

## 2.4.2 Farmer Exchange

As part of efforts to ensure the buy-in of farmers, ASNAPP organized a farmer's exchange at Agri-Impact Entrepreneurship and Technology Institute (AIETI) at Berekuso in the Eastern region for 16 selected members (Akuse & Atomic) from the beneficiary FBOs. The exchange was organized to expose the business side of the project to the farmers, stress the high quality standards expected from production and to enable farmers conceptualize the project and to buttress the productivity benefits of growing in tunnel/greenhouse structures.

### Production Activities at AIETI



Figure 4: Production in the Tunnel

Producers were exposed to the intensive production technologies such as

- Growing in soilless mediums
- Mediums sterilization
- Fertigation
- Trellising



Figure 5: Farmers Interacting with Technical Officers

It was an eye opener for many as most of them were seeing this for the first time. An interesting spectacle that characterized the short exchange was the enthusiasm with which the participants purchased all the harvested tomato fruits, as they were amazed with the fruit size, colour and taste. The farmers purchased the tomatoes harvested at \$1.60/kg (only 5-6 fruits), compared to the \$1/kg prevailing market price, due to the high quality of produce.

### 2.4.3 Capacity Strengthening for Smallholder Producers (Agronomic & Post Harvest Training)

Targeted, hands-on, practical training and development for producers is fundamental for ensuring high produce quality. This was therefore made a key component of this programme with the objective of building the capacity of 575 producers.

#### Approach

The training programme for the producers was designed into four modules with each lasting for three days. Farmers who participate in all four modules are expected to significantly improve their production practices, obtain better yields and produce high quality vegetables suitable for the high-end market. Each module is composed of theory (interactive), exercises and hands-on field activity. To determine the effectiveness of the training, participants were assessed on the various topics after the end of every session. Day 3 of each module was mostly devoted for field activities where they were taken through practical sessions to throw more light on what was taught in class (theory). Evaluation of the entire training is conducted at the end of each module. Observations, lessons learnt and suggestions were also noted for improvement.

**Table 1: Indicating Modular training programme for project beneficiaries**

DAY	MODULE 1	MODULE 2	MODULE 3	MODULE 4
DAY 1	Starting the Farm Business School	Transplanting	Integrated Pest Management	Marketing I
		Irrigation Management	Harvest & Post Harvest Practices	Marketing II
DAY 2	Pre-Production	Fertigation	Developing a business Plan	Leadership & Entrepreneurship I
	Plant Propagation	Crop Husbandry	Record Keeping	Leadership & Entrepreneurship II
DAY 3	Discussion, Observations & Assessment	Discussion, Observations & Assessment	Discussion, Observations & Assessment	Discussion, Observations & Assessment

There was a blend of both classroom and practical approaches to enhance effective transfer of information, improved technologies and provide a friendly and interactive environment for producers to engage in discussions, questions and exchange of ideas. The project team used the services of Interpreters to ensure language was not a barrier to effective knowledge transfer. Participants were also allowed some time for questions and answers after every session/presentation. Participants were encouraged to use the language they were most comfortable with to communicate or make their inputs during discussions.



#### 2.4.4 Practical Sessions

##### Seeds nursing

As part of module 2, farmers were taken through practical sessions on nursing of seeds, seedlings care and good nursery management practices. Facilitators taught participants the importance of healthy seedlings and its significance on production.

The farmers were provided with improved tomato and sweet pepper seeds from ProSeeds, South Africa, to nurse according to their subgroupings using nursery trays and sterilized rice husk medium.



Figure 6: Farmers nursing seeds

##### Soil/Medium Sterilization

The farmers were taken through practical sessions on soil & medium sterilization. This module also focused on demonstrating simple low-cost and environmentally friendly technologies that minimize diseases thereby increasing yields. Two types of sterilization were discussed; Sterilization by steam and solar (Solarization). However, farmers were taken through sterilization by means of steam. Sterilization by steam involves treating soil or medium with steam at high temperatures for over 6 hours to eliminate soil-borne disease causing organisms. Producers had the opportunity to experiment and use the steam treated soil to nurse seedlings for transplanting under module.

##### Compost Preparation

Farmers were taken through composting as a technique used to accelerate the natural decay process. The technique converts plant material/animal waste/kitchen waste to decomposed organic matter which is used to fertilize and condition soil to improve upon the soil structure. A well prepared compost is dark



Figure 7: Composting and Sterilization

brown, crumbly, and has an earthy odor. Participants were made to understand that, depending on seasonal temperatures, a well-built, well-tended pile generally yields finished compost in 10 to 12 weeks. Materials used for the composting were rice husk, saw dust and chicken manure in a proportion of 2:2:1 and could easily be adopted by farmers during their own production. Emphases were made on the need for the compost to be protected from direct sunlight, rainfall and runoff so as to reduce volatilization and leaching of nutrients. The material must remain moist at all times to avoid slowing down decomposition and hindering the efficiency of the micro and macro-organisms involved in decomposition.

**Output**

- i. 6 FBOs (Akuse and Atomic) comprising Elemawusi, Lorldoronyo, Evado, Dogbeda, Norvisi and Atomic within the catchment area benefitted from the training programme.
- ii. A total of **385** farmers have successfully completed all four modules of intensive vegetable production training programme, which includes Good Agricultural Practices and Good Harvesting and Post Harvest Handling Practices while 70 Atomic farmers are yet to complete all four modules.
- iii. On average, **45%** female participated in the training as indicated in the Fig 4

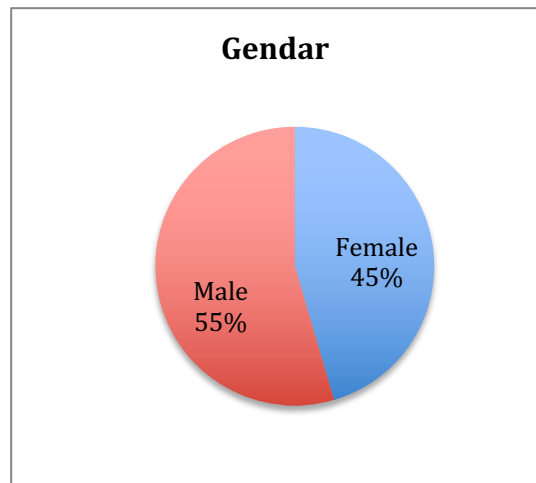


Figure 8: Gender Ratio



Figure 9: Classroom Training Sessions at Akuse



Figure 10: Training Sessions at Atomic

- iv. As a result of these training sessions about 60% of the farmers at Atomic have had a mind change about the use of seed trays due to the excellent surviving rate as compared to the seeds nursed on beds (90-98% germination for the seed tray nursery and 40% seed germination for the seeds nursed on the beds). The Atomic farmers were also introduced to the open field tomato seeds (Qwanto) being produced at Akuse during the training session. Based on the desirable characteristics, about 3,000 seeds have been purchased and nursed by the farmers.
- v. As part of our strategy for linking producers to Agro-input dealers which directly affects the sustainability of the project, ASNAPP introduced the Atomic farmers to **Bayer company** and its distributors (**Wienco**) in Ghana. Technical officers from Bayer trained farmers on the management of Pest and Diseases (Cabbage & Lettuce), right application of fungicides and introduced farmers to their new products that had curative properties. Bayer Company help set up two demonstration farms on farmers plot to demonstrate the efficacy of the new products introduced (fungicides). Additionally, **Ecoman Biotech** company was also present to train farmers on the right application of agrochemicals. This was as a result of the continuous complains about the effectiveness of agrochemicals from Ecoman Biotech.





Figure 11: Training by Agro-Input Dealers

#### 2.4.5 Capacity Strengthening for Smallholder Producers (Management, Financial & Business Training)

ASI adopted interactive and participatory approach, sought the knowledge and practices of participants (farmers) to know the level of their understanding in the subject matter before they were taught simple but comprehensive financial models and concepts which is geared towards improving their farming business activities.

Among the topics covered during training included: traits of successful farmers and tasks and skills associated with farming; capital resources required for farming;

**Marketing** – with emphasis on marketing channels, product differentiation and competitive advantage, defining the characteristics of the market and social responsibility of farming; production timing, budget and value chain services;

**Farm business decisions** – covering human resources, business risk management, government support programs, local farm networks and exchanges, cooperatives and their functions, were also covered.

**How to develop a farm enterprise plan**, including marketing plan, production plan, financial plan (income statement, cash flow analysis, balance sheet & source and use funds) and an exit plan were also covered.

Additionally, ASNAPP designed and printed Business manuals with four modules that focused on Record Keeping, Pricing & Costing, Selling & Marketing and Working Capital Management for training producers directly managed by ASNAPP. Lessons were shared amongst the team members to ensure content was adequate and similar.



Figure 12: Farmers Interacting with Technical Officers

## Output

- i. 6 FBOs assigned to Vegpro as well as Center Pivot out-growers participated in the training programme.
- ii. A total of **213** direct ASNAPP assisted beneficiaries (**76** males & **137** females) are benefiting from the ongoing BDS trainings
- iii. A total of **172 ASI** assisted farmers who comprise of **137** farmers; 84 females and **53** males from the 5 FBOs and **35** Center Pivot out-growers (members of Evame Vegetable Growers Association); **15** females and **20** males also attended. The table below provides a breakdown in the attendance.

Table 2: Breakdown of Participants

No.	Responsible Institution	FBO/Group Name	Community	Total Attendance	Disaggregation	
					Female	Male
1	ASNAPP	EVADO	TORGORME	35	11	24
2		DOGBEDA		31	17	14
3		LORLORNYO		40	21	19
4		ELEMAWUSI	FODZOKU	29	10	19
5		NORVISI		26	16	10
6		ATOMIC FARMERS	ACCRA	52	1	51
7	ASI	LEBENE	GBTEKPO	33	11	12
8		DULORLORNYO	SOKOPE	24	18	6
9		NUSEDODO		35	15	20
10		AGBELENGOR	AZAGONORKOPE	20	14	6
11		WORDENENYO		25	16	9
12		CENTER PIVOT OUT-GROWERS	From selected comm	35	15	20
				<b>385</b>	<b>165</b>	<b>210</b>



Figure 13: Awareness Creation and Baseline Data Collection

#### 2.4.6 Capacity building of TACFU Executives

Training under this module (Governance, Leadership, Management Systems & Financial Training) has been completed with coaching and mentoring ongoing. **64 (45 males and 19 females)** executives of the 15 TACFU member FBOs as well as the 7 TACFU executives participated in the training. The number of participants exceeded the projected target of 50 executives. The number was increased as a result of TACFU's request that at least four out of the seven executives of each FBO is trained under this module. Feedback received from the training was incorporated into the manuals and printed.

These feedbacks include narrated experiences of the executives, questions asked and scenarios created during the training sessions.

*The manual focused on topics such as principles of cooperative management; elements of cooperatives and division of responsibilities, resources to manage (people, capital and facilities); management functions (planning, organizing, motivating and controlling); management tools (accounting system, control reports, security and safety, training and evaluation, incentive programming, communication, strategic planning, etc.*

*Other topics covered include how to manage local operations such as marketing and determining market potentials, supply, tractor and trucking services, membership agreements, storage and warehousing, managing inventories, providing current information to producers, controlling credit and establishing credit ratings of members and buyers. Furthermore, establishing distribution networks, how to manage operations that have large scale centralized associations, federated associations or direct farmer membership cooperatives were also covered. Management practices covered under this include how to establish line and staff departments, developing team management, establishing fair operating policies, communication with large number of members, meeting requirements of Government agencies, etc.*



## 2.5 Demonstration Site For Greenhouse And Open Field Production

As part of the project design, ASNAPP was expected to establish demonstration site made up of three (3) greenhouse structures and open field for intensive production of various high value vegetables. It is to serve as a training centre for farmers to gain practical know-how on improved farming practices.

### 2.5.1 Site Selection, Greenhouse and Open Field Setup

In line with preparatory works towards the establishment of the demonstration site, a team of experts paid working visits to the project area to undertake feasibility studies by identifying the best location to install the Greenhouse structures, appropriate site for open field production as well as access to source of water to support production trials. The technical team made up of agronomists, irrigation experts and soil scientists selected an appropriate site based on their experience and expertise. A two (2) acre land was selected near a secondary canal for initial production setup. Soil samples and other propagation media were taken to test for the presence of soil borne diseases and other pathogens that could hamper production. Construction was done after the assessments and requisite materials procured.



Figure 14: Greenhouse Construction at Akuse



Figure 15: Greenhouse Structure at Atomic



Figure 16: Setting up Open Field for Production



### 2.5.2 Nursery Establishment at Akuse

High quality planting materials is a critical initial investment, key component and a starting point for successful production of high quality vegetables. The first step in successful vegetable production is to raise healthy vigorous seedlings. Seedlings require a lot of care particularly during the early stages of growth and therefore have to be protected from adverse temperatures, heavy rains, drought, wind and a variety of pests and diseases. ASNAPP constructed 6m x 4m net house structure as a place where seedlings would be catered for during the early stages of growth, providing optimum conditions for germination and subsequent growth, until they were strong enough to be transplanted into the greenhouse structures or the open field.



Figure 17: Nursery

Till date, **58,050** seedlings of tomatoes, chilies, carrots, lettuce and sweet paper have been raised from the nursery. About 41,200 out of this number have been transplanted at the ASNAPP demonstration sites.

### 2.5.3 Nursery at Atomic

Similarly, a nursery structure (wooden 8m x 12m) to serve the farmers and the Greenhouse structure has also been constructed at Atomic. The structure is used to raise seedlings for use in the greenhouse and farmers open field. Due to the size, farmers nurse in turns and augment supply from temporary nurseries structures constructed. Ten (10) farmers nursed cabbage, Tomatoes, lettuce and pepper in the structure with the remaining farmers in mini shades that were harvested for the Christmas and New Year demand for vegetables.





## Output

- i. **310sq.m** and **210sq.m** greenhouse structures established at Akuse
- ii. **210sq.m** greenhouse structures established at Atomic
- iii. **1½ acre** open field intensive production still under cultivation
- iv. **8m x 12m** net-house nursery and **300sq.m** greenhouse structures under construction at Atomic to raise high quality seedling for producers
- v. **6m x 4m** net-house nursery structure constructed at Akuse to raise seedling for production
- vi. **8m x 12m** net-house nursery structure constructed at Atomic to raise seedling for production
- vii. Currently, **58,050 seedlings** have been raised at the Akuse nursery and about **120,500** raised by farmers at Atomic either in their temporary or constructed structure

### 2.5.4 Production at Demo and Farmers Sites

#### Akuse – AIC out growers

Production of various vegetables is underway at the ASNAPP Demo site using different growing media (River Sand, Cocopeat, Rice husk and decomposed manure) that is locally sourced as well as imported. The greenhouse structures have tomatoes and sweet pepper planted in it with tomato, chilies, sweet corn, lettuce and carrot cultivated on the open field. Production at the site was staggered to ensure regular supply to new and growing markets. To this end, different lines of the vegetables (both in the Greenhouse and Open field) are at different stages of production with varying harvesting dates and period. Interested farmers have bought into the idea of dry season production and they are producing ¼ to ½ acre of farmland to meet the high prices for period. The exciting performance of the introduced varieties and the appropriate use of agrochemicals in terms of yield and shelf life of fruits is drawing more farmers and passersby to learn and buy seeds on their farms or backyard gardens. Farmers who partook in the demonstration on their own plots continue to sell their produce to AIC, as and when produce becomes matured.



Figure 18: Farmers Fields and supply of seedlings

### Innovation

ASNAPP is championing innovation (city vegetable garden) in agriculture by using simple materials. This is focused on using of PVC pipes as medium holding materials to grow shallow rooted leafy vegetables (lettuce). With this innovation farmers can still grow these vegetables in their homes as supplementary foods to enrich their meals and also people in the urban areas can also adopted it in their homes. The materials are easy and cheap to obtain.



Farmers are excited about this are trying exploring ways of using bamboo instead of PVC to achieve same results.



## Greenhouse Production



Figure 19: Greenhouse Production Pictures



## ASNAPP Open Field Production



Figure 20: Vegetables in the open field at the Demo site

## Farmers' Fields



Figure 21:  
Farm Visits





### VEGPRO Outgrowers

ASI facilitated series of activities and meetings and coordinated with the 250 out-growers assigned to Vegpro in order to attain some production goals. Field visits, inspections, and checks were conducted on the irrigation channels for commencement of production activities. Farmers' fields were clearly identified and relevant allocations made. Lebene Farmers Association (31 females; 23 males) from Gbetekpo (one of the 5FBOs/250 out-growers assigned to Vegpro) has been supported by one 'midsize farmer' to produce exportable vegetables. Contracts for this engagement were signed and land preparation completed in June of last year. Production delayed with just a few farmers starting the cultivation of some vegetables in the second week of December. 20 acres were under cultivation between Nusedodo and Dulorlornyo (6 acres) of Sokope and Lebene (14 acres) of Gbetekpo Lebene is currently working as an out-grower for Joekopan). Wordenenyo and Agbelengor are also scheduled to commence production on a 6 acre field by 1st week of February 2016.



The support provided include; pumping machines and drip lines to raise water from the main canals for irrigation, technical/production extension support, production inputs and land preparation support as well as post-harvest and market access support.





### Atomic out-growers

Most producers at Atomic are already producing despite the challenges they are experiencing, Notable challenges they are faced with include poor quality of agrochemicals, seeds/seedlings and the presence of soil borne diseases. Over the period, the farmers have produced cabbage (15 acres), onion (5 acres), lettuce (10 acres) and pepper (8 acres). ASNAPP is providing extension support to improve upon the yields and produce quality. ASNAPP has facilitated the introduction of resistant varieties of tomato and chilies as add-ons that are demanded by the high-end markets.



Figure 22: Atomic Farmers' Field



Figure 23: Training/Harvesting of Onions by Atomic Farmers



Vegetables traded from intervention areas till date presented below;

#	Vegetables	Quantity harvested and Sold (kgs)
1	Tomatoes	1250
2	Chilies	1580
3	Sweet Pepper	1,090
4	Onion	45,000
5	Cabbage	119,700
6	Lettuce	19,760
7	Green Pepper	36,480
<b>TOTAL</b>		<b>224,860.00</b>



### 2.5.5 Pivot Irrigation System

The Pivot Irrigation system has been installed, test-run and ready for use. Seventy-five farmers (31 females, 44 males) were selected from the entire 15 FBOs as beneficiaries of the center pivot scheme.

The farmers were oriented and trained on the ownership and management system for the center pivot system as well as the technical agronomic rudiments required for production activities and commercial success of the scheme. The farmers are receiving other trainings in Business, Financial, Governance and Management Systems.



Under the Pivot irrigation system, sixty (60) producers have been selected and a site selected for production. One pivot irrigation system has been installed with the capacity of irrigating 64ha of land. Production is yet to commence on that as the schedule is demand based which is influenced by the Buyer (Vegpro).

## 2.6 Marketing



Realizing the importance of access to market as a key driving force in the continuous production of vegetables in the enclave, the project design included off-takers in the implementation and production planning. Product mobilization is one of the biggest bottlenecks for producers and large buyers. With increasing fuel prices, poor rural road networks, dispersed nature of smallholder producers coupled with small supply volumes, establishment of efficient mobilization system will be paramount to this programme. The concentration of farmers in the project enclaves has facilitated the aggregation and marketing of produce thus far supplied. It has made it easy to take buyers to the doorstep of farmers and to foster interactions that have clarified expectations and

responsibilities of both parties. To date, over 70% of produce harvested have meet high buyer standards and supplies have been delivered to major vegetable wholesale outlets like Freshmark, Eden Tree, Alisa Hotel, Fiesta Hotel and Melcom. As part of market segmentation farmers have now started marketing the rejected produce (does not meet the standard of the high end market) to local markets (food sellers and market women).

### Output

#### Sales

#	Vegetables	Quantity harvested and Sold (kgs)	Value (\$)
<b>Direct Sales</b>			
1	Tomatoes	1250	2,986.70



2	Chilies	1580	630.90
3	Sweet Pepper	1,090	980.70
4	Onion	45,000	500
5	Cabbage	119,700	55,416.67
6	Lettuce	19,760	31,666.67
7	Green Pepper	36,480	76,000.00
			<b>\$207,746.71</b>
Indirect sales			
	From Product aggregation		<b>\$95,000</b>
			<b>\$302,746.71</b>

NB: Yields from 20 acres Okro already cultivated and additional 10 yet to be cultivated is expected to generate a gross revenue of about **\$82,000**

#### ***Estimated Revenue per farmer per season***

Selected farmers interviewed showed that producers at Atomic earned about \$3,600 per acre for cabbage and \$2,200 for lettuce per production while their compatriots from Akuse earned a little over \$ 500 for the ½ or ¼ acre sized farms they worked on.

#### **Website Development**

As part of measures to promote the agribusinesses opportunities of the SME's and small scale farmers, ASNAPP has contracted Ozyplus media to develop, register and host a website for a year for the two producing communities. Management cost will later be transferred to the groups after the first to promote their produce. The site is under development but with a registered Domain name of [www.cashprojectghana.com](http://www.cashprojectghana.com).

## From Production to Marketing



Figure 24: Production to Marketing

## 2.7 Resourcing of TACFU Office

The TACTU office is fully furnished with all office equipment, ranging from desktop computer, laptop, printer/photocopier, desks and chairs, office cabinet, visitors chairs, internet router, extension cords among other office supplies which were procured. The lease agreement has been obtained for the office space. All required renovations have been completed for the use of the office by executives of TACFU. Database system for capturing relevant data on TACFU activities is has been developed.



## 2.8 Business and 5 Years Strategic Plan

Business plan and strategy document has been prepared to help aid and guide TACFU's production and business activities. TACFU executives were consulted for their input and position on the content of the plan. TACFU and its member Cooperatives/Farmer Based Organizations with this document will be able to reach out to financial institutions, lending and donor agencies for loans and grants to undertake and expand their production and marketing activities. The plan provide clear background to TACFU, its ownership, core values, vision and mission statements; a brief overview of the vegetable agribusiness sector in Ghana and likely products/vegetables to be produced. Promotion/advertising, sales, pricing and marketing strategy; market segmentation and analysis were also included. A SWOT analysis; personnel plan; financial requirements and plan; break-even analysis; sales forecast; projected cash flow and management structure were also covered in the plan.

The plan is also directly developed to request for a grant assistance of up to **GH¢ 2,858,000** from benevolent industry stakeholders for TACFU to procure equipment, inputs and other services (water pumping machines, on-field sheds, seeds and agrochemicals, delivery van, motorbikes, tractors, etc.) for its 887 members to undertake large scale commercial production on its 350 hectares allocated lands on the Torgorme/Kpong Left Bank Irrigation



Project site. ASI has recently facilitated contact with institutions such as Export Trade Agriculture and Industrial Development Fund (EDAIF) and Ghanaman Trust Fund for financial support to the groups.

## **2.9 Database System Development, Training and Data Capturing**

Multiple excel templates were developed for TACFU's data collection, maintenance and administration activities. The templates were of two categories. One for individual on-field production/post-harvest handling, marketing and other related activities records; and the second category for collating group-level records on each TACFU member. Records at this level will be collated on FBO by FBO basis and managed by the TACFU office. The TACFU Office Manager will be responsible and ensure that individuals comply with the record keeping standards and meet all relevant data integrity requirements. The TACFU office will continue to monitor, guide and train the individual TACFU members on these processes and ensure that records from the individuals are duly captured into the main TACFU database system at the end of each production cycle.

An office manager has been trained and taken through all the relevant routines to ensure that the data collection activities, maintenance and administration are smoothly carried out and sustained. The designed/developed templates include record forms for production activities related records, harvesting records, scouting and farm maintenance records, fertilizer application, socio-economic profile records, irrigation service charge records, dues collection records, inputs, credits and repayment records, etc.

## **3.0 INSTITUTIONAL ORGANISATIONAL AND PARTNERSHIP DEVELOPMENTS**

- i. Efforts have been made to get the buy-in of Ghana Irrigation Development Authority (GIDA) and BNARI. GIDA executives have assured implementing partners of providing technical support in water management and the operations of the canals in the interim until a Scheme Management Entity (SME) is finally put in place. This was after series of meetings with all stakeholders including the farmer's union, TACFU executives, Project Officers from ASNAPP and ASI. Following these meeting, GIDA has given authorization for water to be delivered for production and training activities on the scheme.
- ii. Collaborative effort with key partners greatly enhanced the outreach to farmers, participation in training programmes and improved outcomes of project.
- iii. Efforts made to change the bad production practices have paid off, a group from the Atomic farm fields called the 'New Generation' won an award in the recently ended farmer's day programme. This drew the attention of CSRI crop division and MOFA extension services to the group to provide them further education to enhance the work and change in farmer's attitude.

#### **4.0 LESSONS LEARNT**

- i. Successful demonstration of technical knowledge backed by use of adaptable local systems and materials are very effective in securing farmers' buy-in and commitment to invest in new improved production techniques and systems.
- ii. Soliciting farmer's inputs and inviting their suggestions on project design can greatly enhance the successful outcome of targeted interventions and also ensure that solutions are relevant and will enhance operations of project beneficiaries.
- iii. It's essential to build flexibility and adaptability into project implementation. Extreme temperatures at Torgorme project site rendered the greenhouse structures ineffective as high day temperatures recorded inside the tunnels scorched plants and was leading to crop failure. This was very discouraging and dis-incentivizing to farmers. Successful modification of the structures, through use of shadenet insertions to the mid sections, which resulted in huge temperature drop (from 47-52 to about 35 degree Celsius) did not only save the plants and reverse the crop failure but also demonstrated to the farmers, the importance of adapting technology to better suit local conditions.

#### **5.0 CHALLENGES**

- i. The late start of the project pushed commencement into the raining season in the Torgorme project area. Most farmers were unwilling to initiate production activities due to the high flooding risk and associated crop failure. Farmer field production thus delayed but with the cessation of rains and success of the ASNAPP open field demonstration plot, farmers have commenced land preparations for the dry season production.
- ii. One key challenge was having to deal with ASI Ghana through the ASI Washington office. ASI Ghana conformed to the internal reporting guidelines between itself and HQ rather than what was expected of it as outlined in the ICCO-Cash project. Financial reporting guidelines and project reporting timelines were not respected. The change of project managers by ASI also further delayed the project as it took time for the new project manager to appreciate issues on the ground.

## Appendix A: Planned Activities for Commercial Alliance for Smallholder Horticulture Project (CASH-P) – (April – Sept. 2015)

Key Activities	Detailed Activities	Output	Responsible Institution	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Joint Activities	Development of a business plan for TAGFU		ASNAPP, ASI									
	Development of a 5 years strategic plan for TAGFU											
Pivot Centre Irrigation System	Identify & Select farmers for training	60 Farmers Identified, Selected & Trained on GAP, GPHP	ASI									
	Technical & agronomic training											
	Management, financial & business training											
	Support Farmers to operate and manage a centre pivot	60 Farmers supported to operate and manage a 60ha centre pivot irrigation schemes										
Capacity Building by ASI & VEGPRO	Identify & Select farmers for training	250 farmers identified, selected & trained 150 farmers supported to produce Vegetable	ASI									
	Technical & agronomic training (GAP & GPHP)											
	Management, financial & business training											
	Support farmers towards production											
Capacity Building of Farmers by ASNAPP	Identify & Select farmers for training	250 farmers identified, selected & trained	ASNAPP									
	Technical & agronomic training (GAP & GPHP)											
	Management, financial & business training											
	Support farmers towards production											
Establishment of Demo Sites ( Shadenet, Plastic tunnel & Intensive open field)	Production ( Nursery, Transplanting, Agronomic Practices, Post Harvest)		ASNAPP									
Strengthening TAGFU Governance and Management System	<b>Capacity strengthening for TACFU &amp; Selected FBOs</b>		ASI									
	-Governance & management systems	Capacities 50 Executives of TAGFU & FBOs built in governance & financial mgt										
	-Financial & business training	TAGFU and FBOs equipped with										
	<b>Resourcing of TACFU</b>	Office Supplies delivered										
	-Procurement of Office Supplies	Data Software developed										
Market Facilitation	Establish market linkages between the producers and VEGPRO	Produce purchased by VEGPRO	ASNAPP & ASI									
	Establish market linkages between the producers and Agri-Impact	Produce purchased by AGRI-IMPACT										
	B2B Exchange											
Project Monitoring	Field Office		ASNAPP & ASI									
	Head Office											
	Project Management Meeting											

CASH-P, February 2016



## Appendix B: A summary of Planned Activities and Results for Quarter 1, 2015 under CASH Project

Key Activities	Expected Results	Results and accomplishment	Variance & Remarks	Means of Verification
Project Inception	-Awareness & Sensitization Programme -Baseline Data Collection	<ul style="list-style-type: none"> <li>• Consultative meetings for Apex body &amp; beneficiary communities organized</li> <li>• Baseline data for <b>95 farmers (10%)</b> collected</li> </ul>		Field Reports
Pivot Centre Irrigation System	-Capacity building for Centre Pivot 60 Farmers on -Development of training material -Technical & Agronomic training (GAP & GPHP) -Management, financial & business training	<ul style="list-style-type: none"> <li>• Capacities of <b>60 Pivot Centre farmers</b> built in financial &amp; business management</li> <li>• <b>60</b> copies of training materials developed and printed</li> </ul>	•	Back to office reports Field Reports
Resourcing & Capacity strengthening for TACFU & Selected FBOs	-Procurement of Office Supplies -Database development & management system -Development of training material -Governance & management systems training -Financial & business training	<ul style="list-style-type: none"> <li>• Office supplies purchased</li> <li>• <b>64</b> Training materials developed and printed</li> <li>• Training on Database done</li> <li>• Database system developed, user trained for data capturing</li> </ul>		Database done Training materials printed
Capacity Building of Farmers by ASI & VEGPRO	Capacity strengthening for 250 VEGPRO small holder out-growers -Development of training material -Technical & Agronomic training (GAP & GPHP) -Management, financial & business training	<ul style="list-style-type: none"> <li>• Capacities of <b>137 Smallholder farmers</b> built in financial &amp; business management and GAP</li> <li>• <b>250</b> copies of training materials on GAP developed and printed</li> </ul>	•	Back to office reports Field Reports List of farmers

Capacity Building of Farmers by ASNAPP	Capacity Strengthening for 250 Furrow small holder producers -Development of training material -Technical & Agronomic training (GAP & GPHP) -Management, financial & business training	<ul style="list-style-type: none"> <li>• <b>400</b> training manuals on GAP designed and printed</li> <li>• <b>400</b> training manuals on business development practices designed and printed</li> <li>• Capacities of <b>161 farmers</b> built on Good Agricultural Practices and Post-Harvest Practices in a 4-Modular training programme</li> <li>• <b>213</b> producers (Akuse &amp; Atomic) capacities built in Business Development skills</li> <li>• <b>15 FBOs members</b> participated in F2F exchange programme</li> <li>• Capacity training on Management, financial &amp; business training is ongoing</li> </ul>	•	Back to office reports Field Reports Participants list
Establishment of Demo Sites (Shadenet, Plastic tunnel & Intensive open field	Establishment & Maintenance of Tunnels, shadenet & open field demonstrations for 250 furrow producers	<ul style="list-style-type: none"> <li>• 310sq.m and 210sq.m greenhouse structures established at Akuse</li> <li>• 210sq.m greenhouse structures established at Atomic</li> <li>• 1½ acre open field intensive production in progress currently</li> <li>• 8m x 12m net-house nursery and 300sq.m greenhouse structures under construction at Atomic to raise high quality seedling for producers</li> <li>• 6m x 4m net-house nursery structure constructed at Akuse to raise seedling for production</li> <li>• 8m x 12m net-house nursery structure constructed at Atomic to raise seedling for production</li> <li>• Currently, 33,650 seedlings have</li> </ul>	•	Back to office reports Field Reports Participants list

		been raised at the Akuse nursery and about 2,000 raised at Atomic in the given structure		
Market Facilitation	Market Facilitation for small holder farmers (farmer exchanges, buyer interactions, trade facilitation supplies)	<ul style="list-style-type: none"> <li>•Leadership of TACFU have been introduced to Agri-Impact and VegPro trade discussions</li> <li>•Atomic farmers have been introduced to Agri-Impact and will soon be introduced to other exporters as well</li> <li>•Sales of <b>\$302,746.71</b> done so far</li> </ul>		
Business Development	<ul style="list-style-type: none"> <li>-Development of a business plan for TAGFU</li> <li>-Development of a 5 years strategic plan for TAGFU</li> </ul>	<ul style="list-style-type: none"> <li>•Business plan and 5 years strategic plan for TAGFU done</li> <li>•</li> </ul>	•	