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Entrepreneurship for Commercial Seed Incubation Business

CONSOLIDATED FINAL REPORT

August, 2015 – March, 2017

Grant Number: 2015 – SSTP - 019

Project Title: Entrepreneurship for Commercial Seed Incubation Business



AGRA
Growing Africa's Agriculture

FARA
Forum for Agricultural Research in Africa

agriimpact
CONSULT

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ACRONYMS

ECoSIB	-	Entrepreneurship for Commercial Seed Incubation Business
AIC	-	Agri – Impact Consult
FARA	-	Forum for Agricultural Research in Africa
AGRA	-	Alliance for Green Revolution in Africa
AAIN	-	African Agribusiness Incubator Network
KNUST	-	Kwame Nkrumah University of Science and Technology
GLDB	-	Grains and Legumes Development Board
CRI	-	Crop Research Institute
EGS	-	Early Generation Seed
B/A	-	Brong-Ahafo Region
A/R	-	Ashanti Region
V/R	-	Volta Region
E/R	-	Eastern Region
N/R	-	Northern Region
SMEs	-	Small and Medium Enterprises
SSTP	-	Scaling Seed Technology Partnership
SARI	-	Savannah Agricultural Research Institute
MOFA	-	Ministry of Food and Agriculture
NASTAG	-	National Seed Traders Association of Ghana
GSID	-	Ghana Seed Inspectorate Division of MOFA

ACKNOWLEDGEMENT

AGRA

Richard James – Chief of Party; Dr. Kwasi Ampofo – Country Director; Forster Boateng – Country Coordinator

FARA

Dr. Yemi Akinbamijo – Executive Director; Dr. Irene Annor-Frimpong – Director for Research & Innovations

KNUST

Prof. Richard Akromah – Povost, College of Agricultural & Natural Resources; Dr. Francis Appiah – College of Agricultural and Natural Resources; Dr. Ben Banful - College of Agricultural and Natural Resources; Dr. Eli Gaveh - College of Agricultural and Natural Resources

GLDB

Dr. Robert Asuboah – Executive Director

USAID

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CRI

Dr. Obeng-Antwi – Principal Research Scientist/Maize breeder

SARI

Dr. Francis Kusi - (PhD) Research Scientist (Entomologist) CSIR – SARI

MOFA

Mr. Eric Quaye – Deputy Director, Ghana Seed Inspection Unit

NASTAG

Mr. Kwame Adu-Gyamfi – National Chairman, NASTAG

Mr. Thomas Havor –National Secretary, NASTAG

Mr. Emmanuel Adjei – Business Development Consultant

1.0 INTRODUCTION

The goal for the establishment of ECoSIB in Ghana was to increase availability and accessibility of superior quality seeds to smallholder farmers through scaling up volume of breeder and foundation seeds and develop a cadre of seed business entrepreneurs with the requisite skills to engage in commercial production and distribution of superior quality seeds in Ghana.

One of the many challenges of the seed sector in Ghana is the gap between research and business. Research findings have not been properly aligned to commercial interest to attract the kind of private investment that is needed to revamp the seed sector. Research on new technologies on seed, new varieties with better yields and drought resistance are most of the time, replete on the shelves of many agricultural research institutions. ECoSIB was to create a platform and facilitate the provision of requisite incentives that both stimulate private sector actors and researchers to proactively engage in commercialization of technologies and improved varieties. This would accelerate the responsiveness of researchers to private sector needs.

ECoSIB was funded through the Scaling Seed and Technologies Partnership (SSTP) of AGRA through FARA and it adopted the integrated value chain approach to addressing key issues identified as slowing the growth of the seed industry in Ghana such as low level of entrepreneurial skills and poor distribution systems.

The Initiative was modelled after FARA/UniBRAIN's tripartite collaboration between Universities, Research and Business for agricultural innovation development and technology commercialization.Kwame Nkrumah University of Science and Technology (KNUST), Crop Research Institute (CRI), Grains and Legumes Board of the Crop Services Directorate and the Seed Inspection Unit under PPRSD Ministry of Food and Agriculture and Agri-Impact Consult (AIC) formed a consortium to establish the Seed Business Incubation-Ghana. Agri-Impact Consult led the implementation of the initiative

The project was implemented over a 19-month period beginning from 1st August 2015with the purpose of improving the technical and managerial competencies of seed business entrepreneurs. It sought to achieve five (5) outputs by the project end date of 31st March 2017:

- One central Seed Business Incubation Centre Established
- 10 Commercial Seed Business Entrepreneurs incubated
- 20 Certified Seed Growers Trained for business growth and profitability
- 3 Private Entrepreneurs Mentored for Production of Early Generation Seed (EGS)

PROJECT BENEFICIARIES

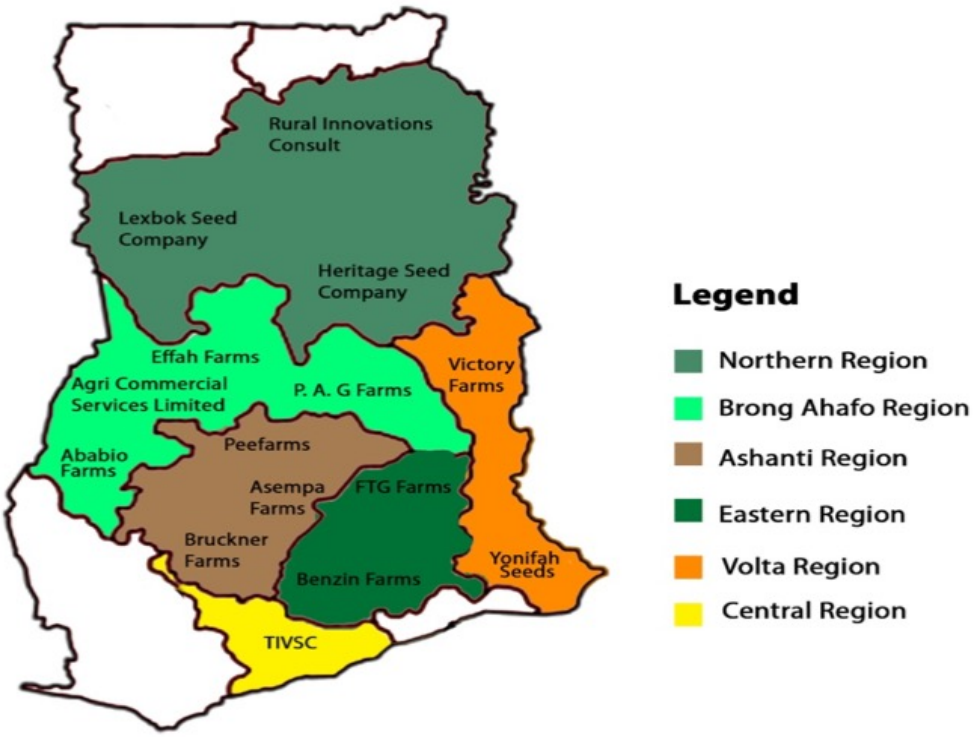
Fifteen (15) seed SMEs were drawn from across the country and twenty (20) enterprise farmers who have made the initiative to adopt the yam minisett technology were also selected from the East Gonja and Tolon districts in the Norther Region through consultative discussions with the Seed Associations including SEEDPAG & NASTAG, SARI, industry experts/Institutions such as GLDB, recommendations by AGRA and other relevant stakeholders for mentorship and coaching for this project. Selection criteria such as the scale of operation of the SMEs, potential impact the project will make, willingness and readiness to partner with the project among many other considerations

were used. Three (3) of the seed companies were mentored for the production of early generation seeds.

LIST OF PROJECT BENEFICIARIES

NO	*NAMES OF SEED MAIZE COMPANIES*	*CONTACT PERSONS*	*REGION*	*LOCATION*	*TEL. NOS.*
1	Ababio Farms	Mr. Johnson Ababio	BA	Wenchi	0208808078
2	Pag Farms	Mr. Apraku Gyau	BA	Wenchi	208221787
3	Agri Comm. Service	Mr. Adu Gyimafi	BA	Wenchi	0208727777
4	Bruckner Farms	Ms Martha Bruckner	AR	Ejura	0208180485
5	Pee Farms	Mr. Issifi Pangabu	AR	Ejura	0208167865
6	ITVSC	Mrs. Afua Ansre	CR	Bawgiase	0207009067
7	Glaco Farms	Mrs. Gladys Quaye	VR	Ho	0243735673
8	Benzin Farms	Agbedanu Godwin	VR	Kpando	0205608195
9	Effah Farms	Mr. Francis Guamah	ER	Techiman	0243350758
10	Yonifah Seed	Mr. Thomas Havor	VR	Dedukkope	0208714626
11	Asempah Frams	Mr. Francis Asempah	AR	Toase	0506557845
12	Lexbok seed Co.	Mr. Alex Bokum	NR	Tamale	0245380808
13	Rule Innovations C.	Mr. J. S. Bapule	NR	Tamale	0506481811
14	Heritage Seed	Mr. Iddrisu S. Zakaria	NR	Tamale	0543370501
15	Victory Farms	Mr. Joseph Amartey	ER	Sikabeng	0244937430
NO	**NAMESOF YAM ENTERPRISE FARMERS**	**TYPE OF SEED**	**REGION**	**LOCATION**	**TELEPHONE**
1	Sulemana Alhassan	Yam	NR	Tingoli	0240768310
2	Yakubu Pe	Yam	NR	Salaga	0207529338
3	Baye Noah	Yam	NR	Salaga	0249224599
4	Baye Nelson	Yam	NR	Salaga	0547154669
5	Ngenapoa Biligna	Yam	NR	Salaga	0209094789
6	Christopher Gmajerime	Yam	NR	Salaga	0207436924
7	Jagnajorgma Kijanank	Yam	NR	Salaga	0541528368
8	Waja Ndigna	Yam	NR	Salaga	0205307261
9	Mohammed Adam	Yam	NR	Tingoli	0543847781
10	Natogma Zakariah	Yam	NR	Tingoli	0248771422
11	Samuel Makikube	Yam	NR	Salaga	0247750773
12	Freeman Atta	Yam	NR	Salaga	0209299873
13	Abibu Iddirisu	Yam	NR	Salaga	0207260866
14	Mohammed Tusani	Yam	NR	Tingoli	0240120670
15	Afa ISSAKA	Yam	NR	Tingoli	0546368401
16	Mohammed Karim	Yam	NR	Tingoli	0240209659
17	Abdulai Abdukai	Yam	NR	Tingoli	0549600986
18	Afa Gunundolli	Yam	NR	Tingoli	0205652679
19	Alhassan Haporo	Yam	NR	Tingoli	0241168679
20	Zakaria Baba	Yam	NR	Tingoli	0547649368

OPERATIONAL AREAS OF THE PROJECT



This report embodies all activities undertaken under the project during its first phase of implementation ending 31st March 2017, detailing achievements and challenges of the project implementation, and the proposal for the no cost extension. The period under reporting witnessed the following activities;

- Office set-up and Recruitment of Staff
- Grantor – Grantee Inception Meeting
- Reconnaissance Survey for Seed Business Implementation, Institutionalization and Seed Processing
- 1st and 2nd Partners Implementation Planning Workshop
- Selection and Profiling of Seed Companies
- Collection of Baseline and Analysis of Data from Incubatees
- Launch of ECoSIB
- Development of ECoSIB Website and Social Media Pages
- Development and Printing of ECoSIB Brochure and Promotional Materials
- Capacity Building and Technical Trainings
- Development and Printing of Competency Based Training Manuals
- Partners implementation review meeting
- Profile of Partners and Mentors
- Hybrid line seed generation/multiplication

- On-site handholding for Seed Companies
- Support to Seed Yam Entrepreneurs
- Seed Market Survey and Development
- Farm Assessment
- Seed Business Quality Systems and Traceability Audit
- Capacity building in incubation management for Incubator Managers
- AAIN Conference and trade exhibition
- Support to NASTAG – Development of Website
- Strategic Networking
- Proposal for No Cost Extension

2.0 PROJECT OVERVIEW

Project Title	Entrepreneurship for Commercial Seed Incubation Business (ECoSIB)
Grant	AGRA-SSTP
Prime Contractor	Forum for Agricultural Research in Africa (FARA)
Sub-Contractor	Agri-Impact
Implementing Institutions	Agri-Impact (Lead), KNUST, Crop Research Institute, MOFA, Grains and Legumes Development Board, African Agribusiness Incubator Network (AAIN)
Contract Period	August 1 2015-March 31st 2017
Total Grant Amount	$591,450.00
Sub grant to Agri-Impact	$469,950.00
Goal	To increase availability and accessibility of superior quality seeds to smallholder farmers in Ghana.
Objectives	• To build the technical and managerial competencies of SMEs in seed business and develop a cadre of business entrepreneurs with the requisite skills to engage in commercial production and distribution of improved seeds. • To increase availability of improved quality seeds of selected crops to smallholder farmers • Facilitate market linkage between certified seed producers and seed buyers.
No Cost Extension	April1 to November 30th 2017

3.0 ACTIVITY IMPLEMENTATION

3.1 Office Set-up and Recruitment of Staff

The ECoSIB Office, located at the premises of Agri-Impact, was set-up and office equipment such as printer, photocopier, laptops and office furniture and stationery were procured. Advertisements were placed on the Agri-Impact Website and Social Media Portals for the Position of Business Manager of ECoSIB and Seed Business Specialist. Prospective applicants were screened, selected and interviewed by a panel from AIC. The successful applicants were oriented and offered Letters of Appointment detailing job description and key performance indicators. The ECoSIB staff temporarily shared office space with the staff of Agri-Impact pending the final polish up of their office, which was completed in the first quarter of 2016.

3.2 Grantor - Grantee Inception Meeting

To kick-start the implementation of ECoSIB, a Grantor - Grantee Inception Meeting was organized on the 16th of October 2015 at the Conference Room of Ghana Institute of Engineers, Accra among Agri-Impact, FARA and AGRA. The objective of the meeting was to:

- Provide AGRA, FARA and AIC members understanding of ECoSIB: objectives, outputs, roles and responsibilities of partners, business model and performance indicators
- Understand AGRA's project implementation requirements including financial and technical report format, compliance issues, SSTP programme objectives and long term strategies, and exploring synergies among AGRA programmes
- Discuss key activities for the 1st and 2nd quarter of the project

Three different presentations were made during the meeting, namely; Scaling Seeds and Technology Partnership by Foster Boateng from AGRA - SSTP; Seed Sector Development in Africa by Alex Ariho from FARA/AAIN; and Overview of ECOSIB by Dan Acquaye from AIC.

3.2.1 Presentations at Grantor - Grantee Inception Meeting

3.2.1.1 Brief Overview of Scaling Seeds and Technology Partnerships by Foster Boateng (AGRA-SSTP)

The presentation noted that the Scaling Seeds and Technologies Partnership is working in six countries (Ethiopia, Ghana, Malawi, Mozambique, Senegal & Tanzania) within the New Alliance for Food Security and Nutrition framework where it will help governments strengthen their seed sectors and promote the commercialization, distribution and adoption of quality seeds of superior varieties and other key technologies. Its strategic objective is to increase income and reduce poverty by promoting the development of a seed system that delivers new crop technology to farmers in an efficient, equitable, and sustainable manner. The program has three specific objectives: (i) improving the capacity of public and private sector groups to deliver quality seeds and other technologies to smallholder farmers; (ii) improving the capacity of smallholder farmers to adopt quality seeds and technologies; and, (iii) improving the policy and regulatory mechanisms for the delivery of quality seeds and technologies to smallholder farmers.

3.2.1.2 Brief Overview of UNiBRAIN/AAIN by Alex Ariho (FARA/AAIN)

The point was made that **UniBRAIN** is an initiative of the Africa Commission funded by the Government of Denmark led by FARA, assisted by six partner institutions: ANAFE, PanAAC, ABI-ICRISAT, ASARECA, CCARDESA and CORAF/WECARD. The mandate of UNIBRAIN is to commercialize agribusiness innovations and technologies, provide graduates from tertiary education institutions

with knowledge and skills to become successful agribusiness entrepreneurs; and share and scale up innovation experiences, practices and lessons. The main objective of UniBRAIN is to create jobs and increase incomes through sustainable agribusiness development.
The UniBRAIN programme will formally terminate in March 2015. The African Agribusiness Incubator Network (AAIN) has been established to continue the activities of UniBRAIN beyond the Danida funded phase. It will serve as the competitive hub of innovations in agribusiness incubation in Africa, facilitating establishment and growth of sustainable agribusiness incubators; enhancing knowledge, information, best practices and lessons learnt in agribusiness. It coordinates innovative business models for agribusiness financing and investments, promotes and enhances access to market for network of agribusiness incubators.

3.2.1.3 Brief Overview of ECoSIB by Dan Acquaye (AIC)

It was explained that Entrepreneurship for Commercial Seed Incubation Business (ECoSIB) is an initiative between Agri-Impact Consult (AIC), a private institution and FARA to build the technical and managerial competencies of SMEs in seed business, and further develop a cadre of seed business entrepreneurs with the requisite skills to engage in commercial production and distribution of superior quality seeds in Ghana.
Specifically, ECoSIB is to collaborate with relevant institutions to raise new cadre of private seed inspectors, private foundation seed producers and competitive commercial certified seed producers.
ECoSIB will focus on Rice, Maize, Cowpea, Soybean, Cassava and Yam.

Entrepreneurship for Commercial Seed Incubation Business (ECoSIB) is adopting the FARA-UniBRAIN approach that emphasizes tripartite collaboration between Universities, Research and Business for agricultural innovation development. Kwame Nkrumah University of Science and Technology (KNUST), Crop Research Institute (CRI), Grains and Legumes Board, the Seed Inspection Unit of Ministry of Food and Agriculture and Agri-Impact Consult (AIC) have formed a consortium to establish the Seed Business Incubation-Ghana. ECoSIB is funded by AGRA under its STTP programme and is the first Seed Incubator in Africa.

3.2.2 Summary of Key Issues and Action Points from the Meeting

ACTIVITY	**RESPONSIBLE INSTITUITION**
Develop Scope of work with partners	Agri-Impact
Identify location for incubation Centre	Agri-Impact
Prepare Budget from August to December	Agri-Impact/FARA
Prepare Monitoring and Evaluation Matrix/Indicators	FARA
Conduct a Meeting with Crop Directorate of MOFA to brief and update the Directorate about ECoSIB	Agri-Impact
Develop Financial, Administration Manual and Procurement Manure	Agri-Impact
Provide contact details of Seed Enterprise Management Institute of University of Nairobi for competency based curriculum development	AGRA
AGRA to share following documents:	AGRA

ACTIVITY	RESPONSIBLE INSTITUITION
• National Seed Policy • Grant Narrative Interim Report • PTT Template • 2015-2016 Work plan for SSTP Ghana • Financial Report Format • New Alliance for Food Security and Nutrition in Ghana	
Prepare Press Release on ECoSIB	FARA/Agri-Impact
Organize Partners Meeting in Kumasi to discuss scope of work	Agri-Impact
Develop ECoSIB promotional materials including Website, Flyers and Brochures	Agri-Impact
Prepare Work plan till Dec 2015	Agri-Impact

3.2.3 Gallery of Participants at Grantor – Grantee Inception Meeting

3.3 Reconnaissance Survey for Seed Business Implementation

Agri-Impact undertook a reconnaissance survey with the view to:

- Update itself with the current seed industry situation and how ECoSIB model will respond to the challenges faced by the sector
- Engage selected industry players to seek their perspectives on crops that should be selected for phase 1 of ECoSIB activities
- Introduce ECoSIB to industry players

Findings:
Based on interactions with the stakeholders and key industry experts, yam and maize were selected as the main crop for phase I intervention and the following business models were proposed:

3.3.1 Increasing access and availability of quality seed yam to smallholder farmers in Northern Ghana to exploit increasing demand.

Yam is a strategic commodity for Ghana, the most preferred and the second most widely cultivated tuber after cassava. It is among the 5 priority crops identified by the Ministry of Food and Agriculture (MOFA) for value chain development and it contributes significantly to food security, and economic development. Ghana is the second largest producer of yam in the world after Nigeria, producing about 7.07million tons annually over 421,558ha of land. It contributes 16% to agricultural Gross Domestic Product (GDP). The BrongAhafo and Northern regions are the largest producers of yam in the country accounting for 64% of total national output. High cost and often unavailability of planting materials, scarcity and high cost of labour, declining soil fertility, lack of staking materials especially in the Guinea savannah zone and incidence of pests and diseases have been identified as major constraints to yam production on large scale in Ghana.In spite of the increasing global demand for yams coming from Europe, the U.S. and neighboring African countries, the farmers can do very little to increase production to meet these high demands.
The main traditional methods used by the smallholder farmers for seed yam generation is “milking” which involves harvesting the yam tubers early in the season to promote regeneration of smaller tubers (yam setts) later in the season to be used as seed yam. This is also supplemented with the use the yam heads, smaller tubers and other parts of the yam that can sprout as seeds yam. The farmers are often not able to generate enough seed yam from these traditional methods thereby preventing them from expanding the area under yam cultivation despite the availability of fertile land and demand for yam domestically and abroad.
ECoSIB therefore will respond to the demand of the yam minisett by increasing access and availability of quality seed yam to smallholder farmers in Northern Ghana through facilitation of the adoption of the minisett technology among enterprise yam producers.
Objective
The main purpose of the project is to increase access and availability of quality seed yam
Specific Objectives:

- To strengthen the capacities of selected yam seed entrepreneurs through training to adopt Miniset technology in yam setts production.
- To disseminate to the farmers proven good agricultural practices through farmer field business school.
- To improve shelf life of seed yam through adoption of improved yam storage structures and training in good storage practices.
- To strengthen the entrepreneurial skills of the enterprise farmers to adopt the seed yam production as a business **using the Seed Business Toolkit manual**

Methodology

The seed business entrepreneurship programme will be carried out in two districts in northern region, East Gonja and Tolon districts. In each district at least 10 seed entrepreneurs who have made initiative to adopt the minisett technology will be selected. Starting from this dry season, six (6) improved yam storage structures will be constructed for them to extend the shelf life of their seed yam as well as training in good storage practices using the farmer field business school approach. The seed business entrepreneurs will also be trained in entrepreneurship and seed business management. Each of the selected enterprise farmers will establish their minisett fields during the main season (May to October).
The project will facilitate their adoption of proven good agricultural practices through training to strengthen farmers' capacities to adopt the technology, linking them to sources of inputs and service and occasionally assisting them with some inputs and other services to ease the adoption process. Their business management and economic analysis skills will also be strengthened to enable then approach the seed yam production as a business. The farmers will also be exposed to the huge market available to absorb their produce as a way of motivating them to do more to take advantage of this. Good harvesting and postharvest practices will be introduced to the farmers through training and demonstration and the cycle will continue with the improved storage structures and good storage practices.

3.3.2 Increasing access and availability of quality seed maize to smallholder and commercial farmers in Ghana to exploit increasing demand.

Maize is also a strategic commodity in Ghana and the second most consumed crop after cassava.
Asuoyeboah-Kumasi Seed Processing and Storage Centre will serve as the focal point for training of seed entrepreneurs in the areas of post harvesting seed processing and storage.

- GLDB will use its Asuoyeboah-Kumasi Seed Processing and Storage Centre as the focal point for training of maize seed entrepreneurs.
- Scale out availability of foundation seeds to maize seed entrepreneurs
- Provide technical training including quality control, seed processing, post-harvest handling and preservation
- Train maize seed entrepreneurs on seed policy, innovative technologies and expose Entrepreneurs to opportunities

Methodology
In this area GLDB, KNUST, Crop Research Institute and Ministry of Food and Agriculture will collaborate with National Seed Traders Association (NASTAG) identify up to 20 active and long-term seed producers and organize 3 short courses that will enable them professionalize their seed business operations. The following specific activities will be conducted:

- Conduct training in general seed production principles and practices for 20 seed from across the country to bring them up to date with general seed production practices to ensure that they would be using the latest seed production technologies and principles on their farms.
- Conduct a specific hybrid seed production-training course for 20 seed entrepreneurs to introduce/re-train them in hybrid seed maize production.
    - Module 1 would introduce participants to principles and practices of hybrid seed maize production after which they would go to the field to plant a 1.0 ha hybrid seed field to simulate what they should do on their own farms
    - Module 2 would be another 3-day hybrid seed training programme coinciding with the time of detaselling of the field planted in module 1. Other post planting activities would be highlighted on.
    - Module 3 would be the last 3-day training programme to coincide with harvesting of the field planted and detasseled in modules 1 and 2. Other precautionary practices in pre-harvest hybrid seed production would be highlighted on.

- Conduct a 3-day specific training programme in post-harvest handling, processing and storage of seed at the Asuoyeboah seed processing and storage centre for 20 seed producers at a period that would coincide with the peak processing and storage for seed producers at the centre.

3.3.3 Familiarization Visit to the Kumasi Seed Processing Centre

Agri-Impact undertook a familiarization visit to the Kumasi Seed Processing Centre as part of the reconnaissance survey of the Seed industry in Ghana. The visit revealed that the seed processing centre in Kumasi needed serious rehabilitation, revamping and good management to increase patronage and make it more sustainable.

3.3.3.1 Gallery of the Kumasi Seed Processing Centre during Visit

3.3.4 Institutionalization of ECoSIB and Seed Business

It was discovered through the reconnaissance survey that The Kwame Nkrumah University of Science and Technology (KNUST) is in a process of launching a new programme in Seed Business. This programme is an initiative of Bill and Melinda Gates Foundation to develop high-level seed experts within West Africa. The programme is designed for the Masters level: MBA Seed Business, MSc. Seed Technology and MA. Seed System.

The University considers ECoSIB as integral part of the Masters programme to be rolled out. The faculty of Agriculture agreed to incorporate some of the curriculum developed by ECoSIB into the Masters programme and vice versa. This was a sustainable way of institutionalizing the ECoSIB model and Seed Business in Ghana

Also, the institutionalization strategy considered the Grain and Legumes Development Board. According the Ghana Seed Strategy currently developed, the Ministry of Agriculture will support the private sector to deepen investment in the seed sector including production of early generation seeds. In addition, each District in Ghana is expected to establish a small to medium scale seed processing centre. The objectives and business model of ECoSIB respond directly to government seed strategy and will serve as a precursor for implementation of the strategy through the GLDB.

3.4 First (1st) Partners Implementation Planning Meeting

A Partners Implementation Planning Workshop was organized for the ECoSIB Consortium Members. The main objective of the meeting was to present the synopsis of ECoSIB to consortium members and help members fine-tune the roles of implementing partners. This was in pursuance of the workplan adopted at the ECOSIB Inception meeting. Specifically, the meeting:

- Elaborated on the business model to adopt for ECoSIB implementation vis-à-vis the findings of the reconnaissance survey
- Contributions of each institution to ECoSIB
- Strategic fit of ECoSIB to the institutions' mandate
- Institutionalization of ECoSIB activities
- Assessing the Seed Processing Centre for training

All the implementing partners participated in the meeting, comprising, **KNUST** (Prof Richard Akromah, Provost, College of Agriculture and Natural Resources; Dr. Francis Appiah, Vice Dean, Faculty of Agriculture; Dr. Eli Gavey, Seed Specialist, Department of Horticulture); **Grains and Legumes Development Board (**Dr. Robert Asuboah, Deputy Director); **Agri-Impact/ECoSIB (**Dan Acquaye, Executive Director, Agri-Impact; Evelyn Denchern, Finance and Administrative Officer; Kingsley Jectey, Business Manager, ECoSIB)

3.4.1 Summary of Key Issues from Meeting

Institution	**Activities**
Overview of ECoSIB	Entrepreneurship for Commercial Seed Incubation Business (ECOSIB) is an initiative of AGRA, FARA and Agri-Impact Consult, established out of the need to upscale production, supply and by extension use of superior quality seeds by smallholder farmers in Ghana. ECOSIB operates through Institutional partnership and works with seed value chain actors using the incubator approach. It adopts the FARA-UNIBRAIN model that emphasizes tripartite collaboration between Universities, Research and Business for agricultural innovation development. ECOSIB will focus on increasing availability and accessibility of seeds of superior varieties for Maize, Rice, Soybeans, Cowpea, Yam and Cassava.

Roles of KNUST	• Design and offer competency- based training in seed production and delivery system for seed entrepreneurs. Model training course after Seed Enterprise Management Institute (SEMIs) in Kenya. • Adopt the African Seed Toolkit as key training materials for the proposed competency-based training course for the operators in the seed production and delivery services • Incorporate seed agribusiness opportunities into its programmes and introduce graduate internship in seed business.
Roles of GLDB	• Scale out availability of early generational seeds to seed entrepreneurs • Provide technical training including seed production technologies, seed processing, post-harvest handling and preservation. • Train seed entrepreneurs on seed policy, innovative technologies and expose entrepreneurs to opportunities
Agri-Impact	• Provide leadership role among consortium members to coordinate all activities • Provide business training for incubatees • Develop marketing plan and establish market linkages and facilitation • Lead the establishment of ECoSIB as a sustainable institution • Provide strategic guidance • Strengthen networks and partnerships
FARA	• Establishing &Strengthening Networks and Partnership • Development of Promotional Materials, Documentation and sharing of best practices • Provide Technical Support and Quality Assurance • Capacity Building & Coordination • R&D Support by CORAF • Seed Incubation Hand Holding Support ICRISAT • Provide M&E Support
Guiding Principles	Consortium members identified accountability, transparency, coordination and quality as key success factors and urged all to uphold them as implementation guidelines to ensure the successful execution of the Seed Incubation Project.

3.4.2 Gallery of 1st Partners Implementation Planning Workshop

3.5 Second (2nd) Partners Programme Implementation Planning

A partner's meeting was held on 28th January 2016. The objective was to update partners on progress, fine-tune the implementation model and scope of work, plan for first ECoSIB Workshop and set implementation timelines. The work plan for quarter 2&3 of 2016 and reporting format were thoroughly discussed. Partners were guided and briefed on the technical and financial reporting systems and guidelines.

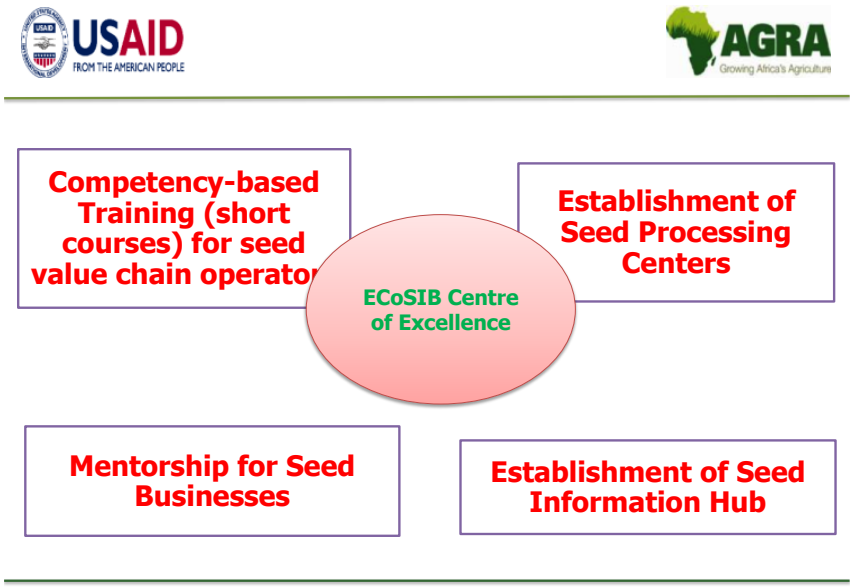
A total of 7 members from the partnering institutions participated in the meeting, comprising, **KNUST (**Prof Richard Akromah, Provost, College of Agriculture and Natural Resources; Dr. Francis Appiah, Vice Dean, Faculty of Agriculture, Department of Horticulture and Dr. Banfo, Faculty of Agriculture); **Grains and Legumes Development Board (**Dr. Robert Asuboah, Deputy Director); and **Agri-Impact/ECoSIB (**Dan Acquaye, Executive Director, Agri-Impact; Evelyn Denchern, Finance and Administrative Officer; Kingsley Jectey, Business Manager, ECoSIB).

The meeting led to the forging of Networks and Partnerships with some key actors in the Seed Industry, namely;

1. Crop Research Institute (CRI)
2. National Seed Traders Association of Ghana (NASTAG)
3. Inspection Division of Ministry of Food and Agriculture

3.5.1 ECoSIB Business Model

As part of his presentation, Mr. Dan Acquaye explained the ECoSIB business model to the participants, which will be used for the implementation of the project.



3.5.2 Summary of Action Points from the 2nd Partners Meeting

NO	ACTIVITY	IMPLEMENTATION TIMELINE	RESPONSIBLE INSTITUITION
1	Selection of Incubatees/SMEs	February 2016	AIC/GLDB
2	Profiling of SMEs	February 2016	AIC/GLDB
3	Identify Business Location of SMEs and their focal crops	February 2016	AIC/GLDB
4	Develop Baseline Data Sheet	10th February 2016	AIC/GLDB
5	Conduct Baseline Study	8th March 2016	AIC/GLDB
6	Analyze Baseline Study and Provide Baseline Report	15th March 2016	AIC/GLDB
7	Develop Training Materials on Principles and Practices of Seed Production and Seed Business Management	February 2016	GLDB/KNUST/AIC
8	Conduct Training in Business Principles and Practices and Seed Business Management	8-11th March 2016	GLDB/KNUST/AIC

9	Develop website and other Social Media tools to Profile and Promote SMEs.	April 2016	AIC

3.6 Selection of Seed Companies (Incubatees)

Fifteen (15) seed SMEs were drawn from across the country through consultative discussions with the Seed Associations including SEEDPAG & NASTAG, industry experts/Institutions such as GLDB, recommendations by AGRA and other relevant stakeholders for mentorship and coaching for this project. Selection criteria such as the scale of operation of the SMEs, potential impact the project will make, willingness and readiness to partner with the project among many other considerations were used. Of the fifteen (15) SMEs incubated, three (3) of them are being mentored for the production of early generation seeds. Different levels of seed business SMEs, dealing in commodities such as maize, cowpea, rice and yam were selected from across the country. 20 Seed Yam Enterprise Farmers were selected in consultation with SARI and industry experts in Northern Ghana to be handheld to produce Yam Seeds using the minisett Technology

3.7 Collection of Baseline and Analysis of Data from Incubatees

Baseline studies on the seed SMEs selected as incubatees for handholding and mentorship were conducted to generate information that will enable ECoSIB track its performance and measure impact being made with the key beneficiaries. Key information needed for the study included: key operational areas such as economic and financial performance of the SMEs, size of farm, yields, and crops under cultivation, farm location, and volume of sale, value of sales, profit/loss and systems put in place. Below is the data from the selected SMEs for 2015 against which performance will be measured.

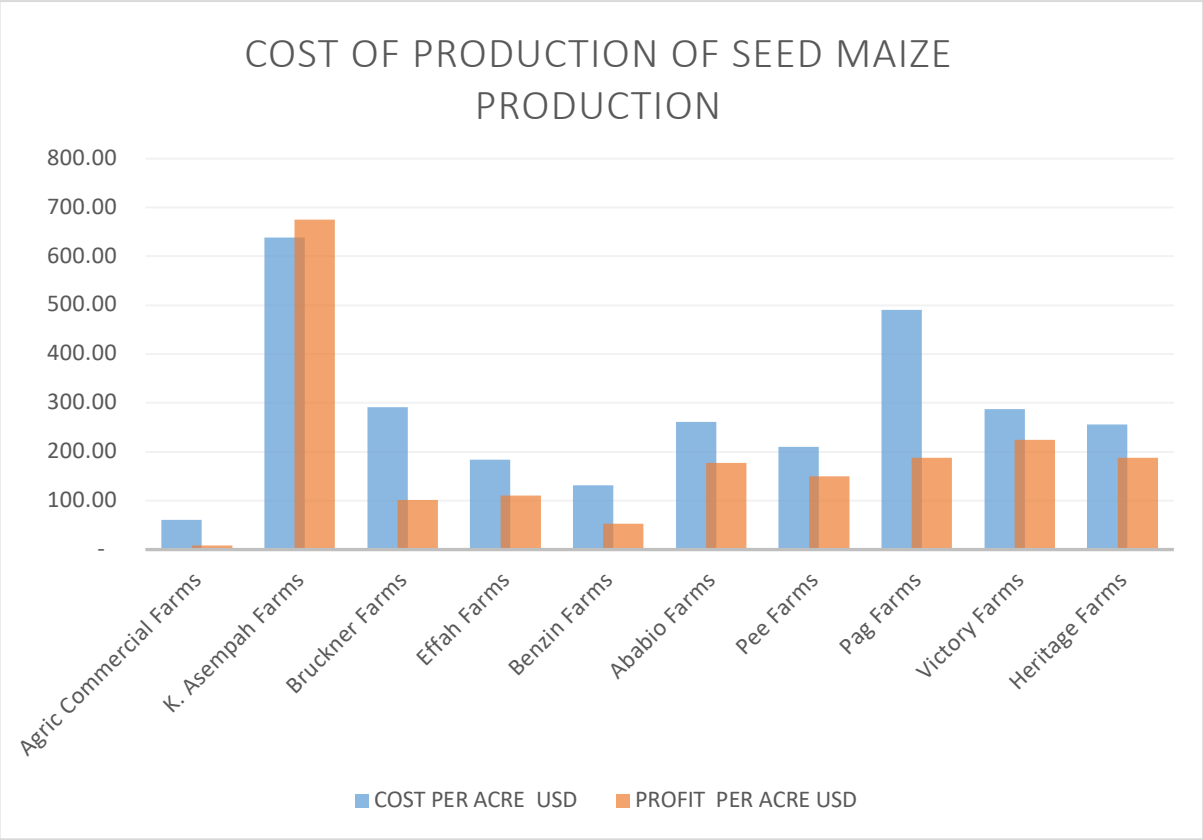
3.7.1 Baseline Data – Seed Companies

NAME OF SEED COMPANY	TYPE OF SEED	CLASS OF SEED	TOTAL LAND AREA (IN ACRES)	PRODUCTION (IN M/T)	YIELD PER ACRE	TOTAL COST OF PRODUCTION	TOTAL REVENUE (GHc)	PROFIT (GHc)	COST PER ACRE (GHc)	REVENUE PER ACRE (GHc)	PROFIT PER ACRE (GHc)
Agri Comm. Farms	Maize & Cowpea	Foundation/ certified	550	60	0.11	33,633.64	38,350.79	4,717.15	61.15	69.73	8.58
K. Asempah Farms	Maize & Cowpea	Certified	9.25	5	0.54	5,900.52	12,142.41	6,241.89	637.89	1,312.69	674.80
Bruckner Farms	Maize	Certified	200	150	0.75	58,324.61	78,534.03	20,209.42	291.62	392.67	101.05
Effah Farms	Maize	Certified	100	32	0.32	18,455.50	29,450.26	10,994.76	184.56	294.50	109.95
Benzin Farms	Maize & Cowpea	Certified	30	10	0.33	3,926.70	5,497.38	1,570.68	130.89	183.25	52.36
Ababio Farms	Maize & Cowpea	Certified	50	27	0.54	13,089.01	21,989.53	8,900.52	261.78	439.79	178.01
Pee Farms	Maize	Certified	1000	516	0.52	210,122.25	360,209.42	150,087.17	210.12	360.21	150.09
Pag Farms	maize & Cowpea	Certified	120	170	1.42	58,921.47	81,439.79	22,518.32	491.01	678.66	187.65
Victory Farms	Maize	Certified	75	44.1	0.59	21,596.86	38,481.68	16,884.82	287.96	513.09	225.13
Heritage Farms	Maize & Cowpea	Foundation/ certified	310	120	0.39	79,528.80	137,958.11	58,429.31	256.54	445.03	188.48

3.7.2 Cost Structure of Seed Maize Production

No	Input / Activity	Southern
A	**Land rent**	80.00
	Registration as Seed Producer	20.00
	Registration for class of seed	20.00
	Sub total	**120.00**
B	**LABOUR INPUT**	
	Land clearing (amortized over 5 years)	60.00
	Manual field clearing	96.00
	Land preparation – 1st ploughing	200.00
	2nd ploughing	200.00
	" " - harrowing	--
	Planting	130.00
	Weed control - spraying	50.00
	" " - manual	50.00
	Fertilizer application –1 & 2)	80.00
	Rogueing	60.00
	Thinning	
	Harvesting and gathering of cobs	290.00
	Sorting	125.00
	Shelling and winnowing	250.00
	Drying and cleaning	152.00
	Transportation of inputs	45.00
	Transportation of produce	162.00
	Picking/treating/bagging	300.00
	Satcheting and bagging	80.00
	Packing	25.00
	Sub total	**2,355.00**
C	**VARIABLE INPUTS**	
	Breeder seed	113.00
	Fertilizer – NPK	600.00
	" " - SOA	200.00
	Herbicides (litres)	160.00
	Packaging materials (45 kg polysacks, 1 kg bags)	320.00
	Field Inspection	60.00
	Sub total	**1,453.00**

D	**TOOLS & EQUIPMENT**	
	Hoes/Cutlasses/Baskets & field boots (2 seasons)	200.00
	Sub total	**200.00**
E	**SAMPLING/TESTING**	40.00
	Sub total	**40.00**
F	**CERTIFICATION (Tags)**	68.00
	Sub total	**68.00**
G	**STORAGE (6 MONTHS)**	540.00
	Sub total	**540.00**
		4,776.00
H	**MANAGEMENT &SUPERVISION 5%**	237.00
	Sub total	237.00
		5,013.00
I	**INTEREST ON BANK LOANS**(6 months) at 35% Interest	877.28
	Sub total	**877.28**
	GRAND TOTAL	**5,890.28**



3.7.3 Cost of Production of Seed Production

Standard average yield per acre of land = 0.8 m/tons

From figure 1 above, it is realized that 20% of seed maize companies operate above the standard average of yield per acre which is 0.8m/tons, whiles 10% of them are clustered just around it. The remaining 70% of seed maize companies operate below this point.

Standard average crop budget for acre of land = Gh2,356.11 = USD616.78

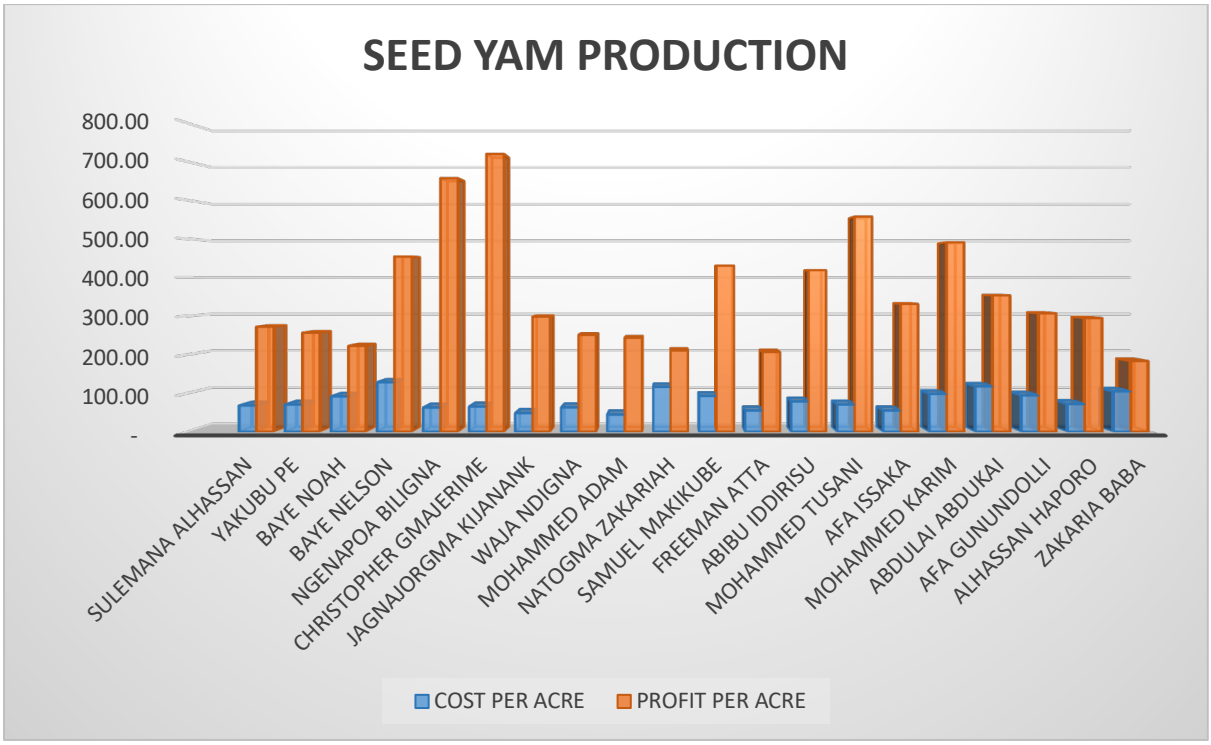
It is again notable from figure 1 that only 10% of the seed maize companies spent close to the average standard crop budget of USD616.78 per acre of land during the 2015 farming season. The remaining 90% of the seed companies spent far less than the standard average during the period under review.

3.7.4 Baseline – Seed Yam Producers

NAME OF SEED COMPANY	TYPE OF SEED	CLASS OF SEED	TOTAL LAND AREA (IN ACRES)	YIELD IN M/T	YIELD PER ACRE	TOTAL COST OF PRODUCTION	TOTAL REVENUE	PROFIT	COST PER ACRE	REVENUE PER ACRE	PROFIT PER ACRE
Sulemana Alhassan	Yam	Certified	2	11	5.5	136.12	680.63	544.51	68.06	340.32	272.26
Yakubu Pe	Yam	Certified	2	8	4	141.36	654.45	513.09	70.68	327.23	256.55
Baye Noah	Yam	Certified	1	4	4	183.24	628.27	445.03	183.24	628.27	445.03
Baye Nelson	Yam	Certified	3	15	5	256.54	1,164.92	908.38	85.51	388.31	302.79
Ngenapoa Biligna	Yam	Certified	2	7	3.5	125.65	1,439.79	1,314.14	62.825	719.90	657.07
Christopher Gmajerime	Yam	Certified	2	9	4.5	130.89	1,570.68	1,439.79	65.445	785.34	719.90
Jagnajorgma Kijanank	Yam	Certified	2	6	3	96.85	693.72	596.87	48.425	346.86	298.44
Waja Ndigna	Yam	Certified	2	4	2	126.3	628.27	501.97	63.15	314.14	250.99
Mohammed Adam	Yam	Certified	2	7	3.5	89	575.92	486.92	44.5	287.96	243.46
Natogma Zakariah	Yam	Certified	2	8	4	232.98	654.45	421.47	116.49	327.23	210.74
Samuel Makikube	Yam	Certified	2	5	2.5	185.86	1,047.12	861.26	92.93	523.56	430.63
Freeman Atta	Yam	Certified	2	4	2	109.94	523.56	413.62	54.97	261.78	206.81
Abibu Iddirisu	Yam	Certified	2	9	4.5	157.06	994.76	837.7	78.53	497.38	418.85
Mohammed Tusani	Yam	Certified	2	6	3	141.36	1,256.54	1,115.18	70.68	628.27	557.59
Afa ISSAKA	Yam	Certified	2	8	4	109.94	772.25	662.31	54.97	386.13	331.16
Mohammed Karim	Yam	Certified	2	6	3	196.33	1,178.01	981.68	98.165	589.01	490.84
Abdulai Abdukai	Yam	Certified	3	8	2.67	235.6	942.41	706.81	78.53	314.14	235.60
Afa Gunundolli	Yam	Certified	2	5	2.5	188.48	802.36	613.88	94.24	401.18	306.94
Alhassan Haporo	Yam	Certified	2	7	3.5	143.97	732.98	589.01	71.985	366.49	294.51
Zakaria Baba	Yam	Certified	2	7	3.5	209.42	575.92	366.5	104.71	287.96	183.25

3.7.5 Average Seed Yam Budget for an acre of land

Setts	165
Cost of leasing land	50
Land clearing	30
Land preparation	120
Planting	36
Staking	12
Weeding:	
1st	21
2nd	21
Harvesting	70
TOTAL COST	**525**



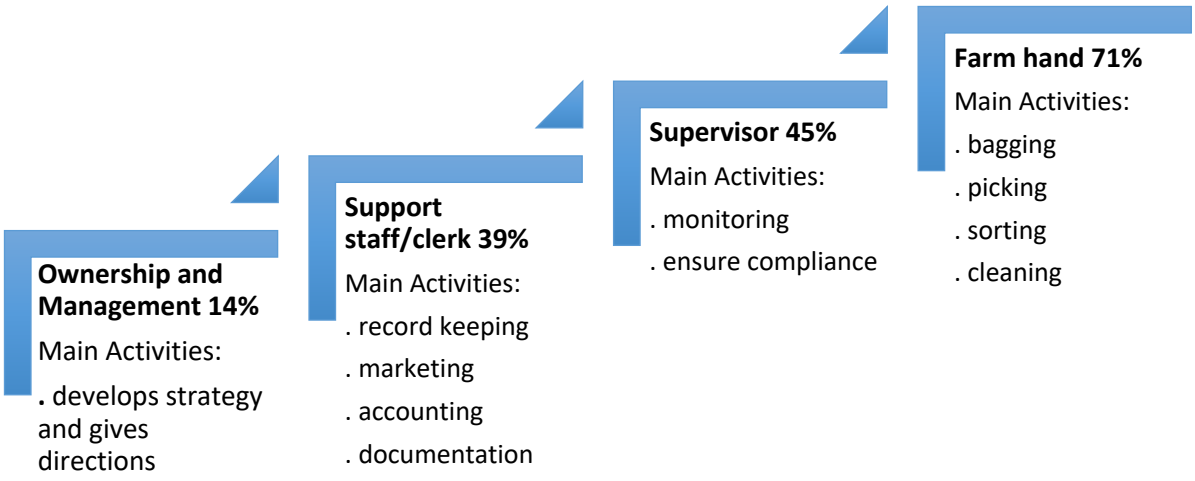
3.7.6 Standard average yield for acre of land = 0.125 m/tons

As indicated in figure 2 above, only 5% of the seed yam enterprise farmers achieved production yield above the standard average of 0.125 tons per acre of land. The remaining 95% achieved below the average yield per acre of land. About 15% of the seed yam enterprise farmers achieved production yield of less than half the standard average in 2015.

Again, as indicative in figure 2, all the seed yam enterprise farmers invested less than 25% of the standard average budget per acre of land.

3.7.7 Gender Analysis – Seed Companies

	Composition of workers	Male (%)	Female (%)
Ownership	14	86	14
Management	14	86	14
Supervisor	11	55	45
Support staff/clerk	90	61	39
Farm hand	585	19	71
Total	**714**		



The 15 seed companies surveyed provide 714 direct jobs of which 72% are women. However, ownership and management of seed companies are male dominated as they constitute about 86% of the human resource at both the top and middle levels. Women constitute about 81% of the labor force at the casual level. The composition of women increases as you move down the agricultural labour force.

Women are the backbone of the rural economy, yet female share of the agricultural labour force is predominantly casual. Women receive only a fraction of the land, credit, inputs such as improved seeds and fertilizers, agricultural training and information as compared to their male counterparts as a result of the traditional and socio-cultural settings which tend to relegate women to the casual agricultural labour market.

3.8 Launch of ECoSIB

ECoSIB was launched in Accra under the theme **"Increasing the availability and accessibility of seeds of superior quality to smallholder farmers in Ghana"** on the 30th June, 2016. The launch which was aimed at officially unveiling ECoSIB to relevant stakeholders, such as the government, development partners, the private sector and the general public, was also intended to galvanise the active private sector participation in the seed value chain in Ghana. The launch sought to sensitize the relevant stakeholders on the objectives, design, outputs and outcomes of ECoSIB, and also present the opportunities for scaling out to them, while facilitating the linkage between research, government, development partners and the private sector to sustain and up-scale the project objective and impact.

Present at the launch were representatives of the Minister of Food and Agriculture, development partners, implementing organizations, financial institutions, farmers, farmer organizations, the media, stakeholders and experts across the seed value chain. In all, about sixty (60) people participated in the launch. The launch was participatory, informative and reassuring with all partners pledging their support and commitment to making ECoSIB successful to achieve the necessary impact.

There were presentations, remarks and comments from;

- Dr. Yemi Akinbamijo, Executive Director of FARA
- Dr Kwasi Ampofo, Country Head of AGRA
- Dr. Alex Ariho, Unibrain Coordinator
- Mr. Daniel Acquaye, Executive Director of Agri-Impact Consult
- Mr Samson Konlan, the representative of USAID
- Prof. Richard Akromah, the Provost of the College of Agriculture and Natural Resources, KNUST
- Mr. Thomas Havor, National Coordinator of NASTAG
- Mr. Seth Osei Akoto, the Acting Director of the Ministry of Food and Agriculture
- Dr. Tara Wood, from the IFDC-ATT project
- Mr. Seth Paul Havor, a farmer from Yonifah Farms and an incubatee of ECoSIB

3.8.1 Keynote Address Extract

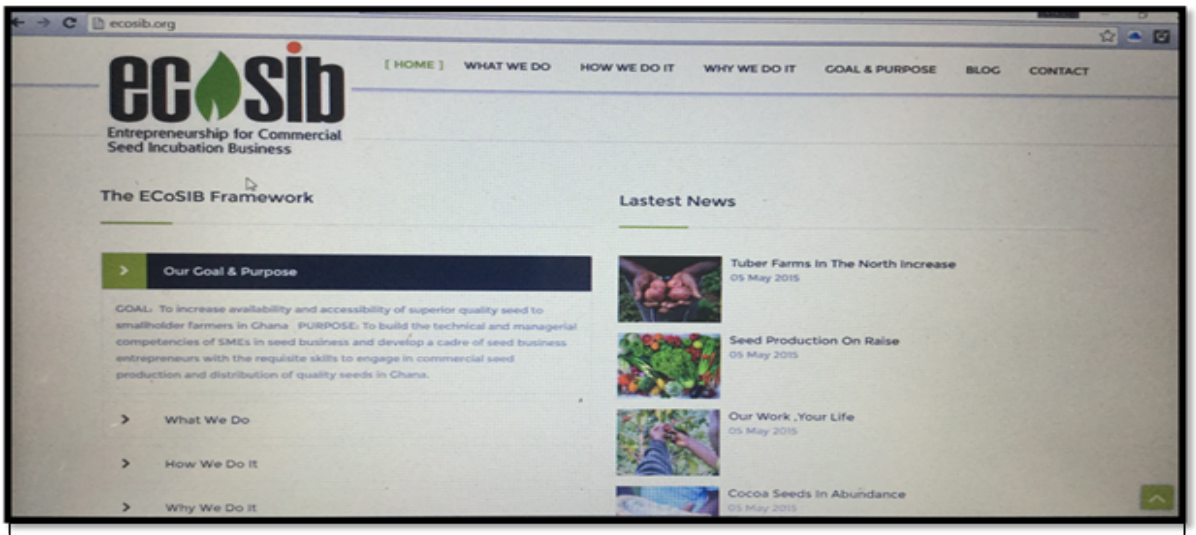
The keynote address, delivered on behalf of the Minister of Food and Agriculture by Mr. Seth Osei Akoto, the Acting Director of MOFA, underscored the importance of the agriculture sector to the economic growth of Ghana, indicating that the sector contributes an average of 28% to the National GDP and providing employment for about 41.6 % of the economically active population.Turning his attention to the Seed Sector, Mr Osei Akoto stressed that the primary, simplest, and easiest of the technologies, yet most crucial to drive the food production value chain made available to farmers, is seed and that it is only after the most appropriate seed of high quality is used that all the other technologies can realize their full potential. Based on this, he remarked that supplying farmers with high quality seed of improved, high yielding, adapted varieties is the starting point to improving agriculture, especially in Africa where the use of landrace varieties has resulted in stagnated agricultural development against an ever increasing population.Consequently, the Acting Director of MOFA, praised the effort by USAID, AGRA and the other development partners who have partnered the ministry to promote sustainable agriculture and thriving agribusiness through research and technology development, effective extension and other support services to farmers, processors and traders for improved livelihood.

Furthermore, Mr Osei Akoto lauded ECoSIB for its timely intervention to complement Government's effort in strengthening the capacity of the existing fragmented and under-resourced private sector to respond adequately to the Government's new policy of privatization of the commercial components of the seed industry in Ghana stressing on the importance of facilitating a shift in leadership in the commercial aspects of the seed industry to the private sector, and the need for a strong government role in the provision of the requisite infrastructure and regulatory framework for the effective development of the seed industry. The keynote address threfore called for partnership and close cooperation between the private sector (seed growers, distributors and input dealers), research and public institutions to synergize strengths and capabilities of all key stakeholders for a sustained outcome.

3.8.2 Gallery of ECoSIB Staff present at the Launch

3.9 Development of ECoSIB Website and Social Media Pages

In fulfilment of project indicators, the **ECoSIB website** (www.ecosib.org) was developed and a demonstration on it was made by SIRI Communications during the launch. The ECoSIB website provides an easy and convenient interface where people can access all information about ECoSIB, namely, its aim, objectives, activities, work plan and schedules, list of incubatees and partners, information about mentors, upcoming events, news and relevant information within the seed industry and in the agro-value chain. The website is highly interactive, giving the opportunity for people to post their requests, enquiries, questions, suggestions or remarks and get appropriate response to them.



Homepage of Ecosib Website

3.9.1 ECoSIB SOCIAL MEDIA PAGES

ECoSIB has also created WhatsAPP platform (Social Media) where Mentors (both technical and Business) and Incubatees share ideas and information. Updates and relevant news items are posted periodically to inform incubatees and stakeholders on happenings in the seed industry and the agro value chain

3.10 Development and Printing of ECoSIB Brochure and Promotional Materials

3.10.1 ECoSIB Brochure

As part of the launch activities, the **ECoSIB Brochure**, detailing the aim, objectives, activities, partners, seed incubatees and projections of the initiative, was also launched. The electronic version of the Brochure can be found on the ECoSIB Website

Cover Page of ECoSIB Brochure

3.10.2 Other Promotional Materials

As part of efforts to create awareness of the ECoSIB project among relevant industry stakeholders and the general public, promotional materials were developed and printed. These included flyers, pull-ups and banners

3.10.2.1 ECoSIB Flyers

3.11 Capacity Building and Technical Trainings

3.11.1 Business Management Training For Seed Business Entrepreneurs

Seed Business Management training was organized for 15 SMEs selected from 5 regions of Ghana. The rationale for the training was to build the technical and managerial competence of seed

entrepreneurs to professionalize their operations to become more productive, profitable and competitive.

Opening the 2-day training workshop, Professor Richard Akromah, the Provost of the of the College of Agriculture and Renewable Natural Resources, KNUST, said seed is life and the importance of seed should not be underestimated. He appreciated the initiative and support of AGRA/USAID for this intervention at the time when the dwindling agricultural sector needs revamping. He reiterated that the seed business incubation project links up perfectly with KNUST's MBA and MSC programme in Seed Business, Seed Technology and Seed Systems in terms of focus and direction and called for more collaborative efforts between the two institutions to scale up availability and accessibility of improved seeds to the smallholder farmers. Professor Richard Akromah revealed that, Alliance for Green Revolution in Africa (AGRA), through the Programme for Africa Seed Systems (PASS), invested significantly in the provision of MSC Fellowship in seed professionals. This necessitated a proposal to develop an Integrated Curriculum for a Postgraduate Programme on Seed Science, Seed Business and Seed Systems which the University currently runs. The main objective of the programme, according to Professor Akromah, is to train well qualified seed professionals in Africa. He urged the participants to put into practice the knowledge they would acquire for business growth and development. Out of the 15 selected and incubated, 3 were actually assisted to undertake the production of Foundation seeds this season.

Participants were taken through topics such as:

a. Principles of Seed Production
b. Seed Business Management
c. Seed Marketing Management
d. Using Social Media to Promote Seed Business

3.11.1.1 Highlights of Workshop Presentations

3.11.1.1.1 Presentation on the Overview of ECoSIB

Mr. Dan Acquaye of Agri-Impact Consult, the lead implementer of the Seed Business Incubation Project, on the synopsis of ECoSIB made this presentation. He informed participants of the rationale for the seed business incubation project, building the technical and managerial competencies of seed SMEs to increase availability and accessibility of improved seeds to address limited adoption and utilization of superior seeds by smallholder farmers in Ghana. He indicated that over 75% of

Ghanaian farmers do not have access to certified seeds especially maize and therefore resort to planting their own saved seeds or seeds from other sources which mostly are of poor quality resulting in low grain yield. Average improved crop variety adoption rate is less than 6%, he said, for which he indicated that the threat to food security in Africa is imminent. He identified weak seed production and distribution systems and intra-regional disparities in policy and regulatory framework as major impediments to improved seed adoption.
In response to these challenges, a critical area of investment with the potential for quick impact on food security and income has been identified, and this is getting the ready available improved technology off the shelf of research institutions to smallholder farmers. In this direction, many efforts have been made by Governments and the Alliance for Green Revolution in Africa (AGRA) to build the capacities of African Scientists to breed high yielding crop varieties and improve on African seed policies to enhance seed distribution.

Mr. Dan Acquaye also highlighted on the fact that ECoSIB is funded by the Scaling Seed and Technologies Partnership (SSTP) programme of AGRA and is modeled after FARA/UniBRAIN's tripartite collaboration between Universities, Research and Business for agricultural innovation development. Agri–Impact Consult, Kwame Nkrumah University of Science and Technology (KNUST), Crop Research Institute (CRI) and the Ghana Grains and Legumes Development Board (GLDB) formed ECoSIB consortium to develop seed incubation businesses in Ghana. The consortium works with key stakeholders and value chain actors within the seed sector such as the Product Associations and Councils, Agro-Input Dealers, Seed Production Associations, Seed Distributors, Certified Seed Growers, Off-takers, Aggregators and Operators of Agribusiness Centres.

3.11.1.1.2 Presentation on Principles of Seed Production

Dr. Asuboah of Grains and Legumes Development Board (GLDB) was the expert who took participants through the Principles of Seed Production. In his presentation, it was established that plant breeders continue to make marginal advances in developing high yielding, adaptable, disease-free crops. These advances, however, cannot be realized until an efficient seed production system is in place that rapidly increases genetically superior crops and makes them available to the consumer in large quantities at a reasonable cost.

Participants were taken through seed production techniques and best agronomic practices and were urged by the facilitator to practice these principles if the goal of yield maximization is to be achieved. Key topics highlighted were:

- Classes of Maize Seed
- Breeder seed production of OPVs
- Developing new Hybrid
- Choice of parental lines
- Controlled Pollination Techniques
- De-tasseling and removal of off-type
- Spacing for OPVs
- Fertilizer application
- Weed/Insect control

In his concluding remarks, Dr. Asuboah recapped that successful seed production requires seed to be genetically pure, free from admixtures and able to establish rapidly a uniform stand and that Seed production is a complex process such that quality systems and protocols must be followed by both seed producers and seed companies to ensure that high quality seed is produced and distributed.

3.11.1.1.3 Presentation on Seed Business Management

Dr. Francis Appiah of KNUST, presented this session. The Seed Business Management encompasses all aspect of the seed business from planning through production to finance with emphasis on human capital. He said that the goal of a seed business is supported by the three main strategies of Production, Marketing and Finance. These strategies are developed within the context of the seed business environment and serve to guide the real-time activities of a company.

According to him, the Seed Manager needs to balance all three strategies within the framework of the resource limitation and personnel capacity, whilst accommodating and making the most of the prevailing external socio-economic environment. He stated that Seed Business Management strategies are not static, but need to be flexible and adjustable, neither are they of any value unless implemented with purpose so that the gains from private breeding efforts are made available for increased and sustainable agricultural production.

The participants were exposed to sound business practices which will enable them build healthy and sustainable seed enterprises, among which are:

- Components of a seed business
- Business strategy
- Personnel management
- Record keeping
- Profit concept
- Quality control and quality assurance

With this exposure, the participants were equipped with a strong working knowledge of the critical success factors for a seed enterprise and how to achieve them.

3.11.1.1.4 Presentation on Seed Marketing Strategies

Dr. Banful of KNUST facilitated this session. He indicated that increased production of agricultural crops depends not only on the development of higher yielding varieties of seeds but also on the efficiency of the systems available to ensure these seeds reach the farmer on time and at an affordable price. Effective seed marketing is thus essential component of activities to improve food security.

He tasked the participants to be commercially strategic in their business approach through the application of sound management and marketing techniques by:

1. Conducting and implementing seed market studies in order to improve seed sales
2. Facilitating the development of local distribution network
3. Bridging the information, time, spatial and value gaps that exist between seed businesses and farmers.
4. Strengthening seed promotions programmes and implementing efficient methods to improve farmer's knowledge and skills relating to seed varieties.

Participants were also guided to recognize that the customer determines the product and the product determines the customer; and the more knowledge a seed company has about the target customer, the better the needs of the customer are served.

Participants were taken through several topics including:

- Identifying and understanding the target market
- Determination of seed price
- Supply and demand relationship

- Understanding the customer's buying criteria
- Matching the customer and the products
- Understanding and competing with the competition
- Branding

The marketing strategy of a seed company as emphasized by Dr Banful, is concerned primarily with meeting the seed needs of customers and competing with the competition. Participants were urged to engage in active selling, particularly with intermediaries such as wholesalers and retailers to ensure that farmers have access to seeds.

3.11.1.1.5 Using Social Media to Promote Seed Business

Social marketing as a strategy to changing the social behavior of target consumers is the way to go given the social interactive pattern of the technological age. It combines the best elements of the traditional approaches to social change in an integral planning and action framework and utilizes advances in communication technology and marketing skills. As part of the training package, ECoSIB engaged an inbound marketing and media coordination firm, called ***Go Viral*** to take participants through the use of social media to promote their seed business. This company was also tasked to publicize the ECoSIB workshop through various social media. This partnership added on to the 5 existing partnerships formed already, making it 6 partnership. We plan to form further partnerships and collaborations that will help us to deliver and reach more farmers.

Participants were exposed to the various social media tools that they can use to create awareness about their business, and attract customers to and establish influential social media presence for business visibility and sustainability. Platforms or tools such as Facebook, twitter, Instagram, YouTube, google+, tumbler etc can be used to attract customers.

The facilitator took participants through an excitingly interactive exercise of developing content ideas for the social media platform, some of which includes:

- Random tips and facts on agriculture in general and selected crops
- Know-how tips on seed
- Spotlight on stakeholders
- Motivational and inspirational quotes some of which includes food, crop production, farming, agribusiness
- Action shots

The interest of the participants was so elevated that they demanded for accounts to be opened for them. They saw it as a good opportunity to let people know what they do so that they can leverage the numbers to increase sales.

3.11.1.1.6 Updates on Early Generation Seed Study – Forster Boateng

The country coordinator of SSTP, Mr. Forster Boateng briefed participants on the on-going Early Generation Seed (EGS) study in the country, which seeks to identify all the issues in the seed sector from stakeholder perspective and to address bottlenecks for a better agricultural performance.
He highlighted on the following:

- Background and purpose of the EGS study
- Current situation of the Early Generation Seed in Ghana
- Scope of EGS study in Ghana
- Current challenges of EGS in Ghana

It is the hope of the facilitator that the outcome of the study will guide policy formulation to address key challenges in the seed sector to pave the way for increased supply and adoption of EGS and by extension increased agricultural productivity.

3.11.1.2 Key Issues/Observations from the Training Workshop

Key observations from the training workshop:

1. Incoherent business records among majority of seed businesses
2. Techniques taught/knowledge acquired at training workshops are hardly put to use
3. Non-existence of production, marketing and financial systems in most seed entreprises
4. Weak access to information on variety release and market source
5. Seed entrepreneurs are unfamiliar with National Seed Plan and the various requirements/modalities therein

Business records of most of the Seed Enterprises were either arbitrarily kept or non-existence making it difficult to develop a trend against which project impact will be assessed. Seed Business SMEs and incubatees were engaged in interactive interview to obtain relevant information on their business, needed as reference point against which performance will be measured.

To minimize the impact of these challenges on the business operations of the Seed SMEs in a more sustaining manner for positive intervention outcome, ECoSIB will draw on the rich experiences of its mentors to guide the Seed business Incubatees organize basic records of business transactions and properly keep them for reference. Again, through its mentorship arrangement, ECoSIB will ensure that knowledge acquired by the seed SMEs will be put to good use. In this direction, a checklist will be developed to guide the Seed SMEs go through their daily business routines for effective technology/knowledge transfer.

Through its handholding strategy, ECoSIB will guide the seed SMEs set production, marketing and financial systems in place and create interactive platform for the seed value chain actors to share business information for business growth and sustainability.

As part of efforts to build the competency of the seed SMEs, the National seed policy, which creates conducive environment and provides guidance to all seed industry participants to enable them conduct their roles in a coordinated manner, will be summarized into a pocket size document and in a language that they can understand and follow the directions therein.






PHOTO GALLERY OF ECoSIB SEED MANAGEMENT WORKSHOP

3.11.2 Technical Training for Seed Maize Farm Technicians

Maize is a principal staple and commercial crop accounting for over 50% of cereal production in Ghana. About 63% of maize consumption in Ghana is either at the household level or informally traded. The remaining 37% is formally traded for use in the animal feed industry and industrial processing sector. About 24 varieties of maize including one foreign hybrid (Sika Aburo) have been released in Ghana. To date, Obatanpa remains the most widely known and grown improved maize seed though the variety is old and not adapted to drought. Newer OPVs like Omankwa, Abontem, Honampa, Opeaburo are slowly gaining currency because of their shorter growth duration, tolerance to drought and good yields.

In spiteof the availability of these new varieties coupled with the promotional efforts of government and its development partners, the awareness and adoption of these new varieties seems to be low as a result of the weak seed delivery systems in place. Additionally, most farmers lack the technical competency to use and manage these improved hybrid maize varieties in order to achieve expected yields and as a result be profitable, hence, the recorded maize yield in Ghana in 2015 was 1.92Mt/ha, far below the national achievable yields of 3.5 - 5.7 Mt/ha.

This phenomenon, necessitated ECoSIBs' tailored training for seed SMEs in Ghana on hybrid maize production

Consequently**, a 2-day technical training workshop** was organised in Kumasi for farm managers of seed companies who are incubatees under ECoSIB, to build their technical capacities on hybrid seed production.

The specific objectives of the technical training workshop were to;

i. Impart knowledge of hybrid seed production and distribution to seed business incubatees to professionalize their operations to become more productive, competitive and profitable.
ii. Develop the entrepreneurial skills of seed business incubatees and guide them to adopting business practices in seed maize production
iii. Expose seed business incubatees to practical hands-on experiment on best agronomic practices in seed production, especially, hybrid seed production

15 farm managers from selected seed companies, as well as representatives of the Grains and Legumes Development Board, the Crop Research Institute, KNUST and Agri-Impact Consult were in attendance at the technical training workshop.

3.11.2.1 Day 1: Training Workshop

A cross section of the participants at the training

The first day started with tutorial and discussion sessions led by the Crop Research Institute, the Grains and Legumes Board and Agri-Impact Consult. There were 3 sessions in the first day, with the first session consisting of 3 parts/topics all presented by Dr. K. Obeng Antwi, a breeder from the Crop Research Institute, While Dr. Robert Asuboah of the Grains and Legumes Board and Mr. Kingsley Jectey took the second and third sessions respectively

There were varied in-depth technical presentations made at the workshop and the topics taught included;

- **Hybrid-Seed Production in Maize**
- **Seed Certification**
- **Strategic Thinking for Seed Manager**

3.11.2.2 Day 2: Field Work

Dr.ObengAntwi guiding participants through field layout for planting

The second day was occasioned with practical field work at the demonstration field of Grains and Legumes Board to acquaint incubatees with hands-on experience on hybrid seed production. The objective of the field visit was to offer the participants a hands-on practical work and urge them to replicate same on their own farms.

Also more importantly it was to give the facilitators the opportunity to assess incubatees understanding of the principles of hybrid seed production as taught the previous day.

On the field, a recap of salient points was mentioned, key among them being isolation, land preparation, field layout for planting and actual planting. Participants took turns to ask questions on these issues and to engage in the land preparation, layout for planting and the actual planting. Collectively, participants with the guidance of the facilitators planted the hybrid seed maize on a 2-acre land, observing strictly the dos and don'ts of planting. The technical training workshop was interactive, educative and practical.

3.11.2.3 Comments by Some Participants

	**Johnson Ababio,** MD, Ababio Farms, Wenchi – BrongAhafo Region Farmland: 600acres	"The workshop has been very helpful. I foresee a lot of progress henceforth in my production, now that we have been taught hybrid production and I am certain that it will increase my yield and also my revenue"

	**Donkor Kennedy,** Manager, Effah Farms, Techiman – BrongAhafo Region Farmland: 100acres	"ECoSIB, through this workshop, has exposed me to a lot of things that I didn't know. One of the key things that I have learnt from this training workshop is records keeping. I am now well guided to run my farm as a business."
	**Seth Paul Havor,** Manager, Yonifah Seed Ltd, Kpando – Volta Region. Farmland: 500acres	"I have realised my shortcomings on the field and I am going to improve on them by following the best farm practices I have learnt from this workshop to maximize my seed population and revenue"

3.11.3 Business Management and Technical Training on SeedYam Production Using the Minisett Technology

Yam is a strategic commodity for Ghana. It is the most preferred and the second most widely cultivated tuber after cassava. Ghana is the largest exporter of yam in the world and it is also the 2nd largest producer in the world producing 7.07million MT after Nigeria which produces about 40million MT per annum. With the growing diaspora population in the West, demand for yam is expected to grow in the foreseeable future. Domestically, it is not only a main source of income, but it is a staple crop vital to food security.

However, high cost and often unavailability of planting materials, scarcity and high cost of labour, declining soil fertility, lack of staking materials especially in the Guinea savannah zone and incidence of pests and diseases have been identified as major constraints to yam production on large scale in Ghana. Yam farmers rate high cost and often unavailability of planting materials as highest among the above listed constraints, and this, it is noted, has been the main reason why local yam production has not been able to meet market demands.

Further to this, about 3 improved varieties have been released in the last 10 years, yet, there are no seed companies engaged in the production of commercial yam tubers. A few farmers have been trained under various projects to produce tubers for sale to growers using the minisett and, to a limited extent, vine technology. However, there is no information on quantities of improved tubers produced through such community production units, possibly as a result of the lack of business acumen and posturing of these farmers.

ECoSIB, realizing these challenges and the significance of yam as a food security crop as well as a cash crop, organized a **2-day business management and technical training** on seed yam production using the minisett technology to build the competencies of Seed Yam Enterprise farmers in Northern Ghana.
The objectives of the training workshop were:

1. To guide enterprise farmers to take seed yam production as a sustainable business venture and make the shift from subsistence farming to farming for profit
2. To stimulate changes in farmer's attitude by creating a class of business-minded farmers empowered to plan, produce, market and keep proper records for reference
3. Establish sustainable availability of high quality seed yam on a commercially viable and price competitive bases

20 seed yam enterprise farmers drawn from East Gonja and Tolon Districts in Northern Ghana were in attendance, together with representatives of SARI, MAP and Agri-Impact Consult.

3.11.3.1 Day 1: Training Workshop

A cross-section of See Yam Enterprise Farmers at the Workshop

The first day was characterized by tutorials and discussion sessions facilitated by Dr. Francis Kusi of SARI and Mr. Kingsley Jectey, the Business Manager of ECoSIB. Topics discussed at the tutorial and discussions session were as follows:

- **Applying Business Principles to Seed Yam Production**
- **Demonstration of Seed Yam Production using Minisett Technology**
- **Identifying Sources of Marketing**
- **Safer Use of Pesticides**

3.11.3.2 Day 2: Field Work

Dr. Francis Kusi with farmers on field demonstration of seed yam production using the minisett technology.

On the second day, all participants, led by Dr. Francis Kusi, were taken to the SARI Experimental field at Manga, a 20 minutes' drive from the training centre, to have a practical and hands experience on the minisett technology.

There was a quick recap of day 1's tutorials and discussions and participants were taken through practical on-field demonstrations ranging from land preparation, tuber selection and cutting, mounding and mulching.

3.11.3.3 Comments by Some Participants

	**SulemanAlhassan,** Seed Yam Enterprise Farmer from Gonja – Northern Region Farmland: 2 acres	"ECoSIB has changed my orientation about farming, I have been trained to act as a business man and I am going to do just that. This will help me plan and coordinate my farm activities so that I achieve higher yield and become profitability"
	**Freeman Atta,** Seed Yam Enterprise Farmer from Salaga - Northern Region Farmland: 3 acres	"I have been taught how to cut 25 pieces of seeds from a tuber of yam, and also how to multiply my yam seeds using the minisett, and now, I can make a lot of money to feed my family and pay my children's school fees"

3.11.4 On-Field Technical Training for Seed Companies

Pursuant to the technical training on hybrid seed production and its attendant field work at the experimental field of the GLDB in Afraku, in the Ejisu-Juaben District of the Ashanti Region, where incubatees were taken through actual planting of hybrid seeds, prudent planting techniques, field layout and good agronomic practices in quarter 3, The ECoSIB implementing team, in collaboration with its technical partners from the Grains and Legumes Board (GLDB), Crop Research Institute (CRI), and KNUST, organized a detasseling field-work training for its incubatees. This de-tasseling field-work and training was organized on the 14th July 2016, the required 55 days after the initial planting of the seed, to train incubatees (Seed Companies) on detasseling, removal of off-types and rogueing.

The technical mentors present at this training were Dr. Robert Asuboah, of the GLDB, Dr. Kwadwo Obeng-Asare of the CRI, and Dr. Francis Appiah of KNUST.

De-tasseling refers to the removal of the tassels from the female lines in order to generate pure and quality hybrid seeds. Dr. Robert Asuboah of the GLDB and Dr. Kwadwo Obeng-Antwi of the CRI took turns to explain the necessity and importance of de-tasseling to hybrid seed production and explained how it should be done.

According to Dr. Asuboah, de-tasseling and removal of off-types are two of the most critical operations for ensuring good seed quality.

The ECoSIB team observed that, the conditions on the experimental field, as met on the day for the detasseling were highly appropriate for instruction and training the incubatees. It was observed that;

- Plants were stressed
- Plants were not uniformed
- Maize streak disease was very common, with many plants showing symptoms
- The topography of the field was sloppy
- The field was well isolated
- The farm was well kept in terms of weed control

The technical mentors in commenting on the above conditions mentioned that erratic rainfall, late planting, erosion and the leaching of the nutrients from the soil were the reasons for the above conditions. They explained that these factors created a conducive environment for the streak disease, which is an environmental and a seed-borne disease, to show up.
Notwithstanding these conditions however, the technical mentors opined that the yield from the field is expected to be above average because of the good agronomic practices.

The field demonstration of hybrid seed production offered the seed technicians practical/hands-on experience of the principles taught at training workshop to replicate same on their respective fields to ensure appropriate technology transfer and enhance technology commercialization.

Dr Asuboah of GLDB making a point

Dr. Obeng-Antwi stressing a point

Some incubatees paying rapt-attention

Cross-section of incubatees at the field training

3.11.5 Training In Good Agricultural Practices (Gap) In Seed Yam Production

A total of 21 enterprise yam farmers from Tolon and East Gonja districts engaged under the mini sett technology were taken through technical training. Training included selected Good Agricultural Practices (GAP) such as weed control, staking, earthen up, disease identification etc.

Weed control

Weeds stands as one of the contributors to poor yield when not controlled properly and timely. Most especially the first weeding when the yam sprouts are yet to develop much rooting system to effectively compete with weeds. The use of recommended weedicide at right dose and time of usage contributes to the effective weed control on yam fields. During the training, farmers were encouraged to practice the habit of keeping yam field devoid of weeds. This should be done with the use of hoes or manual hand picking depending on the size of the field. Before establishment of fields, farmers were encouraged to make use of pre-andpost-emergence herbicides at the right recommendations to reduce the number of times weeding is done. Moreover, weeding using hoes should be done without the destruction of the mounds or ridges to avoid the exposure of the developing tubers to direct sunlight and yam beetle infestation. Stubborn weeds such as Spear grass (*Heteropogon contortus*) and "*Rottboellia cochinchinensis*" were taken into much consideration since they can cause havoc on the yam field.

Staking

Farmers are of the view that, staking of yam vines are only done on varieties such as Pona and Labako because they are the chief varieties and early maturing, but during the training, farmers were made aware of the importance of proper and early staking of vines. Staking of individual plants with stakes have been the traditional method but from the training, farmers were thought the use of nylon ropes and twines. This is much easier and also reduces the cutting of stakes which are hard to come by in some of the communities and where they are available cutting them also go against nature forestry regulations. Farmer on their own were able to trail their demonstration plots and vowed to practice on their fields during the next planting season.

Disease identification and rouging

One predominant problem with yam production is the incidence of diseases such as Yam Mosaic Virus, Anthracnose, leaf spot, insect attack and die back. Most of the times, farmers take the attack as a natural occurrence and do not take precautionary measures to control them. This leads to reduction in yield and a times tuber rot when not controlled early enough. Disease identification and rouging of diseased plants were stressed upon for farmers to take them seriously. The observation of changes in plant leaves such as unusual spots on the leaves, leaf colour changes, rolling of leaves, retarded growth, holes on leaves by insect and early senescence of leaves were the physical observations that farmers were made aware of. To control disease on yam fields, farmers were encouraged to use disease free tubers for planting and treat setts with fungicides, insecticides, bactericides before planting. Moreover, adopting the habit of keeping fields as clean as possible and also use of clean farm tools for field activities could help avoid spreading of diseases on the field. Farmers were also taught to rouge out plants that were affected by virus disease from the field by uprooting and burn them to avoid infection of other healthy plants.

Earthen up (reshaping of mounds and ridges)

Due to heavy rainfall and improper weeding on ridges and mounds, there is the tendency of ridges reducing in shape and size. This can cause the exposure of developing tubers to direct sunlight and lead to tuber rot. The exposed tubers are also easily infested by yam tuber beetles which results in numerous feeding holes on the tubers. Yam beetle infestation does not only reduce the market value of the tubers but also predispose the infested tubers to secondary infections by pathogens. In view of that, farmers were therefore taught to reshape ridges by gathering the top soil to cover exposed tubers and to keep the mounds or ridges in shape regularly. They were also made to know that they could reduce cost by combining this weed control with the earthen up. Farmers were advised to carry out earthen up process gently because it can also create wounds on the developing tubers which can lead to secondary infection by pathogen to the healthy plants.

The training was a timely one because farmers were able to practice some of the Good Agricultural Practices learnt on their Minisett demonstration fields. It was observed that, due to high cost of labour farmers are not able practice some of the activities such as weeding at the right times. Farmers were then advised to practice the use of pre-andpost-emergence herbicides to reduce the number of times weeding is done.

As a way forward, farmer fields will be continuously monitored to ensure that proper activities are done to ensure good yield. Evaluation of field will be carried out until plants have completely senesced.

Pre-harvest training as well as training in harvesting, postharvest handling and storage in improved storage structure will be carried out. Two Improved storage structures will also be constructed, one for each of the districts.

3.12 Development and Printing of Competency Based Training Manuals

As part of efforts to keep Seed Companies abreast with best-practice in both technical production and business management and thereby become efficient, effective and profitable, the ECoSIB team in collaboration with its partners have developed and printed training manuals to be distributed to all seed incubatees to serve as a guide. These manuals are the Seed Enterprise Development Management Manual and Technical training manuals on seed yam and seed maize production

3.12.1 Seed Enterprise Development Management training manuals

Seed business development training manuals have been redesigned and developed to a portable easy-to-use size to serve as reference/work instruction seed SMEs and technicians to inculcate best business culture. Increasing the availability and accessibility of high quality seeds to smallholder farmers and building their technical and managerial capacities on same are the sine qua non to achieving seed security, and hence, food security.

Often times, seed SME's lack the business management acumen to deliver on quality, profitable and sustainable ventures for themselves and their customers. The training manuals seek to stimulate a change in farmer's attitude by (i) creating business-minded farmers empowered to plan, produce

and market their produce for profit, and (ii) been able to efficiently and effectively manage their constituents – the smallholder farmers.

In these training manual, there is a deliberate attempt to take seed SME's through a **6- linkage approach** to growing their businesses and sustaining their progress. The six linked topics are;

1. **Effective Planning**
2. **Efficient Records Keeping**
3. **Proactive Customer Profiling and Servicing**
4. **Top-notch Seed Marketing and Market Linkages**
5. **Prudent basic Accounting tools, strategies and Financial Management**
6. **Proactive Savings and Investments**

3.12.2 Seed Production training manuals

Fifty (50) units of user friendly technical training manuals, containing in-depth practical information on hybrid seed production, seed production techniques and yam seed production, were printed for distribution to incubatees.

Competency Based Training Manual (CBT)

3.13 Partner's implementation Review Meeting

An ECoSIB partner's review meeting was held on the 26th August 2016 at the Office of the Provost, College of Agriculture & Renewable Natural resources, KNUST. The objective of the meeting was to review the project's implementation, identify challenges and discuss the way forward. In attendance were representatives of KNUST, GGLDB, Agri-Impact and ECoSIB.

3.13.1 Some notable upshots from the meeting are listed as follows:

- A decision was made to upstage accentuate the handholding and mentorship component of the project, hence, specific mentors were assigned to Seed Companies to coach them in both technical and business management.
- Partners agreed to use the one-on-one handholding session to also conduct independent baseline data collection of seed SMEs to generate business information that will help track their performance and measure project impact
- KNUST affirmed their commitment to develop a Seed Enterprise Development Management manual to be distributed to the Seed Companies to serve as a best-practice guide
- GGLDB announced their on-farm visits to the Seed Companies within the quarter to handhold them on their fields and train them on-site on technicalities.
- In-depth discussions were held on managing partners expectations with regards to finance and deliverables
- The issue of the lack of capacity of ECoSIB to admit potential applicants for incubation service was discussed and members renewed their commitment to strengthen sustainability plan to scale-out.
- On reporting, partners agreed to adopt the 'return to report' approach to support implementation of agreed goals

Consortium members renewed their commitment to work within deadlines to ensure successful implementation of the project to achieve its objectives.

Participants at the partners meeting

3.14 Profile of Partners and Mentors

In line with our objective to provide technical and managerial support to seed SME's through handholding and coaching, partnering institutions and mentors have been categorized and assigned to specific incubatees within their geographical area for ease of access.

This exercise was to identify the needed knowledge, skills, talents, expertise, experience and resources and match them to the specific needs of the incubatees for effective coaching and mentorship services to ensure continuous improvement in their businesses.

3.14.1 Profile of technical Mentors

1. **DR. FRANCIS KUSI**

Francis Kusi had his secondary education at Juabeng Secondary School in Ashanti Region. He has been working with CSIR- Savanna Agricultural Research Institute since 1993 to date. He holds National Diploma in General Agriculture, BSc. Agriculture (Crop Science), M.Phil in Entomology and

PhD in Crop Science all from the University of Ghana Legon. He is proud to be associated with the great achievements of CSIR-SARI in the field of grain-legume improvement (Cowpea, Soybean and Ground nuts) and Crop protection (Entomology and Pathology).

Dr. Kusi is currently the Deputy Officer In-Charge of the Manga Station of the CSIR-SARI in Upper East Region. He has been the Upper East Regional Coordinator of AGRA Soil Health Projects from 2010 to date. Under his leadership the AGRA Soil Health Project has made a great impact in increased maize, soybean, groundnut and cowpea production as well as strengthening of the capacities of Farmer Based Organizations and Agricultural Extension Agents in the region.

He has been involved in several technologies transfer activities; Training of Agricultural Extension Agents (AEAs) and farmers in Integrated Pest Management of vegetables, cereals, legumes and stored products. He is also a trainer of AEAs in facilitation of Farmer Field Business School and installation and management of field demonstrations.

Dr. Kusi has attended several international scientific conferences and workshops in Asia, America and Africa and has several publications to his credit. By dent of hard work, he has just been promoted to Senior Research grade effective July, 2016.

2. **Dr. KwadwoObengAntwi**

Kwadwo ObengAntwi is currently a Principal Research Scientist/Maize Breeder at the Crops Research Institute, CSIR, Kumasi, Ghana, where he has worked for the past 40 years. His professional objective is to contribute to increased productivity of maize in Ghana through development of improved composite and hybrid maize varieties that combine high and stable yields with better nutritional quality and tolerance/resistance to the major biotic and abiotic stresses in the country. He has, in association with other colleagues, developed and released 24 open-pollinated and hybrid maize varieties for commercial production in Ghana since 1997. He currently has 26 journal publications to his credit.

Dr. ObengAntwi holds a Diploma in Horticulture, from KNUST, a B.Sc. (Hons) Crop Science, also from KNUST, and an MSc Plant Breeding, from the University of Guelph, Ontario in Canada and a PhD Agriculture, University of Reading in UK.

3. **Dr. Francis Appiah**

Francis Appiah is the vice Dean of Faculty of Agriculture at the Kwame Nkrumah University of Science and Technology (KNUST), Ghana. He holds a PhD degree from KNUST. His research cut across fields including Food Science, Postharvest Technology, Nutrition, Horticulture, and Community Education. He is the Vice President of Ghana Institute of Horticulturists (GhIH) and a member of the Quality and Postharvest Horticulture Commission of the International Society of Horticultural Science (ISHS).

Dr. Appiah has 28 scientific publications in reputable journals and is a reviewer for 12 scientific journals. He is an experienced consultant in the food industry. He has convened several scientific conferences in including the 13th Scientific Conference of the Ghana institute of Horticulturists (PROVAF 2012) in collaboration with The Food and Agriculture Organization (FAO) and Global

Horticulture Initiative (GLOBALHORT) in Accra, Ghana. He has special interest in promoting scientific research and dissemination. He was a Co-convener of the International Symposium on "Horticulture in Developing Countries and World Food Production" held in Brisbane, Australia in 2014 as part of the International Horticultural Congress (IHC2014). He teaches at the Department of Horticulture, KNUST.

3.14.2 Profile of Business Mentors

1. Mr. Daniel Acquaye

Daniel Acquaye is an Agribusiness Development and Value Chain Expert. He has served as consultant to the several local and international institutions including the Millennium Challenge Corporation (MCC), USAID, ECOWAS, Comprehensive African Agricultural Development Programme (CAADP), and United Nations Development Programme (UNDP) and has also served as Principal Investigator for a number of projects including Partnership for Food Industry Development (PFID) and Horticultural CRSP.

Mr. Acquaye consults for the Millennium Challenge Corporation (MCC) to assist in agricultural project design and implementation in Burkina Faso. Under USAID funded programmes, Mr. Acquaye has conducted market assessments on high value horticultural and natural plant products in countries such as Guinea, Uganda, Zambia, Malawi, Mozambique, Cameroon, Swaziland, Liberia, Ghana, and Senegal, Nigeria, Cote d'Ivoire and has helped in the establishment of several projects in some of the countries. He has also developed several investment briefs and horticultural investment plans for private companies in Ghana and Liberia.
Mr. Acquaye holds Master of Business Administration (Project Management) and Bachelor of Science, Agriculture (Agronomy).

2. Dr. Alex Ariho

Dr. Alex Ariho holds a PhD in Agribusiness and development management. Dr Ariho is an expert in Global agribusiness Incubation, value chain development and business management. He holds a master's degree in Development Management, Bachelor's degree in Business Administration with specialization in Strategic Marketing and a diploma in business and public administration among other relevant qualifications.

Dr. Ariho has extensive professional hands on experience in Agribusiness Incubation Management and business development for agribusiness value chains with 15 years exposure in development and partnerships management. He has worked with the Private Sector, International Development Organizations, Universities and Research Institutions in Africa, Asia and Europe in senior management positions since 1998 to date.

Dr. Ariho has a rich knowledge and expertise in development finance management and coordinating multi donor funded programmes and business initiatives supported by World bank, African Development bank, African Union, Africa India Innovation fund, Forum for Agriculture Research in Africa (FARA) Danida, Help A child Netherlands, Nuffic, USAID, European Union (EU), UNDP, AGRA, GORTA Ireland, Self Help Africa, Food and Agriculture Organization, ASARECA, World Wide Fund for Nature(WWF) and African Governments others .

Dr. Ariho is one of the initiators and developers of several programmes and businesses in Africa, such as AAIF and AAIN, and has been responsible for coordinating private sector, African Universities and Sub Research Organizations as well as African governments to delivering on Comprehensive Africa Agriculture Development Programme (CAADP) agenda based on UnIBRAIN model aimed at youth, men and women job creation in Africa through incubation. He is currently one of the brains behind the development of business model for youth employment creation an initiative of African Development Bank and IITA-ENABLE.

Dr Ariho is a visiting lecturer to some renowned Universities across Africa. He is the Chief Executive Officer of African Agribusiness Incubator Network (AAIN) and coordinator of FARA UniBRAIN responsible for job and wealth creation through incubating incubators in 54 African countries.

3. DR. BEN KWAKU BRANOH BANFUL

Ben Kwaku Branoh Banful is a Senior Lecturer at the Department of Horticulture, Kwame Nkrumah University of Science and Technology. He holds a PhD in Agronomy from the University of Ghana, Legon, Ghana. He has over 26 years' research experience with focus on seed agronomy, crops production and postharvest systems of crops. He also has a strong background in business plan development and he is an expert in the value chains of horticultural crop commodities. He has exceptional organisational, facilitation and communication skills coupled with astute leadership qualities. He has sixty (60) scientific publications comprising high quality journal articles, edited conference papers and production handbooks/manuals to his credit. He is a scientific reviewer for a number of reputable international and local journals and also serves on the Editorial Board of several reputable journals. Over the years, he has been involved in the training of Farmer-Based Organisations and groups to enhance their capacity for increased productivity in cross-cutting disciplines such as business development skills, data management and interpretation, conflict management of productive ventures, health and safety on farms as well as the improved crops production techniques and post-harvest management systems of crops.

Dr.Banful also has considerable management experience spanning sixteen (16) years at the Institutional and National levels. He is the immediate past Head of the Department of Horticulture, KNUST, Kumasi. He is a member of the International Society for Horticultural Science, Ghana Institute of Horticulturists and the Ghana Science Association.

His research interests include: seed production and management, soil fertility management systems and biostatistics. His hobbies include: mentoring, counselling and reading.

4. Mrs. Juliana Asante – Dartey

Juliana Asante-Dartey is the country director for ASNAPP (Ghana and Liberia) and has extensive experience working in varied roles with elements of business analysis, project management and coordination. She has expertise in managing and facilitating agribusiness value chain projects, project conceptualization, financial budgeting and budgetary control. She has over 14 years' experience in business and enterprise development, market facilitation, procurement planning and implementation, training and capacity building. Mrs. Asante-Dartey has a strong commitment to 'gender mainstreaming' that has led to development of Agribusiness projects/firms for International

Organization (USAID, ICCO, UNDP, ECOWAS) and SME's with a larger percentage of beneficiaries being females.

Mrs. Asante-Dartey continues to provide business-to-business linkages for SME's by providing coaching and mentoring. In her role as an agribusiness value chain facilitator, she has worked with over 6,000 women across Ghana, Liberia and Burkina Faso to build their capacity to become active value chain participants, developed and grew new agribusinesses, increased their incomes and socio-economic well-being. She specifically worked with women groups to produce over 80,000MT seeds, butters and oils in 8 communities across West Africa for over 5 years valued at over $55m.

Juliana Asante-Dartey holds a Master's in Business Administration (International marketing & Finance) and Bachelor of Science in Agricultural Economics.

5. Mr. Kingsley Jectey

Kingsley Jectey is an astute Business Manager with extensive experience in Business Planning and Strategic Resource Mobilization and Management. With over 13 years' progressive work experience in business management, he has demonstrated proficiencies in identifying growing opportunities, allocating resources to take advantage of trends, process improvement, profit maximization and cost control.

Currently he is a Business Manager at Agri-Impact Consult, where he works with seed companies to develop and operationalize effective production, marketing and finance systems and generally specializes in agribusiness development.

He holds BA in Economics from the University of Ghana, Legon and an MBA in Finance from GIMPA.

6. Mr.Larry Amekuse

Larry Amekuse is a Value Chain/Development Specialist with extensive experience working in varied roles with elements of business analysis, project management and project coordination. He has expertise in managing and facilitating agribusiness value chain projects, project conceptualization, designing M&E indicators as well as undertaking mid-year reviews. He has 10 years' experience in business and enterprise development, market facilitation and implementation, training and capacity building.

Mr. Amekuse has served as a consultant to several local and international institutions including the TRIAS (a Dutch based NGO), USAID, SPEED Ghana, IFDC, UNDP/AFIM and ICCO from the Netherlands. He has successfully executed several high value horticultural initiatives in West Africa that focused on increasing market access/developing market, finance and employing ICT for increased profitability to key value chain actors in the horticulture and NTFP sectors.

In his role at ASNAPP, he has secured funding for projects in Ghana, Burkina and Liberia valued at over $5m in 3 years and worked with over 6,000 producers and SME's to build their capacity to become active value chain participants, developed and grew new agribusinesses and increased their incomes valued at over $30m for the period.

Larry holds a BSc. (Hons.) Agriculture from KNUST and an Executive MBA in Project Management from the University of Ghana.

7. Mr. Gideon Mankralo

Gideon Mankralo is a Proactive Business Strategist, successful in developing and implementing business and technical models, forging strategic partnership plans and managing diverse business constituencies with robust approach towards research and evaluation. He has extensive experience in Planning, Marketing and Management, and his core skills include development of strategy and brand architecture, identifying market opportunities and using unique consumer insights to develop relevant market penetration strategies and brand mixes.

Gideon has conducted several studies on Seed in Ghana, and has facilitated several partnership initiatives to increase the profitability and market share of SMEs in the Seed Sector by developing new markets, penetrating into various sectors of the agro-value chain and developing strategic partnerships across with key stakeholders in the Country. Additionally, Gideon has coordinated numerous training and capacity building programs for smallholder farmers across Ghana, providing mentorship and coaching services to them on best management practices and identifying and harnessing market opportunities.

Gideon holds a Master of Public Administration from GIMPA, and a Bachelor of Arts in English and Philosophy, from the University of Cape Coast (UCC). He is currently the Business Development and Partnership Specialist at Agri-Impact Consult

3.15 Hybrid line seed generation/multiplication and distribution

The Grains and Legumes Development Board team guided the incubatees to produce a total of 65kg to produce Mamaba hybrid (foundation) seeds from these parental lines in the up-coming 2017 major planting season.

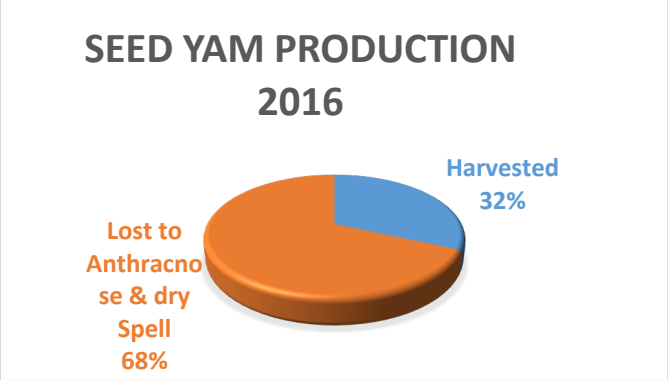
Yields from the parental lines were encouraging considering time of planting and total land area covered. In all a total of 65kg of seed has been generated. The detail yields realized from the individual parental lines are Entry 5 (20kg) and GH 110 (45kg).

For incubatees to receive adequate parental lines for hybrid seed production, the Board planted 14 acres of different hybrid parental lines in September 2016 at Afraku Seed farm. The generated seeds served as hybrid parental lines for distribution during the 2017 major season plantings. The fields performed well as a result of thethen favourable weather and t the plants enjoyed good weather and ensure good yields. Field maintenance was effective in terms of weed control, stem borer control and fertilizer application well executed.

3.16 Support to Seed Yam Entrepreneurs

ECoSIB trained 20 Seed Yam Enterprises in Seed Yam Production using Minisett Technology and Post-Harvest handling in East Gonja and Tolon districts in Northern Region of Ghana.

The projects supported the yam enterprise farmers in the two districts (East Gonja and Tolon) with improved yam storage structure. The improved yam storage structure is a modifications of the local yam structures. The improvement eliminated the limitation of the local structure which makes it prone to rodent attack, poor roofing which makes it not suitable for yam storage during the rainy season. The improved structure took advantage of the suitability of the thatch structure for yam storage even during the heat period and improved it to eliminate rodent attack and properly roofed it to prevent rain water from entering it and also to extend the shelf-life of the tubers from 3 to 7 months.



In 2016, most of the farmers experienced poor harvest compared to the number of setts planted. Out of plant population of 8,021 only 2,539 was harvested representing 31.65%. 5,482 plants were lost to dry spell and Anthracnose disease which caused early senescence of the plant.

ECoSIB would, in future engagement train the farmers to adopt integrated pest management (IPM) strategies to control pest and diseases and also strengthen them to make use of water conservational practices for moisture for plant use when rainfall pattern is not favourable.

3.17 On-Field Technical Handholding and Mentorshipfor Incubatees

Central to ECoSIB's delivery model is technical handholding and mentorship for the incubatees. This is to ensure that the skills and technologies taught the incubatees during the classroom sessions are actually practiced, commercialized and scaled. It is also to provide an avenue for the incubatees to have a hands-on interaction with their mentors on their fields, to discuss technical challenges they are facing on their fields and to together explore expert remedy measures. The field visit also focused on technical evaluation of farm structures, field production, field maintenance and general overview of their ongoing seed production activities.

Hence, the technical mentors on the ECoSIB project, drawn from the GLDB and CRI paid working visits to the Seed Companies, to provide them with on-site technical handholding and training, and also to monitor their field activities. All the 15 seed companies/incubatees were visited during the period.

ECoSIB Technical team with Mr. Adu Gyamfi, of Agri Commercial Services Ltd on his field at Wenchi

Dr. Asuboah with Mr. Apraku of PAG Farms at his storage facility at Wenchi

Dr. Asuboah stressing a point to Ms. Martha Bruckner of Bruckner Farms on her farms at Ejura

Dr. Asuboah assessing the fields of Asempa Farms in Kumasi

3.18 On-Site Business Handholding and Mentorship

Over the project period, ECoSIB partners provided handholding services including on-site technical support; on-site market facilitation and business management to the SMEs. Partners visited SMEs fields to assess performance and compliance to production protocols and offer on-site technical

advice and services. Through this approach, seed companies have put in place management systems




for their operations

3.19 Seed Market Survey and Development

In order for ECoSIB to achieve its goal of increasing the availability and accessibility of superior quality seed to smallholder farmers in Ghana, ECoSIB has been engaged in stakeholder consultations with its partners, especially, NASTAG, umbrella association for seed producers in Ghana, to identify the key challenges facing seed SMEs. Indicators pointed to marketing as the major challenge.

Efforts to identify, assess and strengthen the constraints, bottlenecks and loose-ends in the seed marketing system so that smallholder farmers have easy access to seed in Ghana, led to strategic visits and consultations with seed SMEs being incubated under ECoSIB to unravel the issues surrounding seed marketing in Ghana.

The objectives of the consultations included, but were not limited to, the following;

- Identification of current seed marketing system and structure
- Analysis and assessment of current seed marketing systems and structure
- Identification and examination of the various seed distribution channels to develop effective marketing strategies
- Facilitation of the creation of an efficient and effective seed marketing system and structure
- Supporting seed market access information strategy development for Ghana
- Mapping and aggregating potential demand for improved seeds for Commercial and Lead Farmers in the operational area of the seed company

Using an exploratory research design, hinged on structured questionnaires and interviews, the ECoSIB team visited the homes, farms, and workplaces of actors in the Seed Value chain, comprising

15 seed SMEs, 3 major agro-input dealers, Regional and District Agric Offices, PPRSD Regional Offices, and some radio stations.

3.19.1 Summary of Findings

At the end of the study, the following 10 findings were made;

1. 7 mostly cropped Seed Maize Varieties: It was uncovered that the 10 seed producers cultivated seven (7) main seed maize varieties in 2015 (out of the 24 varieties released in Ghana). Total output for the seven (7) seed maize varieties produced in 2015 was 20,343 mini bags of 45kg (915.44 tons) of which 96.85% are sold with 3.15% carried over as stock.

2. Marketing through Agro-Input dealers: One notable finding this study made was that, a large proportion of the seed produced in 2015 were marketed through Agro-Input dealers. Of the various channels available for seed distribution and marketing, Agro-Input dealers were identified as the most effective and most preferred outlet for the seed companies. This was so, as the study uncovered, because the Agro-Input dealers extended credit/financial facilities to the seed companies in exchange for their produce. To avoid capital lock-up by this arrangement, some of the Agro-Input dealers facilitate educational and awareness creation of the use of improved seeds for FBOs through their branches across the country. Notable among them is, Badu Kaakyeri, an Agro-dealer in Kumasi who has 7 other sales outlets in Ashanti, Central, B/A and Western Regions and regularly organizes educational/awareness creation workshops for FBOs.

Note: The challenge in this arrangement for the seed companies is that they sell at the price of the Agro-Input dealer, a price which may not be beneficial to the seed producer, and the very reason why Effah Farms is considering pulling out from the business relationship with Waf Agro in Techiman.

3. Faking and Adulteration, and other Challenges: Seed companies that enter into consignment stock arrangement with Agro-Input dealers, especially the smaller ones, encounter problems of credibility. Some Agro-Input dealers adulterate the seed with grains and repackage before selling causing disloyalty among farmers for given brands of seed. Faking and adulteration is cited as one of the main problems of seed marketing in Kumasi. Another problem is lack of storage facilities. Seeds and chemicals are stored side by side at the Agro-dealer's shops and exposed to sun for extended period. This reduces seed viability.

4. Direct Selling: Direct selling to Commercial Farmers/Aggregators is an avenue that is not utilized much. Aggregators buy grains in bulk and have FBOs that produce for them. Some of the Food Processors and Feed Meal Companies for instance Premium Foods, Avinash, Ghananut, Amplifies Ghana etc. also have their own aggregators. We have contacted Ghana Grains Council to give us a list of FBOs in Ghana with their contact details.

Note: Direct selling to lead and smallholder farmers in the operational areas of the seed companies is one of the many ways available for seed companies to sell their produce. Most farmers grow small acres of maize and therefore buy small quantities of seed, therefore no individual farmer or even group of farmers account for a significant proportion of seed company's total sales. Because their seed requirement is small, seed companies have not exploited the proximity advantage to build sustainable relationship with this group of customers. Only one of the ten (10) companies has order/supply arrangement with clients.

5. Marketing through MOFA: Marketing seeds through MOFA extension is done in one of two ways:

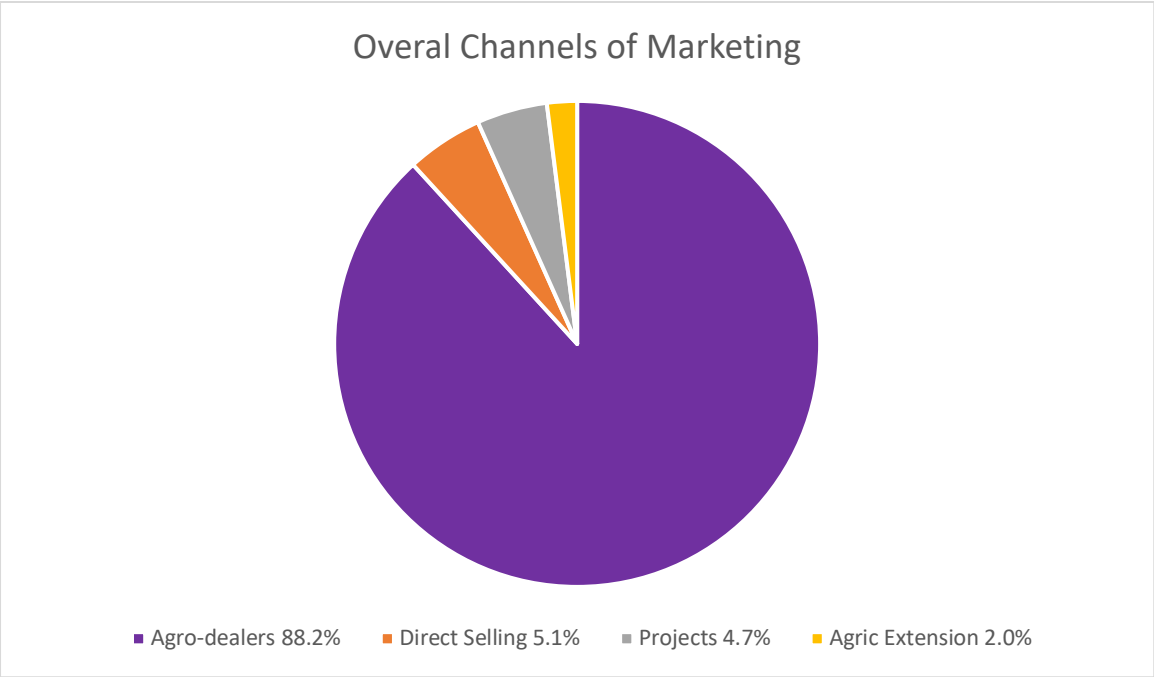
a. By official arrangement (MOU) with the Ministry of Food & Agriculture. This is not attractive to the seed companies because of the bureaucratic procedures they have to go through.
b. Some of the seed companies unofficially engage the MOFA extension officers on the sidelines to market their seeds for them. Experience has shown that proceeds from such sales are mostly not remitted to the seed companies. It is an option all the seed companies are shunning away from.

6. Promotional tools: The promotional tools commonly used by the seed companies are:
   - Field days
   - Demonstration
   - Radio advertisement
   - Samples
7. Frequency of the release of new varieties stifles adoption: It was noted that numerous varieties of seeds are released onto the market without adequate farmer education. It is worth mentioning that, giving farmers options by putting on the market different seed varieties periodically is a good idea, but it becomes problematic for the seed companies to market when those varieties bear different names and the characteristics information on them are scanty. It was realized that Agro-Input dealers are not sufficiently knowledgeable about the characteristics of seeds they carry in their shops to be able to educate smallholder farmers when they visit their shops to buy seeds. Some Seed companies explained that, just when a new variety is promoted and gaining recognition by farmers, then another new variety is released, which distorts promotion and adoption of the previously released variety. Farmers opined that old varieties should rather be upgraded and improved upon to allow for continuity.

Note: Farmers are slow to change and so they use old varieties because of security. They trust the old seeds.

8. Seed Subsidy: Seed Companies explained that government subsidy on seed is only a political tool because improved seeds are not subsidized to promote its use and adoption, yet old varieties are the ones that are mostly subsidized, for example Obatanpa.
9. Unavailability of some foundation seeds: The Seed Producers noted that mamaba for instance has gained prominence yet foundation seeds of the variety was lacking though farmers are requesting for it.
10. Double Standards: It was noted that most of the nucleus farmers have started producing their own seeds for cultivation.

3.19.1.1 *Overall Channels of Marketing*



In Summary, this study noted that after harvesting, cleaning and packaging, the seeds are ready for distribution. Seed is mostly sold through agro-dealers (88.2%) and sometimes directly to farmers (5.1%). It is not uncommon for some Projects (4.7%) to purchase certified seeds and give it to farmers benefiting from their interventions. Sales through Agricultural Extension Officers is also minimal (2.0%). Seed is not usually sold on credit by seed growers to farmers (12.7%), it is however common (87.3%) for agro-dealers to access seeds either on credit since it would take them a relatively shorter time to pay back or by pre-financing the production and having the seeds as payment for the credit advanced to the seed company. A few of the medium sized seed companies are investing in developing negotiated/contract supply with commercial farmers and aggregators (who supply improved seeds to out-grower schemes as part of input credit support) and to produce by order.

Distribution is concentrated in the major regional and district capitals and availability in remote production areas, where most farmers can be found is very limited. Obatanpa is the most stocked improved maize seed with a few agro dealer shops in major regional capitals stocking limited quantities of newer OPVs like omankwa.

Only a few companies advertise seed availability through the radio. The seeds are being marketed through their existing distribution channels of the agro input firms and companies like Wienco are also selling through contract out-grower schemes where the seeds are supplied along with other agro chemicals as input credit and the company buy back the output (grain) and pay the farmer after taking out the cost of inputs at agreed prices.

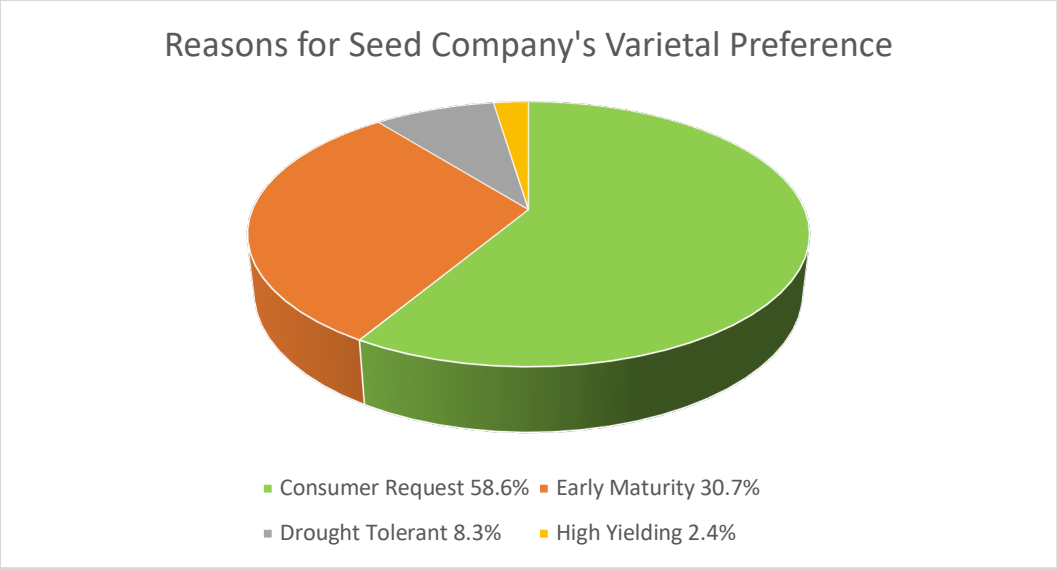
3.19.1.2 Seed Company's output of various varieties and corresponding sales volume – 2015

SEED COMPANIES	VARIETIES IN 2015	LAND SIZE IN ACRES	OUTPUT 2015	QTY SOLD	STOCK	% OF OUTPUT CARRIED OVER	% OF OUTPUT SOLD
Lexbok	Obatanpa	20	88	74	14	16	84
	Sanzal-sima	10	77	69	8	10	90
Rural Innovations	Omankwa	10	40	32	8	20	80
	Abrohemah	5	20	10	10	50	50
	Sanzal-sima	10	65	65	0	-	100
Heritage seeds	Tintim	7	60	60	0	-	100
	Obatanpa	10	324	324	0	-	100
	Abontem	5	20	20	0	-	100
	Wang-data	10	170	170	0	-	100
	Sanzal-sima	20	600	600	0	-	100
Effah Farms	Omankwa	50	800	800	0	-	100
Pag Farms	Obatanpa	50	700	250	450	64	36
	Omankwa	20	350	200	150	43	57
Ababio Farms	Obatanpa	50	640	640	0	-	100
Agri-Commercial	Obatanpa	50	2,880	2,880	0	-	100
	Mamaba	5	133	133	0	-	100
Pee Farms	Obatanpa	250	6,600	6600	0	-	100
	Abontem	80	2,100	2100	0	-	100
	Aseda	50	1,300	1300	0	-	100
	Mamaba	50	1,300	1300	0	-	100
Bruckner	Mamaba	100	1,300	1,300	0	-	100
Asempa Farms	Obatanpa	70	654	654	0	-	100
	Mamaba	35	122	122	0	-	100
Yonifa Farms	Obatanpa	20	0	0	0	-	0
Glaco Farms	Obatanpa	20	180	180	0	-	100
Benzene Farms	Obatanpa	15	220	150	70	-	68
	Omankwa	10	150	50	100	-	33
Victory Farms	Obatanpa	40	600	600	0	-	100
	Abontem	5	30	30	0	-	100
Innovations Village	Obatanpa	20	280	280	0	-	100

3.19.1.3 *Total output of various varieties and the corresponding sales volume – 2015*

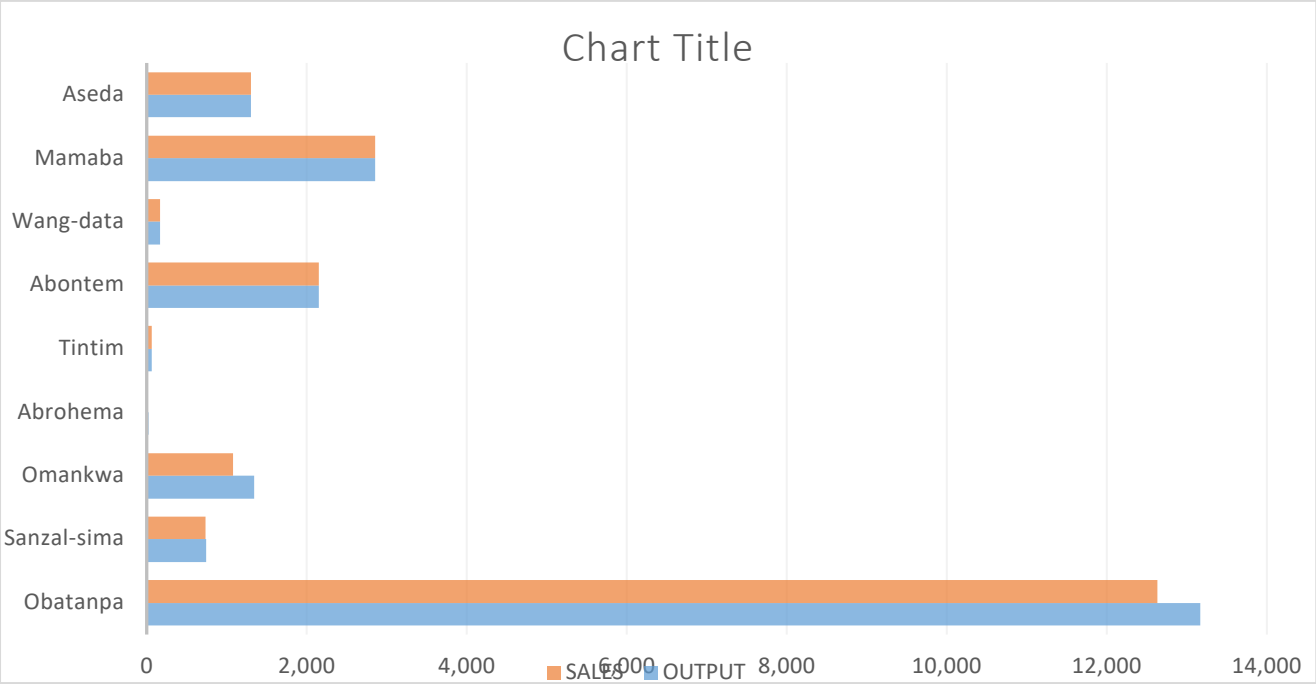
	OUTPUT	SALES	STOCK 2015	% OF OUTPUT CARRIED OVER	% OF OUTPUT SOLD
Obatanpa	13,166	12,632	534	4	96
Sanzal-sima	742	734	8	1	99
Omankwa	1,340	1,082	258	35	81
Abrohema	20	10	10	10	50
Tintim	60	60	-	-	100
Abontem	2,150	2150	-	-	100
Wang-data	170	170	-	-	100
Mamaba	2,855	2,855	-	-	100
Aseda	1300	1300	-	-	100
	21,803	**20,993**	**810**		

3.19.1.4 *Reasons for seed Company's varietal preferences*



From figure 5 above, results of the survey indicate that farmer preference (58.6%) is an important factor in determining the type of variety that is produced by the seed growers as presented in Figure 2. Early maturity is also an important characteristic (30.7%) in selecting varieties to grow. Long duration varieties cannot be processed and sold to grain producers in the same cropping season even under irrigation, so early maturing varieties are preferred in order not to miss the season. High yielding varieties are obviously high rewarding and are therefore an important trait. Varieties that are able to withstand harsh weather conditions (2.4%) are also preferred

3.19.1.5 *Output of seed varieties with corresponding sales volumes – 2015*



3.19.2 Recommendations

This study recommends the following;
First, it was realized that national commitment to promote the adoption and use of improved varieties was non-existent since only old varieties, such as obatanpa, are the ones subsidized by government. This study recommends that there should be a national consciousness to subsidize improved seeds to effectively promote adoption. Similarly, to bolster continuity and ease of adoption, it is recommended that the older varieties which farmers are familiar with must constantly be improved upon instead of releasing new varieties all the time. Also, that parental lines must be preserved for re-production to ensure availability.

This study suggests that there should be a reasonable time interval between variety releases to allow for effective promotion and adoption of previously released variety since it was noted that seed producers' effort to convince farmers to adopt varieties are cut short pre-maturely with the intermittent release of newer varieties.

Furthermore, it was realized that most companies did not have seed conditioning facilities and relied on the obsolete equipment of PPRSD and GSID. The Brong-Ahafo region as the major production belt for both grain and seed maize had no seed conditioning facility. The lack of drying and storage facilities is forcing most seed producers in the South to shift major production to the minor season where drying conditions are more favourable. Hence, there is the need to build more cold rooms, ware houses, and install processing and packaging equipment in the regional and district capitals to help in the processing of seeds. Government could provide these services at a fee or provide seed companies with grants to acquire such facilities.

Seed should be packaged in different weights ranging from 1 Kg to 50 Kg in order to meet the needs of all categories of farmers.

Significant amount of seed is sold through Agro dealers. However, most of the Agro dealers lack the capital to stock seeds especially when seed companies do not provide credit or consignment stock. They also lack knowledge of the characteristics of the seed they sell to be able to educate farmers who visit their shops. Therefore, providing credit and training to Agro dealers on varietal characteristics and good seed handling practices will boost seed sales and encourage more entrants into the seed retailing business therefore widening the seed market outlets farther to the rural communities to enhance availability and accessibility by the smallholder farmer.

3.19.3 Market Facilitation

ECoSIB identifies two main activities in facilitating market linkages through the Agro Input dealer

1. Knowledge development. Matching supply and demand of improved seed is not enough for sustainable market linkages as smallholder farmers can only produce with the right inputs and intensive agronomic extension support.

2. Brokering by way of developing a web-enabled interactive database allowing smallholder farmer groups/FBOs to indicate their need for seed varieties and seed companies to share information on their produce. ECoSIB is supporting NASTAG to develop an interactive website for the seed SMEs and smallholder farmer groups to match demand and supply of improved seeds.

Through project intervention, Benzine Farms and Pag Farms were able to sell their stock.

BENZINE FARMS

2015	OUTPUT	SOLD	STOCK
OBATANPA	220	150	70
OMANKWA	150	50	100

2016: ECoSIB brokered market with Victory Volta Agro and Dolin Agro in Kpando and Ho respectively.
Outcome: Stock fully sold. Permanent supply arrangement made.

PAG FARMS

2015	OUTPUT	SOLD	STOCK
OBATANPA	700	250	450
OMANKWA	350	150	200

2016: ECoSIB brokered market with WAF Agro in Techiman.
Outcome: About 70% of stock sold.

3.20 Farm Assessment

As part of ECoSIB's resolve to touch base with the issues along the seed value chain, and to provide its incubatees on-field technical and management handholding, monitor their activities, collate their challenges on the field and make tailored interventions to assist them, the ECoSIB team embarked on a farm assessment trek.

The team visited one of its incbatees, the Innovations Village Seed Company (IVSC) in the Central Region and a Private Breeder, Legacy Crop Improvement Centre (LCIC) in the Eastern Region. At IVSC, the team assessed how well the farm was implementing the technical knowledge taught from the training workshops and commercializing technology. The team made relevant technical and managerial interventions and recommendations to the farm based on observation from the farm.

At the LCIC, the team embarked on an experience sharing schedule to discuss best farm-practices and collate data on how to strengthen the seed value chain in Ghana. The team made notable observations on good farm practices on the breeder's farm which it is commercializing among its incubatees.

Manager of LCIC conducting ECoSIB team around his farm

Snapshots of the Parifaco Breeder Seeds farm of LCIC

3.21 Seed Business Quality Systems and Traceability Audit

As part of the partnership arrangement, Ghana Seed Inspection Division (GSID) was tasked conduct quality assurance audit of the 15 seed companies with the view to integrate a functioning quality assurance system into the production process of the seed SMEs to ensure their conformity to certification standards. Specifically, GSID was mandated to evaluate the production process of seed SMEs to identify quality assurance gaps. Information generated from the quality audit studies is to inform ECoSIB on further areas of support required to make the seed companies meet registration requirement and improve upon their productivity and competitiveness.

Approach and Methodology

Fifteen Seed Companies currently supported under ECoSIB were selected for quality assurance audit. Tools used for assessment included

i. Registration of Seed Producer (Application, processing of client application, registration of client
ii. Field Registration (land, cropping history, crop, farm structures, equipment, machinery, labour force and out-grower)
iii. Field Inspection (Request for inspection, Inspection and field labelling)
iv. Post-harvest (seed processing, seed sampling, seed testing and seed certification)

3.21.1 Gallery of Existing Farm Structures and Equipment found on Incubatees Farm






3.21.2 Farm Sizes of Seed Companies Audited

The total farm size of Seed SMEs being supported by ECoSIB is estimated at 1,470 acres from 12.5 to 250 acres as shown in figure 1. They are located in Brong Ahafo, Ashanti, Eastern, and Volta and Greater Accra regions.

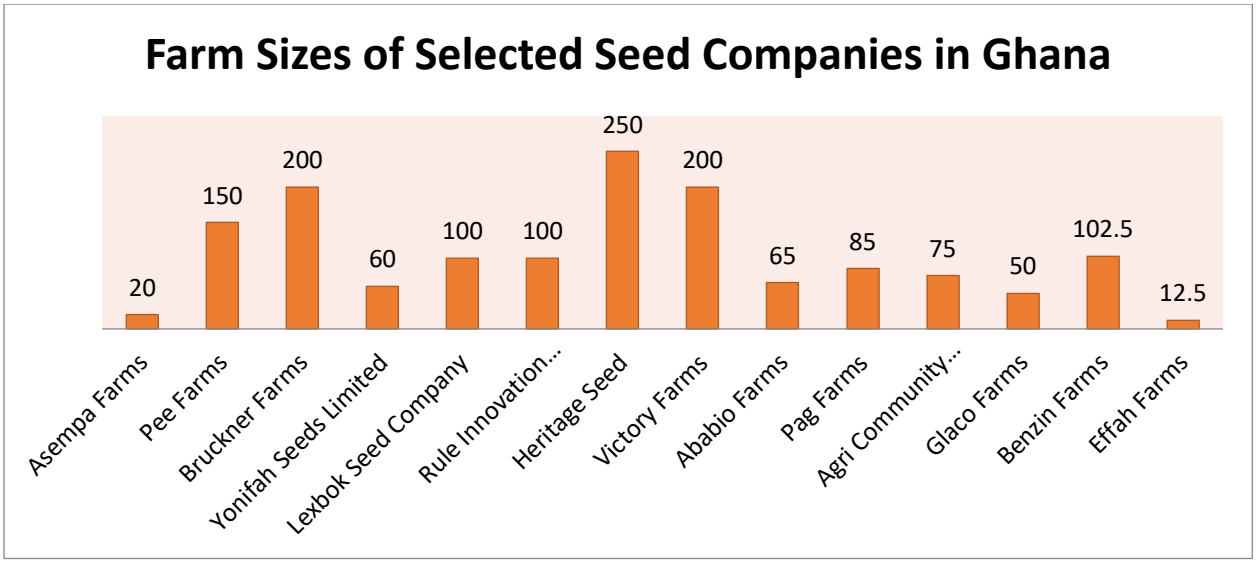


Figure 1: Farm Sizes of Seed Companies

3.21.3 Potential Companies for Support and Growth

Based on observations and initial analysis of the audit data, GSID proposes a possible intervention into three broad support considerations;

First consideration is the current capacity of the seed enterprise to produce quality seed and fulfill the requirements of the law. The criteria used in ranking the companies include; The registration status of seed enterprise with the Ghana Seed Inspection Division; Infrastructure and equipment availability and functionality for seed production; Level of knowledge and experience in seed production and handling and Availability and Location of lands for seed production.

Second consideration is the prospect of the seed enterprise to evolve into a vibrant seed company. The criteria used for the ranking includes; the legal status of the enterprise; Additional infrastructure to support the logistics and operational activities; Ability and willingness to use outgrowers; Current documentation and record keeping abilities and Ability and desire to employ highly qualified technical and financial staff.

Third consideration is the urgent support required by seed enterprise to improve current operations. The criteria used in ranking the enterprises includes; Current low level of operation; Challenges with liquidity; Skills level of staff; Support received from external funding sources / NGO's/Development Partners, etc and training received by staff.

Below in figure 2 is the ranking of the seed enterprises according to the three broad areas for consideration. Even though the ranking was not based on any quantitative analysis, GSID strongly believes that the ranking reflects actual situation on the ground and recommends to ECOSIB / AIC for study.

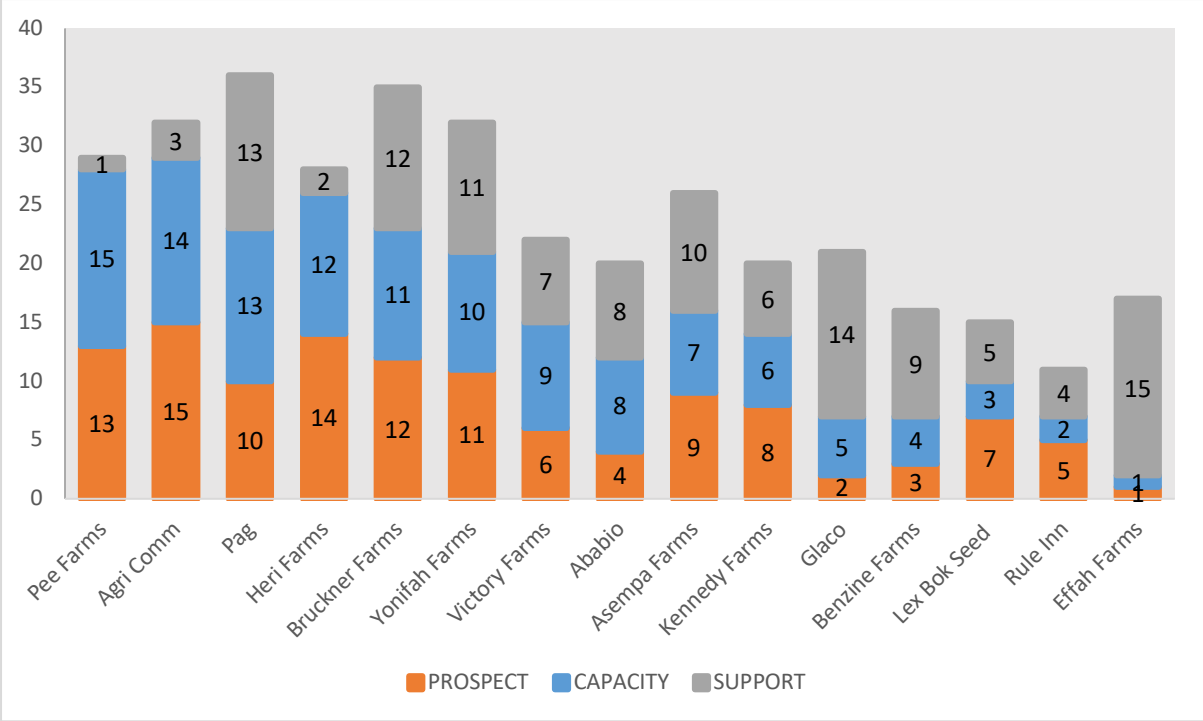


Figure 2: Ranking of Seed Companies (Prospect, Capacity & Support)

The studies conducted by GSIB under ECoSIB and using the ranking criteria above show that:

i. Pee Farms, Agri Commercial Farms, PAG Farms, Heritage Farms and Buckner Farms are the top 5 Companies having the capacity to produce quality certified seeds and prospects to evolve into large seed companies.

ii. Effah Farms, Rural Innovations, LexBok, Benzine and Glaco Farms have the least capacity to produce quality certified seeds.

iii. Effah Farms, Glaco Farms, Pag Farms, Buckner Farms and Y. Farms are the top 5 companies that require the highest level of support.

The ranking are presented in figure 3 below and provides the opportunity for ECoSIB to deliver targeted services to the SMEs.

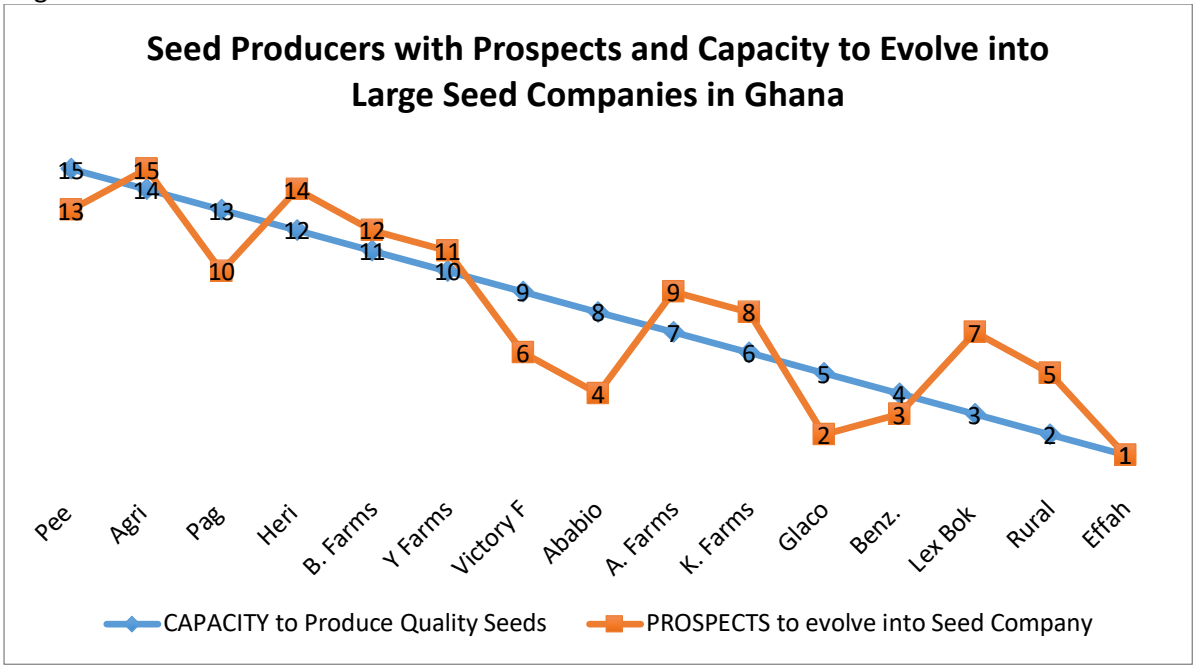


Figure 3: Capacity & Prospects to Evolve into Large Seed Companies

3.21.4 Gaps and Intervention area

The 15 seed companies were assessed to identify the current status, the areas for intervention and recommendations for redress

GAPS/FINDINGS	RECOMMENDATIONS
KENNEDY FARMS	
• Reluctance by growers to promptly register for seed production • No document available to validate nature of claim to land • Minimum isolation distance not met • No farm structures available on farm • No designated storage facility • No proper farm recording system to track farm operations	• Enterprise should register promptly prior to production and must ensure renewal of registration seasonally as prescribed by the Plants and Fertilizer Act 803. • Proper documentation indicating ownership and or nature of claim to the land should be acquired • Recommended isolation distance should be adhered to avoid cross contamination • Essential farm houses including office should be provided to ensure smooth running of farm business/operation • Structures/buildings earmarked for seed storage must be of standard • Good documentation system should be adopted. • Training on good record keeping and establishment of quality management system.
ABABIO FARM	
• No document available to validate nature of claim to land • Challenge in registration for seed production • No farm structure available on farm • Farm records were poor as there was no documentation regarding farm operations • The storage facility is inadequate • Quality management system not in place	• Proper documentation indicating ownership and or nature of claim to the land should be acquired. • Enterprise should register prior to production and must ensure renewal of registration seasonally as prescribed by the plants and fertilizer Act 2010, (Act 803) • Recommended isolation distance should be adhered to so as to assure the quality of the seed • Training on good record keeping for farmer and farm workers. • Structures/buildings earmarked for seed storage must be upgraded to ensure good ventilation and good sanitation practice.
YONIFAH SEED LIMITED	
• No labeling of fields • No Contractual agreement between farm owner and out growers • Record keeping is incomplete	• Fields should be labeled • All contracts must be documented • Farmer and farm workers must be trained in data management to aid in proper record keeping
PAG FARMS	
• Field not labeled • Staff not adequately trained in seed production and handling	• Field should be labeled indicating relevant information like crop, variety, time of planting etc. • Growers are to ensure they register before production. • Growers should be trained and sensitized on the relevance of the Plants and Fertilizer Act, 2010 (Act 803).
AGRI COMMERCIAL SERVICES	
• Sanitary conditions existing in storage rooms not encouraging • Field not labeled • Seed Enterprise does not possess processing equipment as this is a requirement for foundation seed producers	• Structures/buildings earmarked for seed storage must be of standard (well ventilated, pellets, pest free and good sanitation practice) • Field should be labeled indicating relevant information like crop, variety, time of planting etc. • Seed Enterprise could be supported to acquire seed processing equipment.
PEE FARMS	
• Records keeping and documentation of farm operations was not encouraging although there is established a farm office and an employer. Example, land documents, certificate of business registration, waybills, receipts and others supporting documents. Certification tags of foundation seeds were not easily retrievable or	• Enterprise employees need training on documentations and other administrative skills. • Farm manager and the other permanent workers must have formal training in seed production • There should be implemented a management system to ensure that seed production and processing at any point meets all the regulatory and quality requirements.

are disposed off and not kept. • No records were produced on the formal training in Certified Seed production for any of the workers for the farm. Some of workers have worked for quite number of years but it's just been informal training on seed production. • Registration for that production season was done two months after planting. • Rooms demarcated as storage room was not well aerated. • Fields had sign post but not labeled with the relevant information as prescribed by the Plants and Fertilizer Act, 803.	• Storage room could be fitted with air conditions or enlarged opening with ceiling fans to improve aeration optimum for seed storage. Seeds should be arranged well to enable optimum aeration to improve the shelf life. • It is a major requirement that fields must be appropriately labeled bearing all the relevant information of the farm and thus recommended
BRUCKNER FARMS	
• Bruckner Farm lacks seed processing equipment and seed storage facility. • There were no farm office where relevant documents are kept. (land documents, certificate of business registration, waybills, receipts and others supporting documents, certification tags of foundation) • Registration for that production season was done two months after planting. • No records were produced on the formal training in Certified Seed production for any of the workers for the farm. • There was no sign-post and field labelling.	• Farm should be supported with seed processing equipment and storage facility to improve the production and processing of quality seeds • It is recommended that there should be an office for documentation and record keeping and for day to day administrative running of the farm. • Farm manager and the other permanent workers must have formal training on seed production • It is a major requirement that fields must be appropriately labelled bearing all the relevant information of the farm • Bruckner farms should implement a management system to ensure that seed production and processing at any point has meets all the quality assurance standards.
ASEMPAH FARMS	
• Asempah Farms lacks seed processing equipment and seed storage facility • There were no farm office where relevant documents are kept. (land documents, certificate of business registration, waybills, receipts and others supporting documents, certification tags of foundation) • No records were produced on the formal training in Certified Seed production for any of the permanent workers for the farm irrespective of their educational background.	• Farm should be supported with seed processing equipment and storage facility to improve the production and processing. Asempah has already allocated a land for the seed processing and storage facility, hence could be supported financially • Farm should get an office for the Farm Manager to keep records and carry out administrative duties of the farms • Farm manager and the other permanent workers must have technical training on seed production and seed quality assurance. • It is a major requirement and fields must be appropriately labeled bearing all the relevant information of the farm
VICTORY FARMS	
• Victory Farms has no internal quality assurance checks as his documentation falls short of relevant forms and formats. • Workers have no formal training in seed production	• Training and/or sensitization on the Plant and Fertilizer Act, 2010 (*Act 803*) as well as the Quality Assurance Procedures for Ghana • Workers need formal training in seed production
EFFAH FARMS	
• Farm has no infrastructure of its own in place • Insufficient farm records to setup a quality management system • Farm has very minimal equipment	• Victory Farm should register with GSID and obtain Foundation seed from GLDB or Registered private seed producers. • Enterprise should go through record keeping training and awareness creation for growers in Seed Act and Seed Quality Assurance • Farm should secure infrastructure dedicated to his own seed stocks and obtain mobile processing unit for seed production as current facility is used by commercial rice grain producers
GLACO FARMS	
• Inadequate record keeping	• Enterprise should go through record keeping training • Awareness creation for growers on Seed Quality assurance for Ghana

BENZINE FARMS	
• Challenges with seed conditioning as public processing and storage facilities are not in good condition • There was no proper documentation of farm records • Grower does not know the requirements of the Plant and Fertilizer Act, Act 803 • Farm hands are not well train in seed production and handling	• Benzine Farms needs support to own a processing facility • Benzine Farms should be sensitized on National Seed Quality Assurance • Train farmer and farm hands on seed production and handling • Develop quality assurance system for Benzine Farms
LEXBOK SEED COMPANY	
• Processing and storage facilities are not in good condition • There was no proper documentation of enterprise records • Grower does not know the procedures outlined in the Seed Quality Assurance • Farm hands are not well train in seed matters	• Lexbok Seed Company should consider owning a mobile Seed Processor to ensure seed quality • The company should go through training in quality assurance and record keeping • Be part of a Sensitization or awareness creation on Legislative requirements for growers
RURAL INNOVATIONS SEED COMPANY	
• No basic processing equipment • Inadequate farm and processing records • Limited knowledge of ACT 803 • Farm workers no fully aware of the basics in seed production	• Train farm manager (s) in record keeping and quality management • Train farm workers in essentials of seed production and handling • Sensitize management on procedures in Seed Quality Assurance
HERITAGE SEED COMPANY	
• Grower does not have the full grips of the procedures of the National Seed Quality Assurance system • Farm hands have not attended a relevant seed production training	• Requires additional coaching support to develop and operate a quality management system • Train farm workers on the essentials of seed production and handling • Should attend awareness creation programmes on the National Seed Quality Assurance Systems

3.22 Capacity building in incubation management for Incubator Managers

3.22.1 Uganda

The African Agribusiness Incubators Network (AAIN), a partner of ECoSIB, organized an incubation management capacity building training for its incubators, including staff of ECoSIB. The capacity building training was organized from the 12th – 14th September 2016 at CURAD, inside the Makerere University at MUARIK Kabanyolo Gayaza, Uganda. The training was on strategic agribusiness incubator management and covered topics such as:

- Overview of Business Incubation
- How to Establish an Incubator Facility
- Business incubation financials and sustainability models
- Business incubator operational models and incubator management
- Mentoring and coaching –Skill matching incubator and incubates
- Business incubation marketing and stakeholder management
- Stakeholder management
- Managing the business incubators and Monitoring frameworks
- Business planning – How to make planning the simplest game for winners

The training attracted participants from various parts of Africa, notably, Kenya, Ghana, Zambia, Uganda and Nigeria. The participants were also drawn from various fields of expertise, comprising

policymakers, agribusiness SMEs, production managers, lecturers, researchers, incubator managers and incubator owners.

Combining classroom, experience sharing and group work, the training also employed field visits to drive home clearly the message of agribusiness incubation management. Participants visited the CURAD incubation facility, TexFad, Tursam International Ltd and the Uganda Industrial Research Institute (UIRI), where we had the opportunity to learn from some best practices and share experiences.

The training on strategic agribusiness incubator management was very useful to ECoSIB since it built the technical and managerial capacities of the incubator's staff and afforded us the opportunity to establish strong networks with incubation experts and peer incubator managers who we can always contact to share experiences on best practices. Also, some technologies were adopted from the training which ECoSIB is working on to commercialize.

3.22.2 Ghana

On the 3rd October 2016, AAIN organized an induction training on agribusiness incubation for ECoSIB incubator partners at the Accra International Conference Centre.

The objectives of the training were to expose the incubator partners to the broader ecosystem of agribusiness, distinguish different types of agribusiness, and differentiate between the main components of agribusiness incubation, understand and describe the difference and importance of business incubation and a business incubator

3.23 AAIN Conference and trade exhibition

Four incubatees of ECoSIB were sponsored to participant in the just ended trade exhibition organized by AAIN (African Agribusiness Incubation Network) during its 2016 Agribusiness Conference & Expo.

The incubatees had exposure to international and local audience who expressed interest in their products, services and business and this interactive platform also offered them the opportunity to establish strategic business networks.
Companies that participated in the trade exhibition and the crop varieties showcased

COMPANIES	CROP	VARIETIES
Yonifah	Cowpea and Maize	Videza, Songotra, Paditua, Obatanpa
TIVS	Maize	Obatanpa, Omankwah
Glaco	Maize	Obatanpa, Omankwa
Asempah Farms	Maize	Mamaba, Omankwa

All the companies made significant direct sales and also created marketing opportunities and enhanced their business expansion prospects.
This is in line with ECoSIB's pursuit to provide market facilitation and linkage to the seed SMEs through promotion and visibility

Central to ECoSIB's objective of developing the Ghana seed industry is its resolve to strengthen the capacity of the seed association (NASTAG). ECoSIB worked closely with the Seed Association in diverse ways to build the administrative and management capacities of the Association. ECoSIB facilitated the development of a functional website (www.nastag.com) for the association to aid in its interaction with its members and key stakeholders. Also, ECoSIB, through its key partnerships with other projects, facilitated the recruitment, training and placement of an intern at the Seed Association to assist in the administrative set-up and running of the association

3.25 STRATEGIC NETWORKING

ECoSIB initiated dialogue with Ghana Agricultural Insurance Programme to extend services to the seed companies. ECoSIB is supported the seed SMEs to enrol onto the insurance programme. Similarly, eight (8) seed companies under the ECoSIB project have been supported to access credit from Rural Development Fund (RDF) of DANIDA on concessionary basis to expand their business. Facility documentation is at various stages of processing.

4.0 KEY ACHIEVEMENTS

OBJECTIVES	ACTIVITY	OUTPUT	OUTCOME
***Objective 1**: To develop seed business entrepreneurs to engage in commercial production and distribution of target improved seeds*	**1.1** Recruited Incubatees (Seed SMEs and Seed Yam Enterprise Farmers)	35	**1.2** Seed SMEs drawn from across the country for mentorship and coaching for this project.	**1.3** Entrepreneurship for Commercial Seed Incubation Business system developed and functional.
	1.1.2 Provided Business Management training	15	1.1.2.2 Managers and Owners of seed SMEs were trained in Seed Business Management including understanding the national seed policy and national seed plan.	1.1.2.3 Knowledge of seed business environment enhanced**.** Public Private Partnership Enhanced.
	1.1.3 Develop promotional tools including flyers, brochures, website, and linking to social media networks	1,200 200 5 3 1 1 4	1.1.3.2 Fryers Brochures Pull-ups Backdrops ECoSIB website NASTAG website Publications of ECoSIB Launch	1.1.3.3 Seed business awareness created among industry players and public knowledge of the ECoSIB initiative enhanced
	1.1.4 build capacity of management, staff, partners and board members of incubator in incubation management	10	ECoSIB partners trained in Incubation management by AAIN	Incubation management skills improved
	1.1.5 Establish and Strengthen networks and partnerships	8 15	Seed SMEs linked to the Rural Development Fund (RDF) of DANIDA to obtain credit on concessionary basis. Seed SMEs supported to enroll onto the Ghana Agricultural	Strategic network and synergy created

			Insurance Program	
	1.1.6 Mentoring and Coaching of Incubatees and Interns	9	Technical and business mentors from partnering institutions shared knowledge, skills, experience and resources with 35 seed SMEs	Technical and business operations improved
	1.1.7 Engage consultant to develop training Curriculum modelled after SEMIs	1	Training manual developed by Mr. Emmanuel Adjei	Training material available for use
	1.1.8 Launching of ECoSIB	1		
***Objective 2**: To Increase availability of improved quality seeds of selected crops to Smallholder farmers*	2.1 Mentored Private Commercial Seed Companies to produce and supply EGS (Foundation Seeds)	3	2.2 Private Seed companies: Asempa, Agri-Commercial Services and Benzene trained to produce EGS	2.3 65kg of Mamaba parental lines availability for multiplication to certified seeds
	2.1.2 Train certified seed growers to increase production	35	Seed companies trained in yam minisett technology and hybrid seed production (Principles of hybrid Seed Production, Field Demonstrations & Economic Importance of Hybrid Seed Production)	Seed SMEs technically equipped to produce certified seeds
	Built yam storage structure	2	Storage structures available for use by the enterprise farmers	Shelf-life of yam extended to avoid post-harvest losses.

Objective 3: *To facilitate market linkage between certified seed producers and seed buyers*	3.1 Market survey conducted		3.2 Created market linkages between seed producers and agro-input dealers	3.3 Brokered market with input dealers and establish permanent supply arrangement
	3.1.2 Developed website for NASTAG		Created interactive platform between seed producers and seed buyers	Seller/product information available for consumers to make buying decisions

5.0 IMPLEMENTATION CHALLENGES

1. There are limited systematic baseline data available to measure performance indicators in order to determine which of the seed SMEs demonstrate high growth potential and also to identify areas of incubation service the particular seed SME requires. This unstructured record keeping does not allow for proper evaluation and assessment of seed SMEs for tailored incubation service that will have a maximum intervention impact. It also interferes with work planning and goal setting.

2. There is a huge information gap along the seed value chain caused by significant level of incoherence in the institutional arrangement which affects production and distribution of improved seeds, worst at the farmer level.

3. It has been noticed that the lack of extension services is one of the main reasons for the low adoption rate of improved varieties. Extension plays a crucial role in training farmers in on-field seed production and therefore it is a prerequisite for improvement in the informal seed system. Extension raises awareness among farmers regarding the merits of the improved seed being introduced and work towards improving the ability of farmers to control the quality of seed. ECoSIB fills this gap through its mentorship and handholding approach to providing technical and business services.

6.0 LESSONS LEARNT

The project implementation presented many key lessons, notable among them are that:

1. Farmers are willing to use improved seeds for all the economic benefits it presents but they have weak purchasing power making them go for sub-standard seeds which come with less cost. Controlled price regimes by the umbrella association has not been successful because of varied production cost. ECoSIB has built the business systems of the seed companies to produce at the minimum cost and sell to farmers at a price that will be affordable to smallholder farmers to enhance adoption.

2. Project success depends on quality and commitment of the entrepreneurs being incubated and their sense of commitment is linked to the unique business challenges the project addresses. Entrepreneurs' input on project design would increase their desire for mentorship, willingness to learn and be more prepared to take calculated risk. This would enhance the successful outcome of targeted intervention and ensure a positive impact on the business operations of project beneficiaries.

3. Significant amount of seed is sold through Agro dealers. However, most of the Agro dealers lack the capital to stock seeds especially when seed companies do not provide credit or consignment stock. They also lack knowledge of the characteristics of the seed they sell to be able to educate farmers who visit their shops. Therefore, providing credit and training to Agro dealers on varietal characteristics and good seed handling practices will boost seed sales and encourage more entrants into the seed retailing business therefore widening the seed market outlets farther to the rural communities to enhance availability and accessibility by the smallholder farmer.

4. Hybrid maize production is profitable due to its high yield potential, it requires appropriate level of input use, which is mostly expensive, for achieving higher yield and profit. For instance, due to high level of rainfall variability, commercialization of hybrid seed production technology requires investment in irrigation to fully benefit from its high yield potential. Farmers in potential environment who can afford such constraining factors as irrigation stand to gain the most from adapted and suitable hybrids.

7.0 CONCLUSION

The cross-institutional collaboration needed to align research findings to commercial interest is enhanced by the joint efforts of KNUST, CRI, GLDB and AIC which developed hybrid MAMABA parental lines for the seed SMEs to commercialize the technology. However, for such linkages to be more functional, there is the need to formalize instruments of engagements through MOUs and contracts.

The various capacity strengthening activities by ECoSIB and its embedded post-training mentoring and coaching programs, has whipped up interest in the seed SMEs in adopting hybrid technology to produce superior quality seeds and make it available and accessible to smallholder farmers through expanded agro-dealer distributorship.

8.0 PROPOSAL FOR NO COST EXTENSION

8.1 PURPOSE FOR NO COST EXTENSION

1) Seasonality of production and training in Hybrid Seed Production

Most of the seed companies produced their seeds during the minor season (Sept-Feb) and still harvesting their produce. ECoSIB will want to review the output of the companies, assess their skills needs in hybrid seed production and repeat training that was offered in 2016. It was observed in 2016 training that additional technical support would be required by the SMEs to make them competent in hybrid seed production

2) Institutionalize Quality assurance protocols of seed SMEs to make them Seed Certified Compliant

With the leadership of Ghana Seed Inspection Division, a thorough quality assurance audit has been conducted. The no-cost extension period will enable ECoSIB provide the needed training and handholding support to enable them comply with registration requirements to make them duly certified seed growers

3) Provide Business management and Market Facilitation Services

KNUST has developed the Seed Management Manual and Curriculum and is currently auditing the business management systems of the seed companies. The no-cost extension will enable ECoSIB train the SMEs using the manual and further handhold them to establish functional business systems. Additionally, ECoSIB will intensify its market facilitation activities to benefit more institutions

4) Foster Strategic Networking

Currently, ECoSIB has initiated dialogue with Ghana Agricultural Insurance Programme to extend services to the seed companies. Within the period, ECoSIB will strengthen the dialogue and support the SMEs to enrol onto the insurance programme. Similarly the seed companies will be supported to develop business plans that will help them qualify for credit from Rural Development Fund. ECoSIB will also partner with other AGRA funded projects and leverage of expertise, activities and resources.

5) Intensify and Consolidate Sustainability Initiatives

As part of the sustainability model, ECoSIB will want to visit areas of best practices where seed distribution is a profit-making venture of the private sector. Additionally, it will want to commercialize some of its services and engage government to also leverage on AGRA's support to expand services to more beneficiaries.

6) Document and share Best Practices

ECoSIB will document best practices and lesson learnt, share with MOFA, Seed Companies, other relevant institutions as well as similar project supported by AGRA