



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

## Impact of Numeracy and Farming as a Business Training on Farmers' Yields

A USAID's ADVANCE Project Report: JUNE 2018



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# USAID's ADVANCE PROJECT REPORT

COOPERATIVE AGREEMENT No. AID-641-A-14-00001

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# Executive Summary

## Introduction

Farming as a Business (FaaB) and Numeracy are among the four main training interventions rolled-out under the Agricultural Development and Value Chain Enhancement Project (ADVANCE) II to smallholder farmers in the Brong Ahafo, Ashanti, Northern, Upper East and Upper West regions. FaaB training is a practical curriculum developed by ACIDI/VOCA to train smallholder farmers to build their capacities and re-orient them on farming and marketing practices with the aim of transitioning from subsistence traditional approaches to business oriented models. The numeracy training, on the other hand, aims to build the capacity of smallholder farmers in the identification of numbers and performance of basic arithmetic, engendering the ability of the farmer to keep basic records of farm activities and expenses. Following the review of the monitoring data by the project implementers, it has come to light that FaaB and Numeracy trainings compared to the others have not reaped the expected benefits and hence the need to engage further with the relevant stakeholders (beneficiaries and implementing agencies) to validate the observation and, if confirmed, ascertain the underlying reasons.

## Objectives and Methodology

The study sought to assess the overall benefit of the FaaB and Numeracy trainings to the smallholder farmers between the 2014 and 2016 survey periods.

The specific objectives in relation to the FaaB training were to:

1. Determine whether the scale of production and yield of smallholder have increased after receiving the FaaB trainings;
2. Determine whether the gross margin of the smallholder farmers increased since receiving the training;
3. Ascertain whether the approach to farming and marketing has change since receiving training;
4. Find the specific business approach farmers are undertaking different from what they use to do resulting in significant business linkages;
5. Find out whether smallholder farmers are meeting buyer specifications and agreeing to contract terms;
6. Identify whether volume supplied by smallholder farmers increased since 2015; and
7. Find out the farmers making use of knowledge acquired; men or women farmers

The specific objectives in relation to the numeracy trainings were to:

1. Identify whether beneficiary farmers perform simplified identification of numbers, count basic numbers, read basic notes and identify various cedi denominations;
2. Find out whether farmers have started keeping basic records on their own with little to no support from other people;
3. Check whether farmers are able to accurately estimate cost incurred in their production for the just ended production season and estimate bags of volume realized from farms, bags of volume sold and money value from sales;
4. Assess whether farmers are tracking prices at various markets to fix prices at which they will be selling; and
5. Find out whether men or women farmers are making use of knowledge acquired

The study adopted the mixed methods design which allowed for combining both qualitative and quantitative approaches for collecting, analyzing and interpreting data. It involved the comparison of quantitative indicators for the smallholder farmers such as their value of sales, the volume of sales of farmers, and their yields over time. The main data set used for the analyses was the 2017 fieldwork data, and where appropriate the Gross Margin Survey was also used. The 2017 field data was used to ascertain descriptive distribution patterns using tables and graphs. The qualitative component of the study emanated from interviewing the outgrower businesses (OBs) and the farmer based organizations (FBOs) which are linked to the smallholder farmers. Key informants on the FaaB and Numeracy beneficiary comprising the trainers and the Capacity Development Team members were also interviewed. The study used the random sampling technique in selecting the smallholder farmers from each of the four-targeted areas for the study. In all, 172 smallholder farmers were randomly sampled for the analyses. In addition, information from the 16 OBs, four (4) trainers, three (3) Capacity Development Officers (CDOs), and 32 FBOs who are linked to the outgrowers were also garnered through in-depth interviews (IDIs) and focus group discussions (FGD). Descriptive statistics were used to analyze the quantitative data, while the thematic approach was used to analyze the qualitative data.

## **Main Findings**

The data were analyzed based on the 12 (7 for FaaB and 5 for Numeracy) specific objectives of the study. Summary of the findings are as follows:

The findings regarding the FaaB training are:

- Beneficiary maize farmers of FaaB training increased their farm sizes by 0.3 acres between the 2014 and 2016 farming seasons. Similarly, beneficiary rice farmers increased their farm sizes (area cultivated) by 0.3 acres between the same period. However, beneficiary soy farmers recorded a decrease in farm sizes by 0.8 acres between 2014 and 2016 farming seasons using the 2017 Field Data.
- The average size of maize farms for beneficiary FaaB farmers in the South (6.5 acres) is twice that of the Northern (2.0 acres), Upper West (2.3 acres) and Upper East (1.7 acres) using the 2017 Field Data.
- The yield per acre of the beneficiary smallholder farmers increased between the 2014 and 2016 farming seasons. After the FaaB training in 2015, smallholder maize, rice and soy farmers increased their yield by 1.2 MT, 1.8MT and 0.32MT, respectively.
- Beneficiary maize and soy smallholder farmers who received the FaaB training increased their profit margin by GH¢937.7 and GH¢ 158, whereas that of rice farmers recorded a decrease of Gh¢222.8 using the 2017 Field Data
- Volume of supply of beneficiary FaaB farmers of maize, rice and soy increased between the two farming seasons by 2.24 MT, 1.06MT and 0.27MT respectively.
- More than three (3) out of every four (4) maize farmer practiced row planting after the FaaB training.
- After the FaaB training, more than three quarters of the maize beneficiary FaaB farmers applied fertilizer compared to soy (53.49%) and rice farmers (46.30%).
- The rate of adoption of the usage of certified seeds for planting is barely average among the beneficiary smallholder farmers after the FaaB training, with 53.57, 48.84 and 37.04 percent of the maize, soy and rice farmers, respectively currently using certified seeds.

- Out of the beneficiary FaaB farmers, more than three (3) out of every four (4) maize farmers in the project South Region were meeting their market specification compared to 72, 50, and 30 percent of their counterparts in the Northern, Upper West and Upper East regions, respectively.
- Currently, 61 percent of the maize farmers are meeting market specifications compared to 55.81 and 51.85 percent for the soy and rice farmers, respectively. The limitation of the field data applies to this case as well.
- About three (3) out of four (4) beneficiary smallholder farmers of Numeracy training can do simple identification of numbers.
- After the Numeracy training, 85 percent of the smallholder farmers in the North can read basic notes compared to 26.1 and 24.0 percent in the Upper West and the Upper East region, respectively.
- In terms of record keeping, 100 percent of the Northern region's farmers were keeping records of their farming activities compared to 52.2 and 47.8 percent in the Upper East and Upper West regions, respectively.
- After the Numeracy training, 80 percent of the farmers (59 out of 73) have estimated their cost of production in the year 2016. This proportion increased to 84 percent in the year 2017 corresponding to 62 out of the 73 smallholder farmers.
- About 51 percent of the smallholder farmers (37 out of 73) were able to record their sales after the Numeracy training in the year 2016. However, in 2017, only 12 percent of the smallholder farmers (9 out of 73) were able to keep record on their sales.
- After the Numeracy training, 93.8 percent of the male farmers are making use of the knowledge acquired from the training compared to the female farmers of 89.5 percent.

## **Conclusions and Recommendations**

Over all, the study outcomes indicate that beneficiary smallholder farmers of the FaaB and Numeracy trainings have made some progress in some areas of their farming and marketing practices such as increasing their yield of production and volume of sales, implementing good agronomics and post-harvest handling practices, ability to identify simple numbers and various cedi notes. In terms of the yield of the smallholder farmers, though farmers registered increases across the two farming seasons, these were only marginal. The same applies to the size of farm and the volume of supply of the beneficiary farmers. However, other important indicators such meeting of buyer specifications, contract terms, and reading basic notes continue to fall short of the desired expectations.

Based on the main findings and the conclusion of the study, the following recommendations are made:

- Given that the effect of the trainings on the profit margin is low for rice and soy farmers, it is therefore recommended that the training should elaborate further on meeting market specifications and buyer requirements independently for each of the crops.
- Against the backdrop of a barely average adoption of certified seeds, the trainings should reiterate the need for the farmers to form Village Savings and Loans (VSL) groups in order to mobilize savings within themselves for timely purchase of certified seeds.
- The FaaB trainings should further emphasize the need for every smallholder farmer to belong to an FBO or an outgrower business scheme in order to attract bulk buyers.
- The FaaB and Numeracy trainings should bring out practical approaches of linking potential buyers to the beneficiaries. In case ADVANCE has other trainings for addressing the market and buyer linkages, an integrated approach can be adopted for the FaaB and Numeracy beneficiaries.

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## ACRONYM LIST

|            |   |
|------------|---|
| ADVANCE II | Agricultural Development and Value Chain Enhancement Project II |
| DRIC       | Directorate of Research, Innovation and Consultancy             |



|       |  |
|-------|--|
| FaaB  | Farming as a Business                              |
| FBOs  | Farmer Based Organizations                         |
| FGDs  | Focus Group Discussions                            |
| FtF   | Feed the Future                                    |
| IDIs  | In-Depth Interviews                                |
| KII   | Key Informant Interview                            |
| KM&L  | Knowledge Management and Learning                  |
| OBs   | Outgrower Businesses                               |
| OGs   | Outgrowers   |
| ToR   | Terms of Reference                                 |
| UCC   | University of Cape Coast                           |
| USAID | United States Agency for International Development |
| VSLAs | Village Saving and Loans Associations              |

## 1.0 Background

Farming as a Business (FaaB) and numeracy are among the many trainings rolled-out by the Agricultural Development and Value Chain Enhancement Project II (ADVANCE) officials to smallholder farmers in the Brong Ahafo, Ashanti, Northern, Upper East and Upper West regions of Ghana. FaaB training is a well-structured and evidence-based curriculum developed by ACDI/VOCA to train smallholder farmers to build their capacities and change their approach to farming from subsistence traditional approach to a business oriented one. With the FaaB curriculum, farmers are introduced to two main aspects of farming. The first aspect concentrates on farming approaches that enable farmers to improve their yield and expand operation capacities towards increasing their scale of production, gross margin, and volume supplied to the market. The farming approaches under this aspect consist of activities that span from preparing the land for farming to harvest.

The second aspect of the FaaB curriculum centralizes on exposing the smallholder farmers to marketing approaches that engender newer business practices, enormous and deeper business linkages, and meeting buyer specifications and contract agreements. Unlike farming, the marketing approaches prioritize bridging the ever-increasing end-marketing demands and buyer specific requirements. The numeracy training, on the other hand, was mainly organized to build the capacity of smallholder farmers in identification of numbers and making basic arithmetic. These include simple identification of numbers and basic arithmetic such as counting basic numbers, reading basic notes and differentiating between the various cedi denominations. Another significant component of the numeracy training is teaching the smallholder farmers to keep basic records on their farming and business activities exclusively or with minimal support from others. The numeracy training is expected to enable smallholder farmers to accurately estimate their cost of production, volume of produce realized from their farms, quantity of produce sold in the market and the monetary value from the sales of their produce in the market. Furthermore, the smallholder farmers are taught to make informed decisions by keeping a record of prices in alternative markets before fixing their own prices.

The rationale for FaaB is to train the smallholder farmers to build their capacities and to view farming from a business perspective. Most importantly, FaaB has a motive of orienting the farmers to have a mindset based on profit maximization. This is against the backdrop that most farmers perceive farming as an everyday activity, traditional and mundane. Additionally, a farmer obviates taking critical decisions that affect his farming unlike the businessman. In addition, there was the realization that there was a huge gap between farming and successful selling of produce to the end-users. Thus, FaaB emphasizes that the farmer has to give foremost consideration to the potential market before engaging in any type of farming. This is because there is no incentive to produce at a large scale without the corresponding market demand. Hence, FaaB stresses farmers' awareness of potential buyers, market requirements and specifications, and how to create deeper linkages with such buyers and the markets. The quest to fill these gaps for the smallholder farmers gave rise to the FaaB training.

In the context of numeracy training, the farmers were exposed to this training in order to boost their capacity in making basic mathematical calculations, simple identification of numbers and various denomination of the local currency. Most of these farmers are illiterates; there is the tendency of them being cheated in the market and hence the FaaB is introduced to furnish the farmers with basic numeracy in their market dealings.

Since 2015, over 30,000 smallholder farmers have benefited from both Numeracy and FaaB trainings from the Project [see ADVANCE Terms of Reference (ToR) for FaaB and Numeracy Trainings]. This study is aimed at understanding the improvement made by smallholder farmers so far in increasing yields and the ability to transact business with markets effectively to earn higher incomes and on consistent basis.

## 2.0 Purpose and Expected Use of the Survey

The purpose of this survey was to validate and ascertain reasons why the FaaB and Numeracy trainings did not yield the expected returns compared to the other trainings. The findings from this study will help identify strategies to dispense these training interventions

## 3.0 Objectives of the Survey

The study sought to assess the overall benefit of the FaaB and numeracy trainings to the smallholder farmers between the 2014 and 2016 survey periods.

The specific objectives in relation to the FaaB training were to:

1. Determine whether the scale of production and yield of smallholder have increased after receiving the FaaB trainings;
2. Determine whether the gross margin of the smallholder farmers increased since receiving the training;
3. Ascertain whether the approach to farming and marketing has change since receiving training;
4. Find the specific business approach farmers are undertaking different from what they use to do resulting in significant business linkages;
5. Find out whether smallholder farmers are meeting buyer specifications and agreeing to contract terms;
6. Identify whether volume supplied by smallholder farmers increased since 2015; and
7. Find out the farmers making use of knowledge acquired; men or women farmers.

The specific objectives under the numeracy trainings are below:

8. Identify whether beneficiary farmers perform simplified identification of numbers, count basic numbers, read basic notes and identify various cedi denominations;
9. Find out whether farmers have started keeping basic records on their own with little to no support from other people;
10. Check whether farmers are able to accurately estimate cost incurred in their production for the just ended production season and estimate bags of volume realized from farms, bags of volume sold and money value from sales;
11. Assess whether farmers are tracking prices at various markets to fix prices at which they will be selling; and
12. Find out whether men or women farmers are making use of knowledge acquired.

## 4.0 Survey Methodology and Data Collection Techniques

This chapter describes the methods and procedures that were adopted during the data collection and data analysis periods.

#### **4.1 Research Design**

The research design adopted for this study was mixed methods which allowed for combining both qualitative and quantitative approaches for collecting, analyzing and interpreting data. It involved the comparison of quantitative indicators for the smallholder farmers such as their gross margins, the volume of sales of farmers, and their yields over time. The qualitative aspect of the study emanated from interviewing the outgrower businesses (OBs) and the farmer based organizations (FBOs) which are linked to the smallholder farmers. Key informants on the FaaB and Numeracy trainings comprising the trainers and the Capacity Development Team members were also interviewed.

#### **4.2 Sample Size and Sampling Procedures**

The study is a project wide one under the Knowledge Management and Learning (KM&L) Studies. Consequently, the project considers all the four regions of ADVANCE concentration, namely the ADVANCE South (Ashanti and Brong Ahafo regions), Northern, Upper East and Upper West regions. The target respondents for the study were outgrowers who are beneficiaries of the FaaB and Numeracy trainings. In addition, information from the OBs, trainers, the Capacity Development Officers (CDOs), and the FBOs who are linked with the Outgrowers were also garnered through Key Informant Interviews (KIIs) and Focus Group Discussion (FGD). This is consonant with the original demands of the study, which stipulates the interview of 200 outgrowers from the four regions. Thus, 50 respondents per region (25 for FaaB and 25 farmers for numeracy) were to be sampled at random from the 2015 Gross Margin Project database. Additionally, the Regional Capacity Development teams, OBs of sampled smallholder farmers and some trainers used in the regions to run the Training of Trainers (ToT) comprising the KII staff were to be interviewed on the effectiveness and impact of FaaB and Numeracy trainings on smallholder farmers approach to farming and marketing.

The study deployed the random sampling technique in selecting the smallholder farmers from each of the four-targeted areas for the study. First, communities in the regions where training was organized were randomly selected. Second, the study randomly sampled the smallholder farmers that are to be interviewed from the sampled communities as in the 2015 Gross Margin Survey.

#### **4.3 Survey Instruments**

To ensure sufficient information to meet the objectives of the study, six (6) sets of instruments were developed. Two of the instruments were structured questionnaire for the smallholder farmers who are the beneficiaries of the FaaB and Numeracy trainings. The remaining four comprised three In Depth Interviews (IDIs) and one FGD for the OBs, the trainers of FaaB and Numeracy, the Capacity Development Officers and the FBOs, respectively. It is worth stating that the design of the data collection instruments was guided by the objectives and the purpose of the project. Moreover, the instruments were structured to cover data/issues on all the indicators and other questions outlined in the project's ToR. The data collection instruments were also shared with the Client (ACDI/VOCA) and solicited inputs by way of comments and suggestions. The feedback from the Client was used to revise the tools for the Client's approval before the instruments were used for data collection.

#### 4.4 Recruitment and Training

Four research assistants were recruited to assist in primary data collection. Their recruitment was based on expertise, academic qualifications (minimum of Bachelor degree), familiarity with the local languages and the project sites and very good experience with projects of this nature and the FtF intervention.

Prior to the fieldwork, a one-day training program, which was monitored by an official of the Client (Tamale Office), was organized for the research assistants to enable them internalize the study's theory of change, objectives of the assessment, the contents of the various research instruments, ethical considerations involved this study, community entry strategies, anticipated challenges and how to resolve them. The training approach was very participatory and involved role-plays, translations and discussions on the rationale or the philosophy underlying some questions in the research instruments.

#### 4.5 Data Collection

For the FaaB and Numeracy Project, the mainstream data collection commenced on Thursday, 2<sup>nd</sup> November 2017 and ended on Thursday, 9<sup>th</sup> November 2017 for all the four areas of concentration of the study. Mop-up on the data collection was carried out in the Upper East, Upper West and the Northern regions. Table 1 indicates the respondents, the target data collection, and the response rate. The target respondents were the outgrowers (OGs), outgrower businesses (OBs), trainers, Regional Capacity Development Team (RCDT).

**Table 1: Data collection summary on FaaB respondents**

| Category of Respondents | Ashanti | Northern | Upper West | Upper East | Total | Target | Response Rate (%) |
|-------------------------|---------|----------|------------|------------|-------|--------|-------------------|
| FaaB OGs                | 25      | 25       | 25         | 24         | 99    | 100    | 99                |
| Numeracy OGs            | N/A     | 25       | 24         | 25         | 74    | 75     | 99                |
| OBs                     | 4       | 4        | 4          | 4          | 16    | 16     | 100               |
| Trainers                | 1       | 1        | 1          | 1          | 4     | 4      | 100               |
| RCDT                    | 1       | 0        | 1          | 1          | 3     | 4      | 99                |
| FBOs                    | 8       | 8        | 8          | 8          | 32    | 32     | 100               |

#### 4.6 Data Analysis

The completed instruments from the fieldwork were made computer readable by entering the responses into Statistical Product and Service Solutions (SPSS), and the transcriptions were done using the Microsoft Word. Subsequent data management and processing involved importation of data from SPSS database to STATA, and data cleaning, analysis and storage. Analytical tools/approaches such as descriptive statistics (frequency distribution and cross tabulation) and thematic analysis were employed to analyze the primary data. The main data used for the quantitative analysis is the 2017 field data and where appropriate, the Gross Margin Survey was used. The 2017 field data contained information on the beneficiary farmers of the FaaB and Numeracy farmers. However, the fieldwork data was limited to the current farming and marketing practices of the smallholder farmers. In addition, the sample of 99 FaaB beneficiaries and the 74 numeracy beneficiaries are not sufficient enough to establish meaningful causality and effects quantitatively.

#### 4.7 Ethical Issues

In recognition of the role or ethics in research, high premium was put on ethical standards at all the stages of the study, but particularly at the data collection stage. To this end, all respondents were assured of

confidentiality of the data and information they would provide for this study. All personal identifiers have, therefore, been removed from the report. Respondents were informed that the data would be used purposely and strictly for KM&L to improve the mode and method of implementation of the ACIDI/VOCA intervention and would not be disclosed to any other person or group of persons except the data collectors and the consultants. In order to satisfy ethical appropriateness requirements, each respondent's consent was sought before the interview or discussion commenced (see cover page of each instrument for a copy of the informed consent form used for this study). The consultant also signed non-disclosure forms with the Client to protect all information contained in hard and soft copies made available by the client to the consultant.

## 5.0 Main Findings

This section presents the main findings of the FaaB and Numeracy trainings. It presents the background of the respondents and findings on the benefits of the FaaB and Numeracy trainings.

### 5.1 Distribution of Respondents by Sex and Region

Figure 1 indicates the distribution of FaaB and Numeracy beneficiary smallholder farmers in the four regions of concentration by sex. Whereas the FaaB training was carried out in all the mentioned regions, that of the Numeracy was not introduced to the farmers in the South as at 2015. Considering the FaaB beneficiaries, the distribution showed that a greater proportion of the farmers are females with the entire Upper West region beneficiaries falling in female category. The remaining three regions (South, Northern and Upper East) had only four (4) percent proportion of male farmers corresponding to only one male farmer in their respective regions. Out of the 25 Numeracy beneficiaries in the Northern region, 52 percent were female farmers and 48 percent were male farmers. Similar to the FaaB beneficiaries, all the sampled farmers from the Upper West region were female. Finally, out of the 25 beneficiaries sampled from the Upper East region, 16 percent of them were male farmers compared to 84 percent of their female counterparts. Overall, a greater proportion of the beneficiaries for FaaB and numeracy were female smallholder farmers.

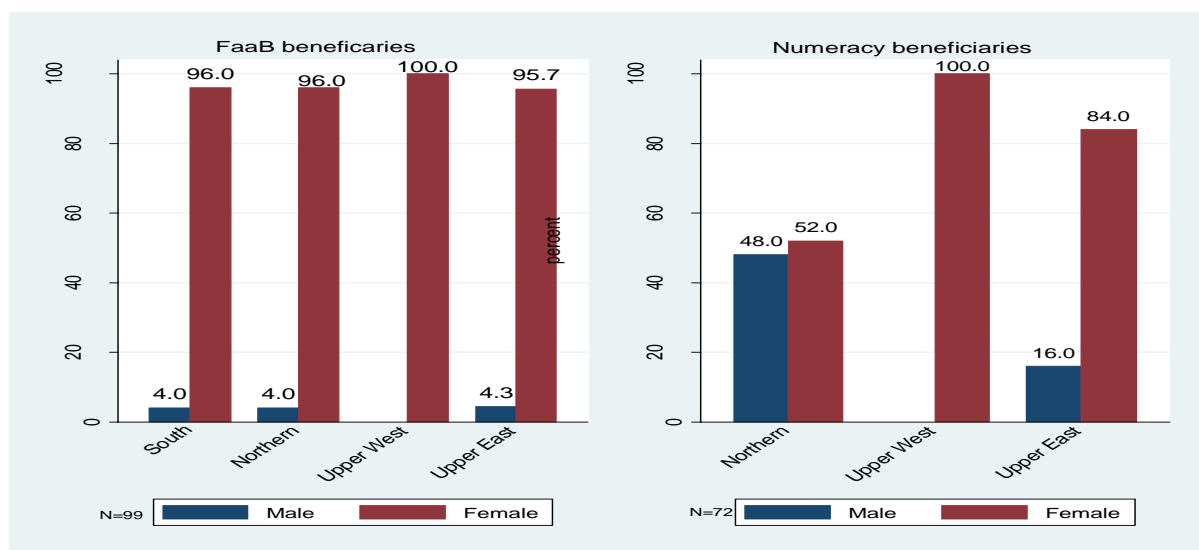


Figure 1: Distribution of respondents by region and sex

Source: Fieldwork Data, 2017

## **5.2 The Scale of Production and Yield of Smallholder Farmers after Receiving FaaB Trainings**

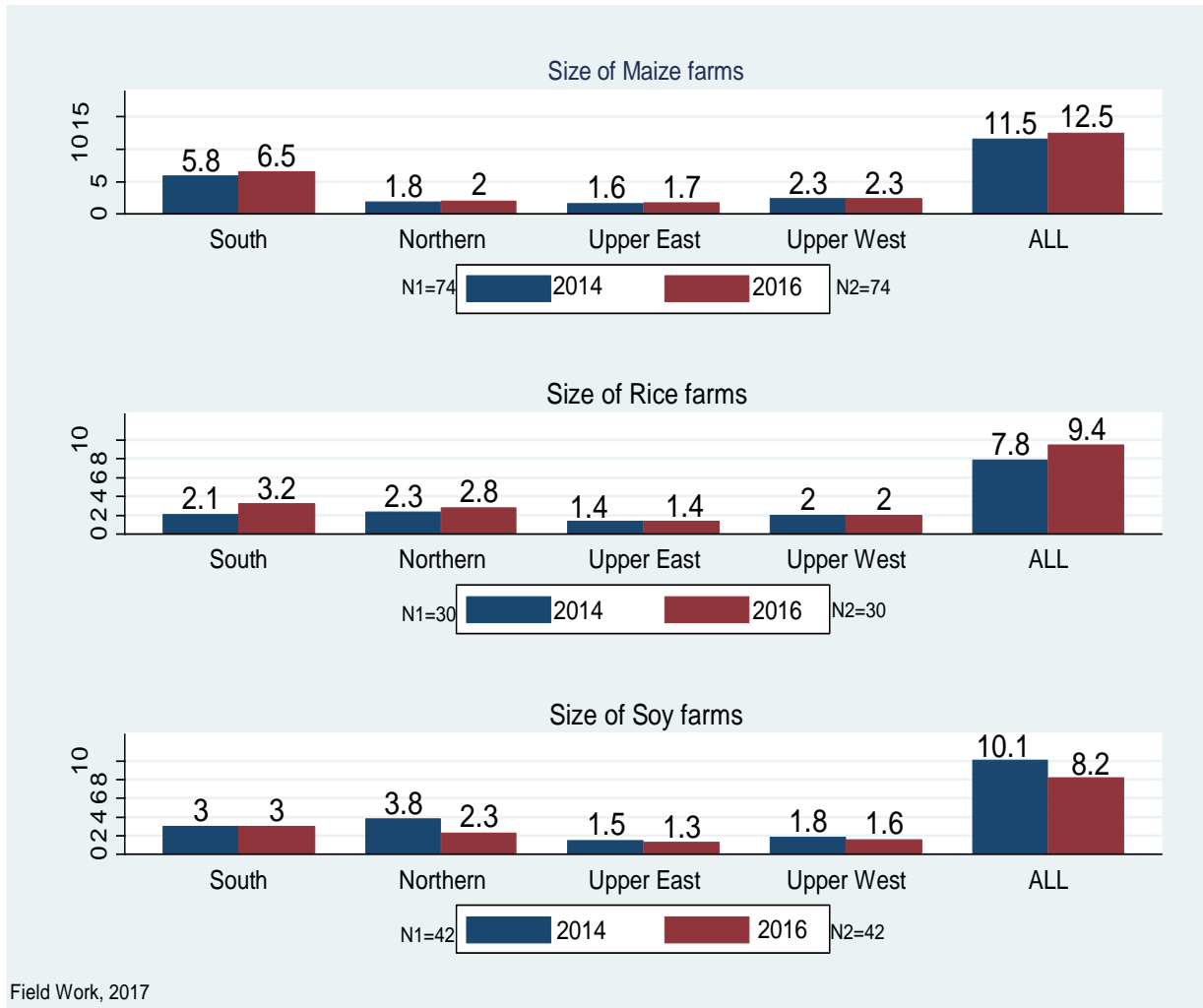
This section shows the distribution of scale of production measured as the estimated planted area of the smallholder farmer, considered in this analysis as farm size. Two sets of data are used to depict the distribution: the fieldwork data and the gross margin surveys in 2015 and 2016.

### ***5.2.1 The size of maize, soy and rice farms in 2014 and 2016***

Figure 2 shows the size of farms among the four regions for each of the three crops in 2014 and 2016. Concerning the maize farmers, the average size of maize farms increased by 0.3 from 3.2 acres in 2014 to 3.5 in 2016. Regionally, it can be realized that maize production in the southern sector recorded a very high average of about 5.8 mean of acres in the year 2014. However, the size of maize farmers increased to 6.5 acres on the average in 2016, representing about 12 percent increase in the year 2014. All the other regions recorded an increase over the two years except the Upper West region which maintained the same size of farm of 2.3 acres between the years.

Soy farm sizes are also depicted in Figure 2, in the year 2014 and 2016. Generally, soy farm recorded a decrease in the scale of production by 0.8 as the average size of soy farms before the FaaB trainings decreased from 2.8 to 2.0 acres in 2016. Accordingly, all the other regions recorded a decrease in the scale of production after the FaaB training with only the South maintaining the same acreage of 3.0 between the years 2014 and 2016.

Concerning the size of rice farms, the average scale of production of maize was 1.8 in 2014, however after the FaaB training the scale of production of rice increased by 0.3 acres to 2.1 in 2016. All the regions recorded an increase in the size of rice farms after the FaaB training except that of the Upper East and Upper West regions which maintained their scales before the training. Figure 2 shows the pattern of increase across the two periods in each of the regions.



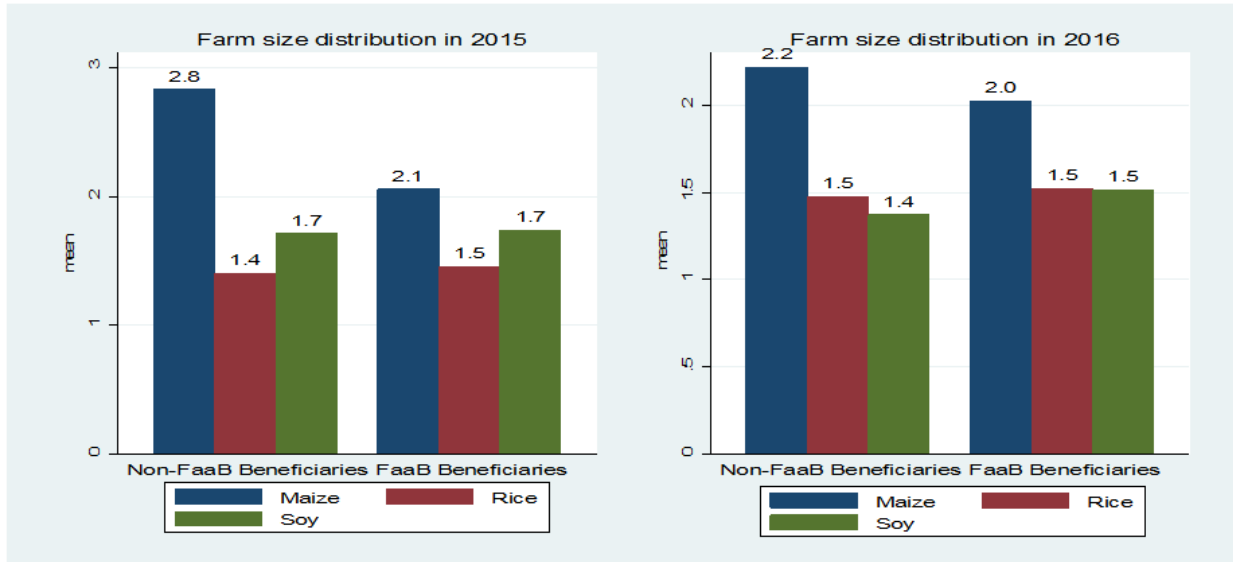
**Figure 2: Size of farms across crop type and over time**

Source: Fieldwork Data, 2017

**5.2.2 Farm size distribution across type of Crop for FaaB and Non-FaaB Beneficiary farmers**

The trend is shown below in Figure 3. From the figure, maize farmers have the highest yield for both FaaB and Non-FaaB beneficiary farmers. The general trend is that FaaB beneficiaries have a lower farm size across the three crops compared to the Non-FaaB farmers. The remaining trend is well depicted in the figure.





**Figure 3: Farm size distribution across FaaB and Non-FaaB beneficiary.**

Source: 2015 and 2016 Gross Margin Surveys

#### **5.2.4 The yield of smallholder farmers in 2014 and 2016**

The yield is considered as the farm output of smallholder farmers measured in Metric Tonnes per hectre (MT/ha). The description emanates from the field data for the FaaB beneficiary farmers in the 2014 and the 2018 survey periods. The yield for the three types of crops, namely maize, soy and rice are depicted in Figure 4.

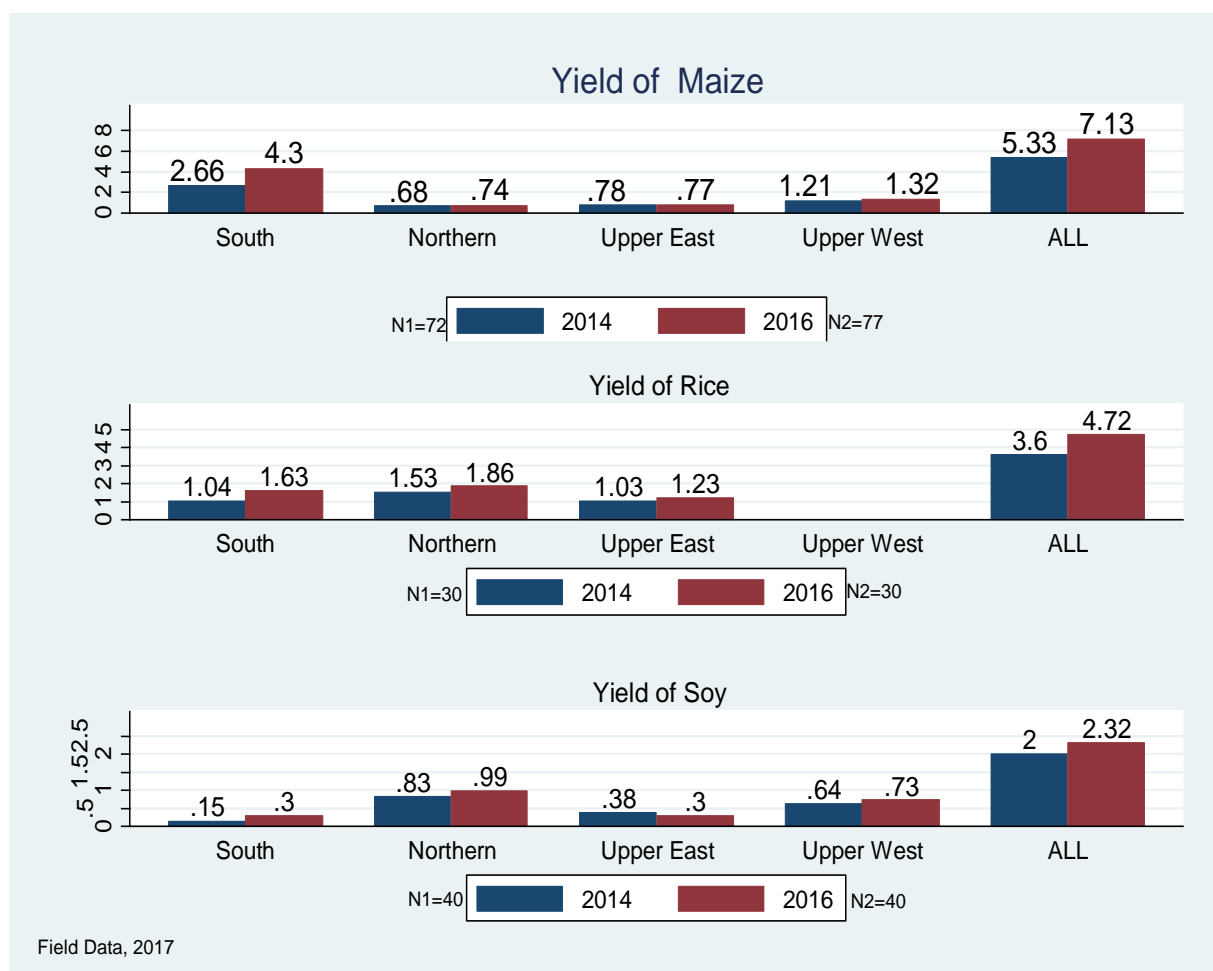
##### *The yield of the smallholder farmers in the three main crops*

In terms of the yield of maize for the 2014 and 2016 farming seasons for the beneficiary Faab farmers. The average yield in the 2014 farming season was 5.33 MT/ha, however this increased by 1.8 MT/ha to 7.13 MT/ha in the 2016 farming season. The South recorded the highest yield in maize production across the two farming seasons of 2.66 and 4.3 MT/ha respectively between the 2014 and 2016 farming seasons respectively. This is followed by the Upper West Region with 1.21 and 1.3 MT/ha respectively between the two farming seasons. However, the lowest yield was recorded in the Northern region where the beneficiary farmers recorded yield of 0.68 and 0,74 MT/ha between the 2014 and 2016 farming seasons.

In the case of the rice production, the yield also increased between the 2014 and the 2016 farming seasons by 1.12 MT/ha from 3.6 and 4.72 MT/ha, respectively. This increase compared to that of the maize yield is lower. Beneficiary farmers in the Northern region recorded the highest yield of 1.53 and 1.86 across the two farming seasons respectively. The South and the Upper West recorded the same yield for the two farming seasons. From Figure 4, Beneficiary FaaB farmers in the Upper West region are not into rice cultivation.

On the whole, the southern sector experienced the highest number of yield as compared to the other regions in maize cultivation. Specifically, the number of maize bags produced in the year 2014 in the Southern sector recorded about 26.6 cocoa sacks on the average. However, the yield in maize production increased to about 43 cocoa sacks on the average in the year 2016. This represents about 61.7 percent increase in the yield of maize production.

Beneficiary FaaB farmers across the four regions recorded a marginal increase of soy yield of 0.2MT/ha between the 2014 and 2016 survey periods. Amongst the four regions, the North recorded the highest yield of 0.83 and 0.99 MT/ha across the 2014 and 2016 survey periods. The region with the lowest production of soy yield was the South registering 0.15 MT/ha in 2014, and this increased to 0.3MT/ha in the 2016 Survey period. The rest of the distribution of crop yield across the farming seasons and the crops are depicted in Figure 4 below.



**Figure 4: Average yield of FaaB beneficiaries across crop type**

### 5.3 Gross Margin of the Smallholder Farmers since Receiving the Training

This section explores the Gross Margin for the smallholder farmers using the 2017 field data. In this section, the gross margin of farmers is operationalized as profit. The distributions across the three types of crops are presented below.

### ***5.3.1 The gross margin of smallholder farmers in the three main crops***

From Figure 5, average profit of maize farmers increased from GH¢2,245 in 2014 to GH¢3,218.7 in 2016. It can be observed that before the training, maize farmers in the southern sector recorded a profit of about GH¢1,048.80 for the year 2014. It then increased to GH¢2,065.80 on the average in 2016. Whereas the increases in the other regions are very marginal, profits reduced in the Upper East region.

Soy beneficiary farmers recorded average profit of GH¢1, 557.5 and GH¢1,716.1 between the 2014 and 2016 farming seasons, respectively. For the individual regions, soy farmers in the Northern region recorded the highest profit of GH¢998.5 and GH¢1003.8 for all the farming seasons respectively. This is followed by the beneficiary soy farmers in the Upper West region, with the least profit recorded by farmers in the Upper East region. However, farmers in the South recorded no profit from soy.

Rice farmers Rice farmers in the Northern Region experienced a marginal increase in their profit margin between 2014 to 2016 of about GH¢5.0 only. For 2014, the profit margin was about GH¢411.10, however this increased to experienced a marginal profit from 2014 to 2016. Specifically, in 2014, the profit margin recorded about GH¢490. It then increased marginally to GH¢501.10 in 2016 representing about 2.26 percent increase in the profit margins among the smallholder farmers. The region's profit in 2014 was lesser than the year's total average profit by GH¢31.00, while that of the 2016's profit was also below the total average profit by GH¢40.10.

Unlike Soy and maize, the average profit from rice decreased between the 2014 and the 2016 farming seasons of about GH¢200. This decrease can be seen among the beneficiary rice farmers in the South of about more than GH¢400 over the two farming seasons. However, beneficiary rice farmer in the Northern and the Upper East region recorded an increase in their profit margins, albeit marginal.

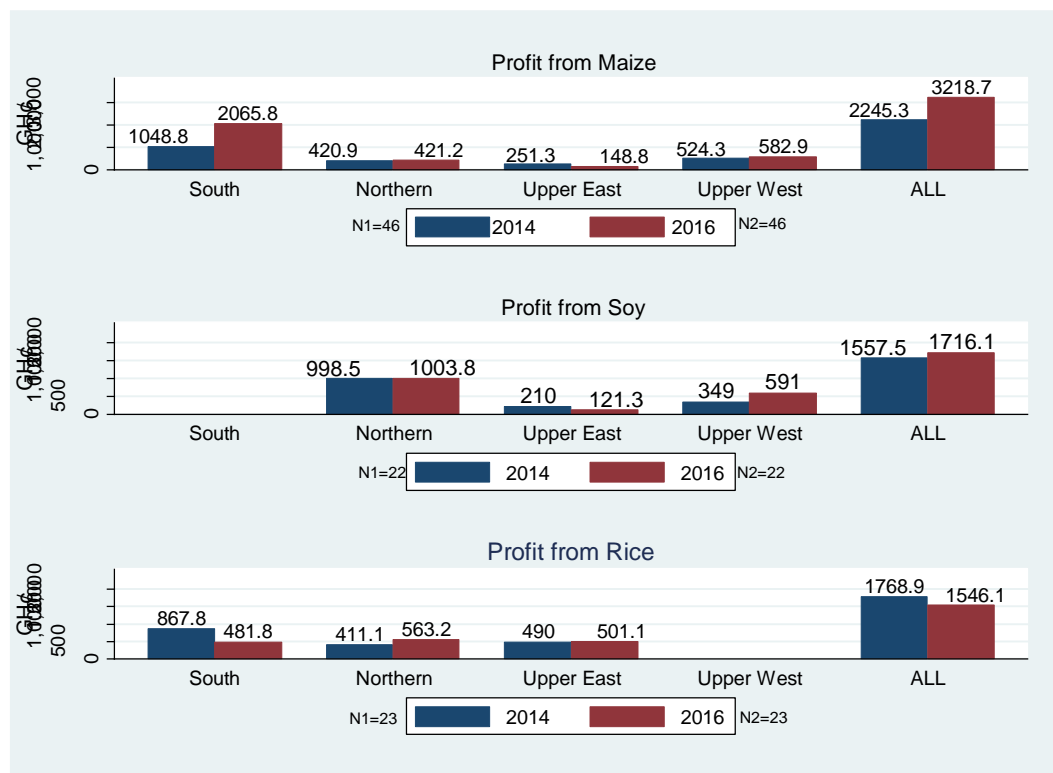


Figure 5: Gross margin of smallholder farmers in the three main crops

Source: Fieldwork Data, 2017

#### 5.4 The Approaches to Farming and Marketing of the Smallholder Farmers Since Receiving the FaaB Training

The main thrust for the FaaB training is to re-orient the farmers to adopt farming practices that increase their yield of production, and marketing practices that engender significant business linkages with potential buyers and markets. The farming and marketing practices currently adopted by the smallholder farmers are presented in the Table 2.

From Table 2, with the 84 of farmers were engaged in maize farming the across the four regions, about four out of every five of the farmers are practices row planting. In the case of 43 farmers engaged in soy production, out of the 43 farmers, 72.1 percent of them are engaged in row planting. However, in the case of the 54 rice farmers less than half of them representing 47.17 percent are adopting row planting. This implies that maize farmers on the whole are adopting row planting compared to the soy and rice farmers by 16.01 and 40.93 percentage points, respectively. A corroborating factor for the high adoption rate of row planting among the maize farmers stems from practice where most of the ADVANCE demonstration farms are on maize farming as adjudged by the farmers. In terms of the adoption of certified seeds for planting, the rate of adoption is barely average as only 53.6 percent of maize farmers are currently adopting this approach compared to yet a lesser proportion of 43.84 and 37.04 percent of soy and rice farmers respectively. Not surprisingly, as regarding modification for the training, some of the farmers requested financial assistance for the purchasing of the certified seeds.

In the same vein, Kojo Maatu, an OB in the Kintampo South, also lamented the inability of the smallholder farmers in maize farming to buy the certified seeds. He stated, “The certified seeds produce more yield than the normal seed. However, their problem too is that the seed is so costly”. Mr Opoku Agyeman, an OB in the Nkoranza South, distribute in an interview also complained about the costly situation of the certified seed. Concerning proving of seed through germination tests, only about one (1) out every four (5) farmer are adopting this farming practice. This has implications on crop yields when refilling of planting is not appreciable. In terms of fertilizer application, the incidence of adoption is relatively high among maize farmers compared to that of the other crops. Though most of the farmers that apply the fertilizer, apply the fertilizer at the right time and the right quantity, most of them are challenged by the high cost of the fertilizers. Hence, they sometimes have to compromise on the right quantity of fertilizer application which hinders their yield. Other farming practices as shown in the Table 2 are timing of planting, and planting the right quantity of seeds and refilling of planting. Overall, the farmers are averagely adopting good agronomic practices. Indeed, during the FGD, Fusieni Suleman, the Chairman of Tiehi – Sung Farmers Co-operative asserted that due to the FaaB training.

Concerning the marketing strategies from Table 2, farmers are currently adopting practices such as provision of temporary storage for their products to prevent loss of quality in their produce, bagging of their produce for effective meeting of market specification, treatment of produce, provision of warehouse, ability of meeting quantity demanded by buyers and market specifications, and provision for transportation. All the groups of FBOs in the Upper West for the FGD agreed that farmers are adopting marketing practices to improve quality. During FGD with the FBOs in the South, John Boansi, the Secretary of the Nyame-Bekyere FBO, made the following claim on the FaaB concerning marketing of their produce.

*Please they also taught us that if you harvest the maize before it dries up and you store it in a hut, it doesn't help. It will make the maize black or rot. But you can harvest some of the maize fresh; we have 3 ways of harvesting the maize, harvesting it while fresh, waiting for it to dry small and waiting for it to dry very well then how to temporary store in a hut ...*

Ekua Bonsu, deputy treasurer of the mentioned group, also made this assertion concerning the FaaB training “What I also heard during the training was that, now we have a special sack that you can use to bag your maize for a very long time without the maize getting spoiled”.

**Table 2 Current farming and marketing approaches of beneficiary FaaB smallholders**

| Farming and Marketing Approaches                 | Maize |       |       | Soy   |       |       | Rice  |       |       |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|  | Yes   | No    | Total | Yes   | No    | Total | Yes   | No    | Total |
| Row Planting                                     | 88.10 | 11.9  | 100   | 72.09 | 27.91 | 100   | 47.17 | 52.83 | 100   |
| Use of certified seeds                           | 53.57 | 46.43 | 100   | 48.84 | 51.16 | 100   | 37.04 | 62.96 | 100   |
| Seeds proven through germination test            | 30.95 | 69.05 | 100   | 25.58 | 74.42 | 100   | 31.48 | 68.52 | 100   |
| Refilling of planting                            | 67.86 | 32.14 | 100   | 53.49 | 46.51 | 100   | 40.74 | 59.26 | 100   |
| Planting the right quantity of seeds             | 86.90 | 13.10 | 100   | 62.71 | 37.29 | 100   | 55.56 | 44.44 | 100   |
| Timing of planting                               | 84.52 | 15.48 | 100   | 39.43 | 60.57 | 100   | 61.11 | 38.89 | 100   |
| Fertilizer application method                    | 77.38 | 22.62 | 100   | 53.49 | 46.51 | 100   | 46.3  | 53.70 | 100   |
| Timing of fertilizer application                 | 78.57 | 21.43 | 100   | 51.16 | 48.84 | 100   | 51.72 | 48.28 | 100   |
| Application of right quantity of fertilizer      | 75.58 | 24.42 | 100   | 55.81 | 44.19 | 100   | 30.30 | 69.70 | 100   |
| Application of knowledge with no/less assistance | 76.19 | 23.81 | 100   | 67.44 | 32.56 | 100   | 53.70 | 46.30 | 100   |

|   |       |       |     |       |       |     |       |       |     |
|---|-------|-------|-----|-------|-------|-----|-------|-------|-----|
| Provision of temporary storage              | 65.48 | 34.52 | 100 | 60.47 | 39.53 | 100 | 46.30 | 53.70 | 100 |
| Bagging of Produce                          | 80.95 | 19.05 | 100 | 69.77 | 30.23 | 100 | 64.81 | 35.19 | 100 |
| Treatment of Produce                        | 75.00 | 25.00 | 100 | 20.93 | 79.07 | 100 | 55.56 | 44.44 | 100 |
| Provision for warehouse                     | 52.38 | 47.62 | 100 | 44.19 | 55.81 | 100 | 33.33 | 66.67 | 100 |
| Ability to meet quantity demanded by buyers | 53.95 | 46.05 | 100 | 58.14 | 41.86 | 100 | 33.33 | 66.67 | 100 |
| Provision for transportation                | 59.52 | 40.48 | 100 | 53.49 | 46.51 | 100 | 37.04 | 62.96 | 100 |
| Ability to meet market specification        | 61.00 | 39.00 | 100 | 55.81 | 44.19 | 100 | 51.85 | 48.15 | 100 |
|   | N1=84 |       |     | N2=43 |       |     | N3=54 |       |     |

Source: Fieldwork Data, 2017

## 5.5 Specific business approach different from what smallholder farmers use to do resulting in significant business linkages

For the specific business approach, a member of the Capacity Development Team in the Kintampo South District, Mr. Abdul Salem, during an interview alluded to the development that farmers are actually tracking prices mainly by using the Issoko platform. With this platform, the receive text messages about prices of produce across Ghana. Hence, they are not unaware about prevailing market prices when linked to potential buyer. In addition, he stated that sometimes their outfit led the farmers to community buyers and district level buyers. A trainer in Northern region proffered further details on the specific business approach of the smallholder by stating that:

*Advance usually update us the trainers with prices of items on the market and we in turn pass it to trainees through their phones to enable them know how various items are sold on the market, and these farmers are linked with Savanna Marketing Company and buffer stock to supply farm produce after harvest.*

## 5.6 Smallholder Farmers that are Meeting Buyer Specifications and Agreeing to Contract Terms

### 5.6.1 Meeting of market specification

Figure 6 is a combined graph that shows the market specification for each crop among the four regions. A number of 84 maize farmers who had comparable information on market specification was used for comparison. For maize farmers in the Southern sector, about 84 percent of the farmers who were contacted met their market specification in terms of the quantity and quality of supply to the markets while about 16 percent could not meet the market specifications. In the Northern Region, about 55.6 percent of the maize farmers meet the market specifications in the region, while about 44.4 percent were not able to meet the market specifications. For that of the Upper West Region, about 60 percent of the maize farmers were able to meet the specifications for the market, while 40 percent of them were not able to meet the specification for the market. However, in the Upper East Region, close to about 38.1 percent had the market specification, while the number of maize farmers who could not meet the specification were about 61.9 percent in the region.

For soy farmers, about 43 farmers who have available information were contacted for the comparison. Farmers in the southern sector who meet the market requirement was 100 percent, while none of them failed to meet the specifications. In the Northern Region, about 72.2 percent of the farmers were able to fulfill the market specifications, while close to about 27.8 percent of them could not meet the specifications for the market. Interestingly, the situation for the Upper West Region was different, while 50 percent of them met the market specifications, 50 percent were also not able to meet the market specification. The Upper East

Region also recorded about 30 percent as the number of Soy farmers who were able to meet the market specification. While about 70 percent of them could not meet the specifications for the market at the time.

In the rice farming industry, 54 number of rice farmers were contacted for the comparison since they had the available information. In the Southern sector, almost 88.9 percent of them were able to meet the rice market specification, while 11.1 percent of them could not meet the specification. Furthermore, that of the Northern Region rice farmers was different. While 57.1 percent of them had the market requirement for rice cultivation, 42.9 percent could not make up the market requirement. Interestingly, 100 percent of the Upper West rice farmers contacted had the market requirement and none of them failed to meet the market requirement as shown in Figure 6. In addition, half (50%) of the rice farmers contacted were having the market requirement and half (50%) of them could not have the market requirement.

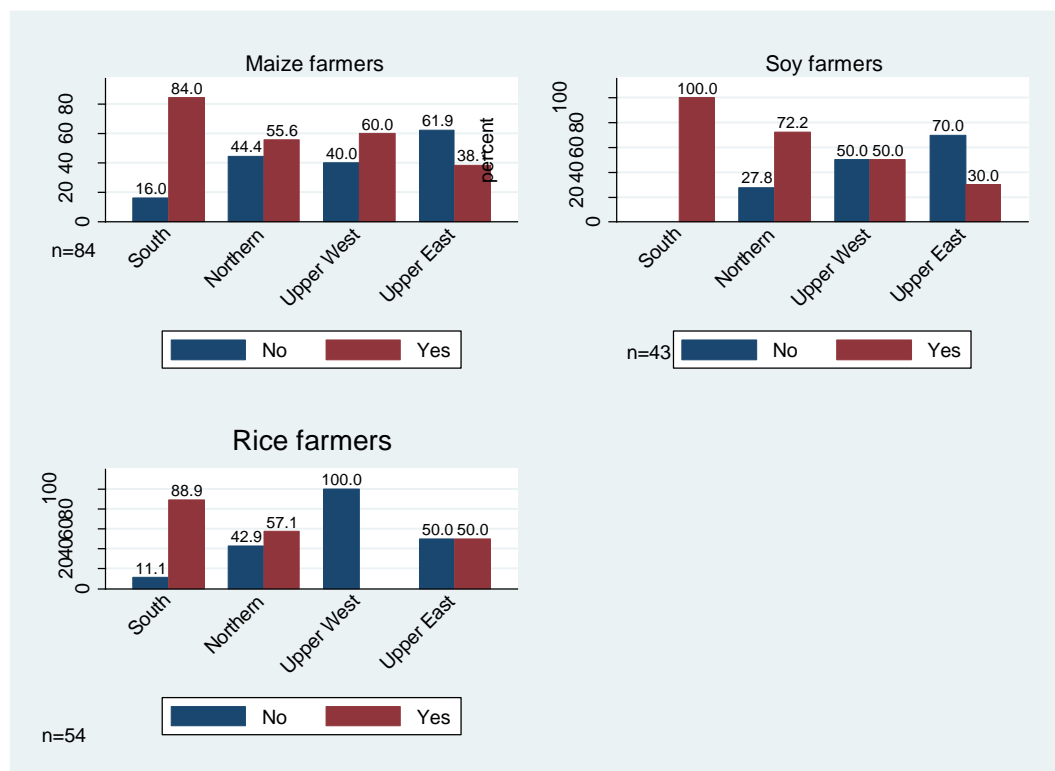


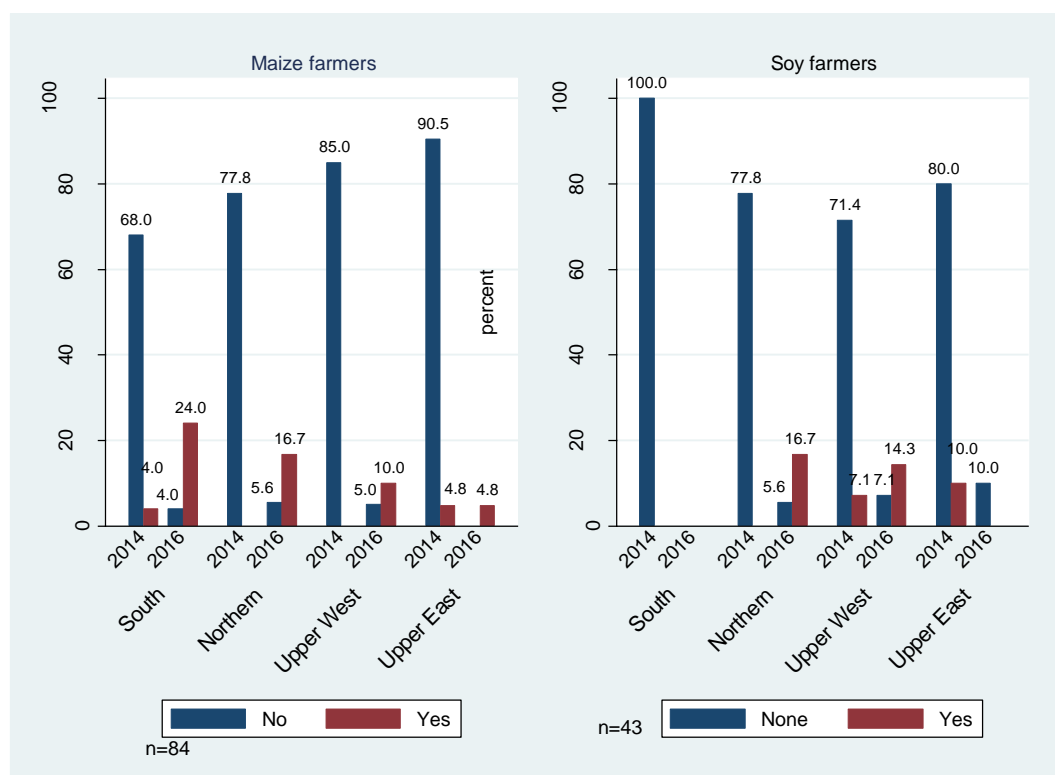
Figure 6: Meeting of market specifications among maize, soy and rice farmers

### 5.6.2 Contract agreement between 2014 and 2016 for maize and soy farmers

Figure 7 also portrays the percentage of maize and soy farmers who were under contract agreement for 2014 and 2016. From the graph, in 2014 about 4 percent of the farmers in maize farming in the southern sector were under contract agreement. However, the percentage increased in 2016 to about 24 percent in the region. Moreover, 68 percent of them had not contract agreement in 2014, while in 2016 the percentage decreased to four (4) percent in the 2016 for the region. In the Northern region, none of the farmers contacted in 2014 had contract agreement, but in 2016, close to about 16.7 percent of the maize farmers had contract agreement. Furthermore, about 77.8 percent of the maize farmers were not having contract agreement in 2014 but in 2016 this number decreased to 5.6 percent.

A similar situation was also identified in the Upper West Region. In 2014 none of the farmers had contract agreement. This, however, improved in 2016 when 10 percent of the maize farmers were identified as having contract agreement in the region. In addition, close to about 85 percent of the farmers contacted were not having contract agreement in the region in the 2014 season. The situation improved in 2016 when number reduced to five (5) percent as the number of maize farmers who do not have contract agreement in the region. In the Upper East Region, about 4.8 percent of them were having contract agreement and this percentage was maintained in 2016. For the number of maize farmers who do not have contract agreement in 2014, close to about 90.5 percent was recorded in that year.

Figure 7 also shows the percentage of soy farmers who were under contract for 2014 and 2016. 43 soy farmers were contacted due to their information availability. In all, 100 percent of the soy farmers in the Southern sector were recorded as not under any contract agreement in 2014. For the Northern Region, about 77.8 percent of the soy farmers were not having any contract agreement in 2014, but this percentage decreased to 5.6 percent in 2016. Furthermore, about 16.7 percent of the soy farmers had the contract agreement in 2016. In the Upper West region, 71.4 percent of soy farmers were under contract agreement while this percentage increased to 14.3 percent in 2016. On the other side, 71,4 percent of the soy farmers were not under any contract agreement in 2014, while 7.1 percent of the soy farmers in the region were not having any contract in the region and this depicts a significant reduction in 2016. For the Upper East Region, 10 percent of the farmers were recorded to be having contract agreement in 2014. For the number of soy farmers who did not have any contract agreement, 80 percent was recorded in 2014, while the percentage decreased to 10 percent in 2016 in the region as shown in Figure 7.



**Figure 7: Maize and soy farmers with contract agreement in 2014 and 2016**

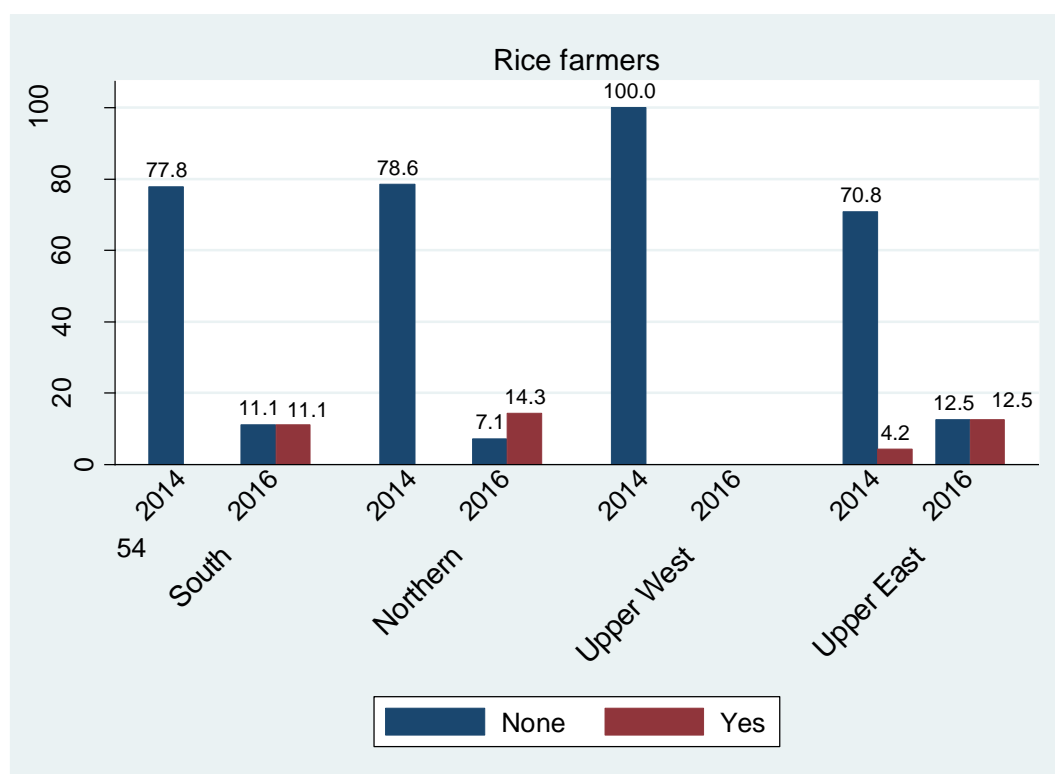
**Source:** Fieldwork Data, 2017



### 5.6.3 Contract agreement between 2014 and 2016 for rice farmers

Figure 8 also provides a graphical view about the percentage of rice farmers who were under contract agreement. About 54 rice farmers with available information were used for this comparison. From the figure, about 77.8 percent of the rice farmers were not under contract agreement in the 2014 season but this percentage decreased to 11.1 percent in 2016. Furthermore, 11.1 percent of the rice farmers in the region were recorded as having contract agreement in the 2016 season.

In the Northern Region, 78.6 percent of the rice farmers were not having contract agreement in 2014 but this percentage decreased to 7.1 percent in the year 2016. However, 14.3 percent of the rice farmers were having contact agreement in the region. For the Upper West Region, 100 percent of the farmers were not having contract agreement in 2014. In the Upper East Region, about 70.8 percent of the farmers were not having contract agreement in 2014 but this decreased in 2016 to 12.5 percent. Moreover, in 2014, 4.2 percent of the farmers were having contract agreement but this increased to 12.5 percent in 2016 in the region.



**Figure 8: Rice farmers with contract agreement in 2014 and 2016**

Source: Fieldwork Data, 2017

### 5.7 The Volume Supply of Smallholder Farmers

This section considers the volume of supply of the smallholder farmers. The volume of supply is the portion of farm output that was actually sold in the market by the smallholder farmers. The data set used for the analyses is the 2017 fieldwork data. The fieldwork data were used for descriptive distributions using graphs for the volume of supply in the 2014 and 2016 farming seasons.

### 5.7.1 The volume supply of maize, soy and rice

Figure 9 shows the volume of supply of maize, soy and rice across the four regions for the years 2014 and 2016 measured in metric tonnes. Concerning the maize farmers, the overall average volume of supply in 2014, the period before the FaaB training was 4.2 MT compared to the 2016 season where volume supply increased to 6.53MT registering an increase in supply of 2.24 MT. After the FaaB training the farmers in the South (Ashanti and Brong Ahafo) recorded volume of supply maize production of 4.95 MT which is higher than the other regions. The rest of the volume of supply across the two farming seasons and crop types are depicted in Figure 9.

Further, the general volume of supply of rice has also increased by 0.23 MT between 2014 and 2016 from 2.27 to 3.33 MT. Farmers in the upper East region recorded volume of sales of rice of 0.85 in the 2014 farming seasons, however after the FaaB training the volume of sales increased to 1.08 MT. For the Northern region, the volume of sales increased from 0.62 in 2014, after the training the volume of sales increased to 0.95 MT. Beneficiary FaaB farmers in the South increased their volume of sales of rice from 0.8 MT to 1.3MT between 2014 and 2016 farming seasons respectively. The beneficiary Farmers of FaaB training also increased between the 2014 and 2016 farming seasons.

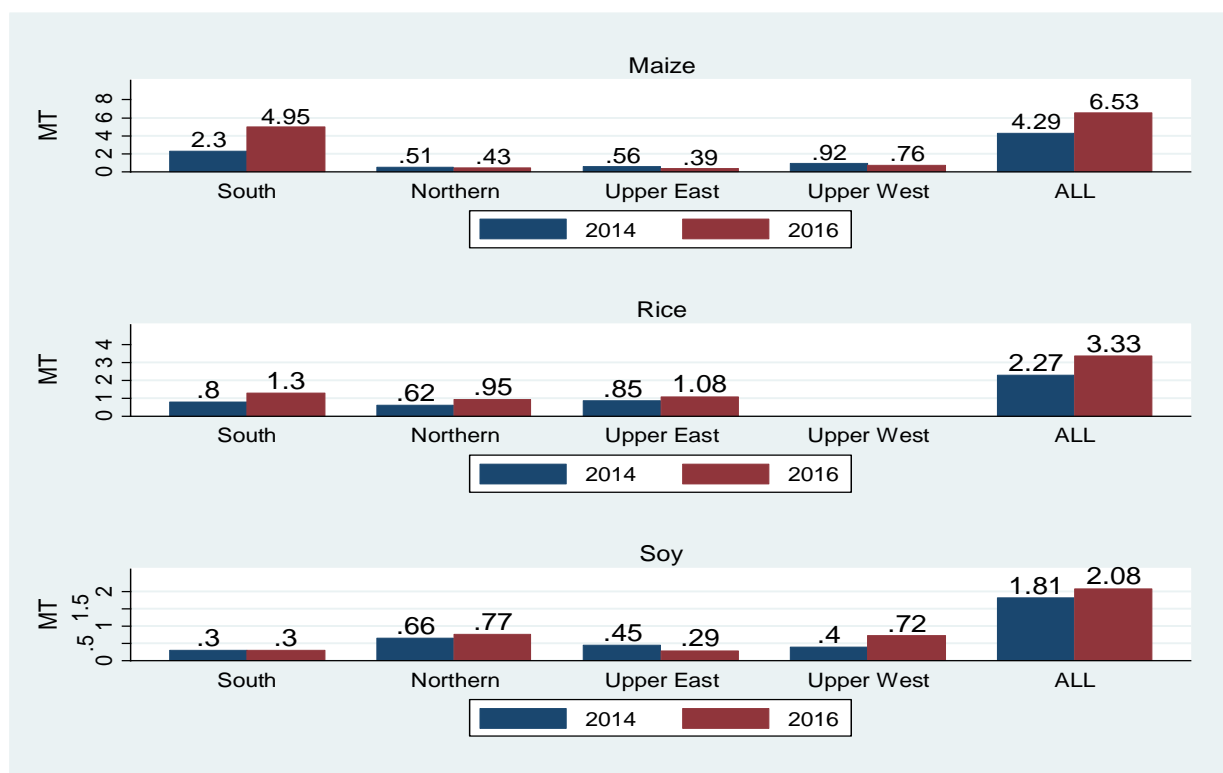


Figure 9: Volume of supply across crop types

Source: Fieldwork Data, 2017

### 5.8 Identifying the Types of Farmers who are Making Use of Knowledge Application

Knowledge application is an essential component of the FaaB training program. It is, thus, imperative to identify whether it is the male or the female farmers that are making the most use of the training applications on their farms. From the figure, 76.3 percent of the females are applying the knowledge from the FaaB compared to a lesser proportion of their male counterparts of 66.7 percent. Though the female farmers have a high proportion of application of knowledge from the FaaB, the difference is not significantly statistical as indicated by the chi-square values. In terms of the qualitative response to this objective, Opoku Agyeman, an OB in the Nkoranza South stated, “Some of the females also do well. They work hard but at times they are helped by their husbands as you know for females if a man doesn’t support them, their work is in a certain manner”. He concluded that as far application is concerned both the male and the female farmers are all actively involved since they have all understood that farming is a business through the training from ADVANCE. However, Alhaji Zakaria Alhassan, an OB in the Northern Region, was of the view that male farmers apply the knowledge most compared to that of the female farmers as this is reflected in the distinctively high output of the male farmers compared to that of the female farmers. In contrast, Salem, CDO in the Kintampo South is of a contrarily view. He observed that female farmers easily apply the knowledge from their FaaB training because they “easily believe the demonstrations from ADVANCE”.

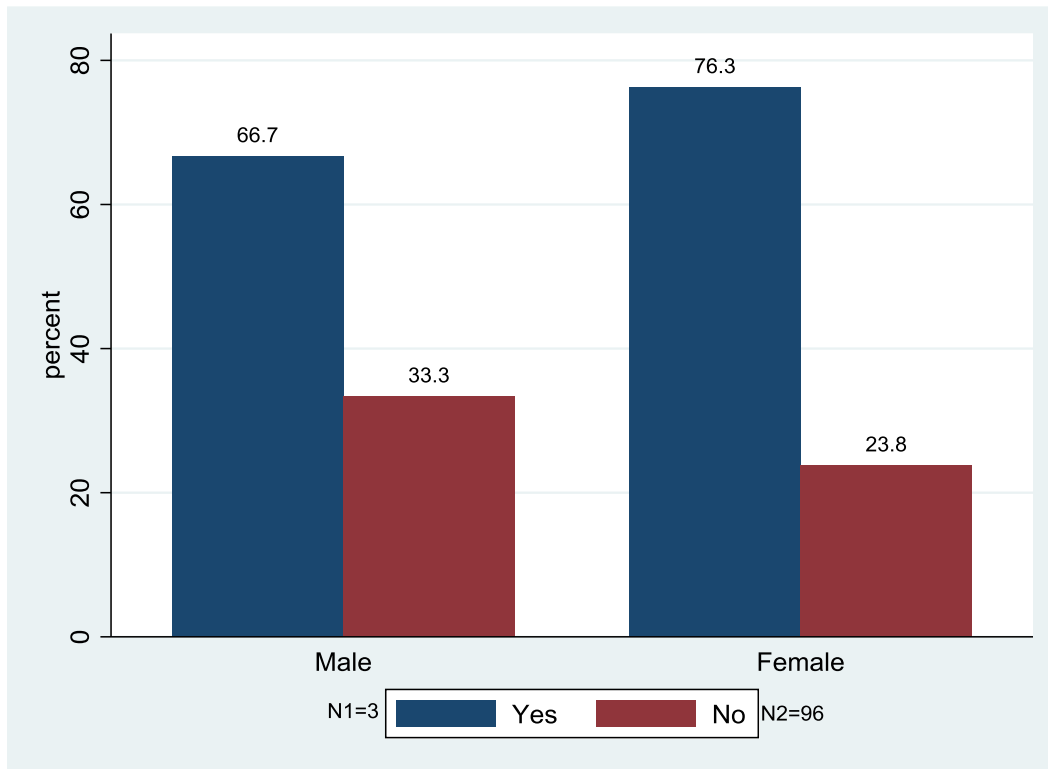


Figure 10: Knowledge application by sex of respondents

Source: Fieldwork Data, 2017

## 5.9 Beneficiary Farmers who can Perform Basic Numeracy

The proportions of the beneficiary farmers who can count basic numbers and do simplified identification of numbers are depicted in Figure 11. From Figure 11, all the beneficiary farmers in the Northern Region can count basic numbers compared to about three out of every four farmers in both Upper West and the Upper East regions with the differences between the regions being statistically significant. This pattern is similar to the beneficiaries who can do simple identification of numbers. However, in the case of the latter, the differences across regions are weakly significant.

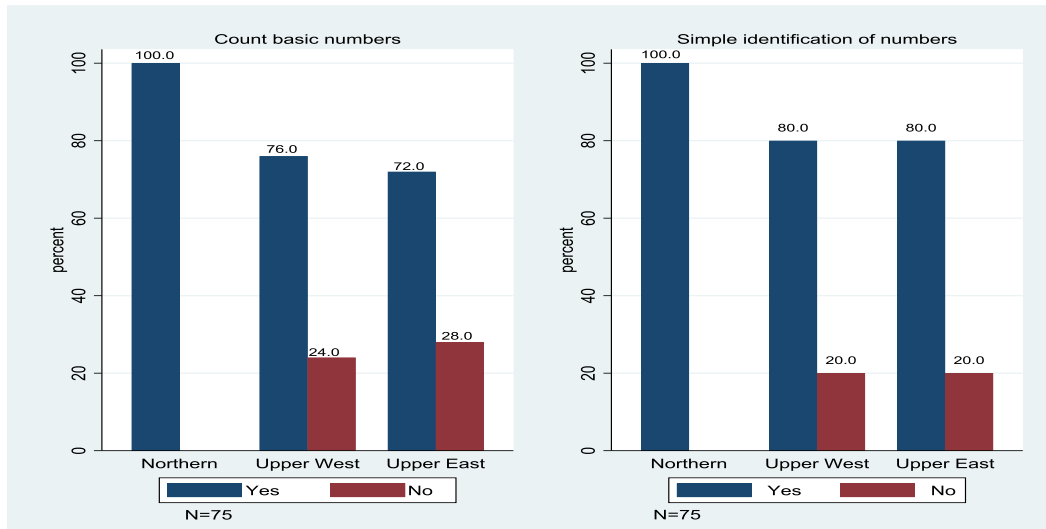


Figure 11: The proportion of beneficiary farmers who can identify simple numbers and do basic counting

### 5.9.1 Proportion of beneficiary farmers of numeracy training that can read basic notes and identify various cedi denominations

From Figure 12, almost all the smallholder farmers could identify the various denominations of the Ghana Cedis. However, this is not the case regarding the reading of basic notes and labels where the Northern Region again maintained a healthy proportion of the farmers in this category. Upper East and Upper West Regions still recorded as low as only one (1) out of every four (4) smallholder farmers who could read basic labels. This has implications for knowledge application of the smallholder farmers. The distributions are shown below.

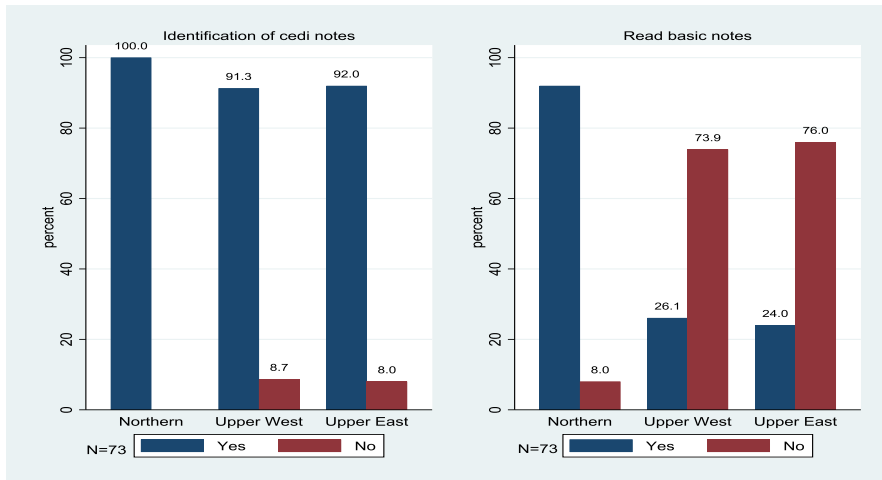
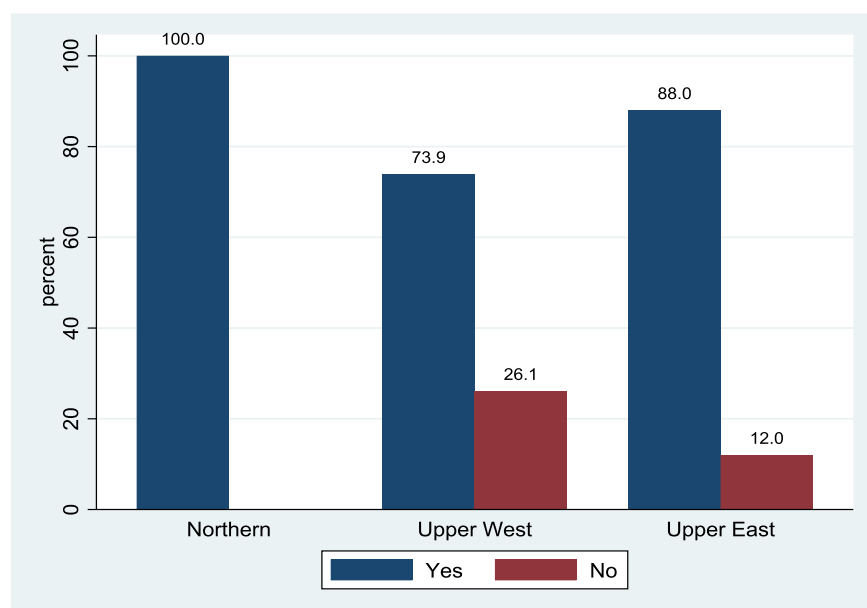


Figure 12: Beneficiary farmers who can read basic notes and identify various cedi denominations

### 5.10 Evidence of Record Keeping on their own with Little to no Support from Other People

Figure 13 shows a graphical evidence of the application of fertilizer among the three regions in the northern part of Ghana. From the figure, it was evident that all the farmers who were contacted have started keeping records of their fertilizer application process, after the FaaB training in 2015. In the Upper West region, close to about 73.9 percent of the farmers have started keeping records of the amount of fertilizer they apply and the various stages of the applications. However, about 26.1 percent of the region's farmers were not keeping records of their fertilizer application process after the training in 2015. For that of the Upper East region, evidence shows that after the training, about 88 percent of the farmers were keeping records of their fertilizer application in the region, while about 12 percent of them were not keeping records of the way they were applying fertilizer in their farm lands.

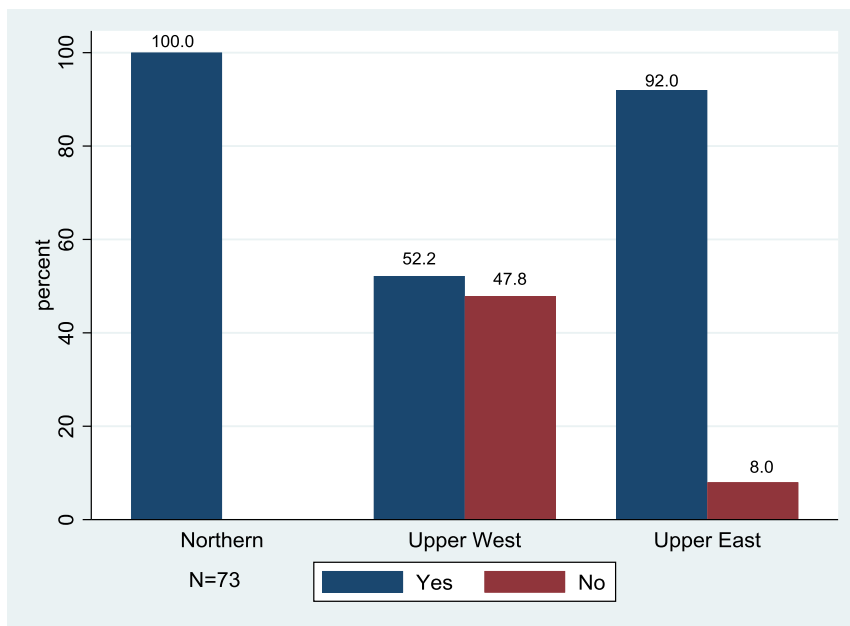


**Figure 13: Evidence of record keeping on Fertilizer application after the training**

Source: Fieldwork Data, 2017

#### *5.10.1 Evidence of record keeping on the quantity of seeds for planting*

Figure 14 also gives a graphical evidence of the percentage of farmers who have started keeping records about the quantity of seeds for planting. From the figure, 73 farmers were used to depict this evidence. In the Northern Region 100 percent of the farmers contacted have started keeping records about the quantity of seeds they use for planting after the training. In the Upper West Region, 52.2 percent of the farmers have started keeping records of the number of seeds they plant on their farm land, while 47.8 percent of the farmers were not keeping records of the quantity of seeds they apply for planting. Furthermore, for that of the Upper East Region, it can be realized from the graph that about 92 percent of the farms have started keeping records of the number of seeds they plant in their farm land and this shows evidence of some improvement in their farming practices. However, eight (8) percent of these farmers have still not started keeping records of the quantity of seeds they plant on their farmlands.

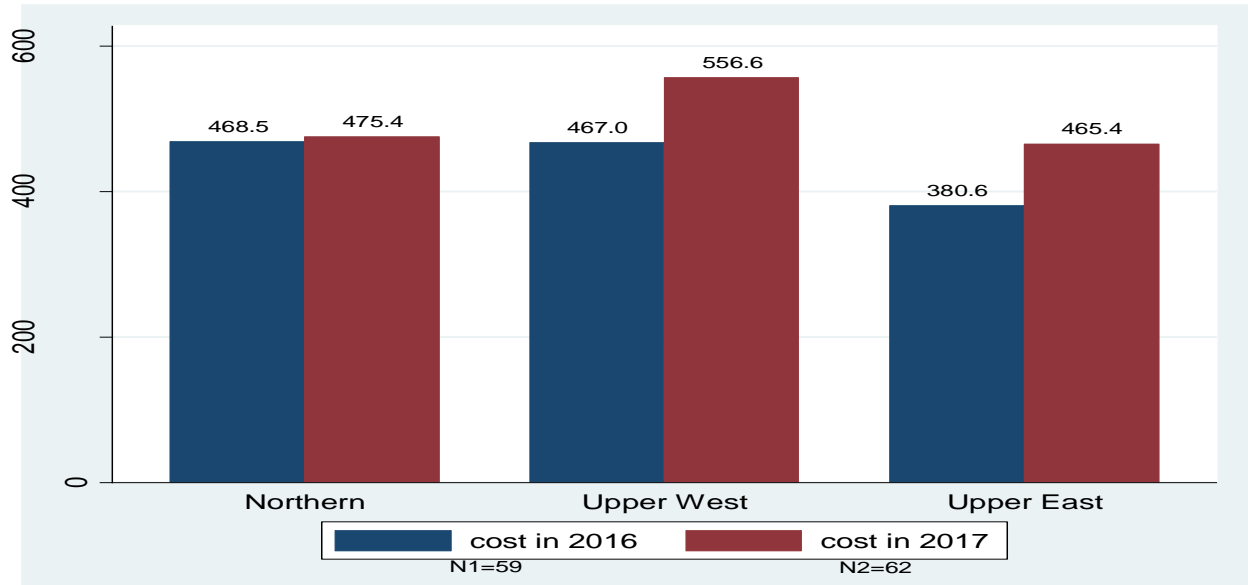


**Figure 14: Evidence of record keeping on the number of seeds planted**

Source: Fieldwork Data, 2017

### ***5.10.2 Farmers estimated cost and sales of their production for the just ended production season***

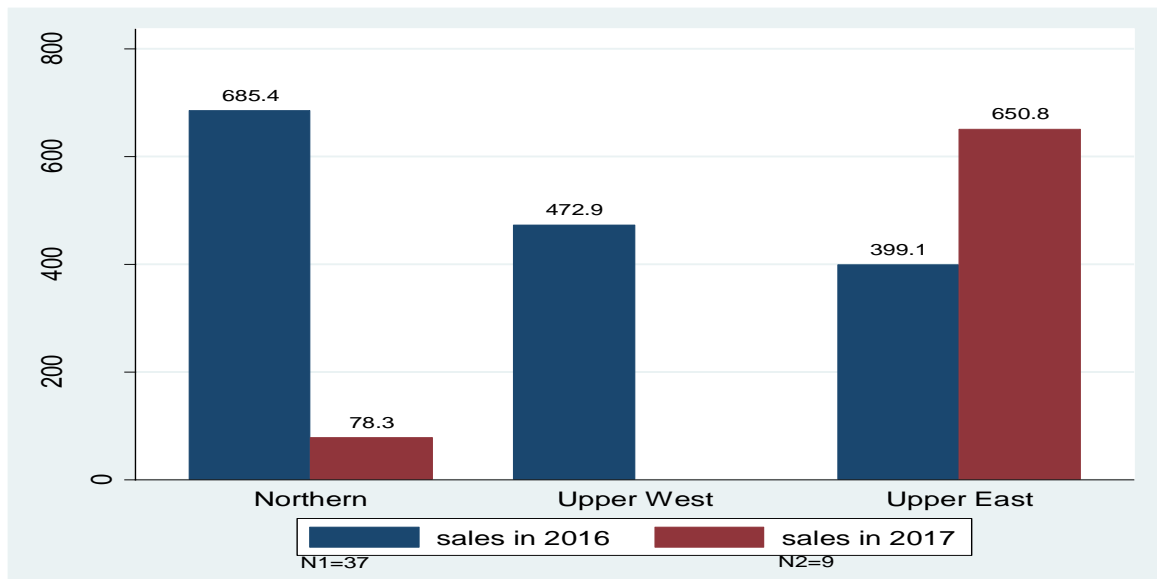
This section shows the farmers estimation cost of production for the production years 2015 and 2016. As shown in Figure 15, farmers generally had started estimating the cost of their production. For instance, a glimpse of the figure suggests that in the year 2016, out of the total of 73 farmers under Numeracy training, 59 of them representing about 80.8 percent had estimated their cost of production for that year. Thus, the average cost of production for the year 2016 according to the farmers in the Northern Region stood at GH¢488.50 for the year 2016. For those in the Upper West Region, the average estimated cost of production stood at GH¢467.0 for the year 2016. For their folks in their Upper East, the estimated average cost of production was GH¢380.80 for the years 2016. In the period 2017, the number of farmers who had estimated their cost of production had increased substantially. For instance, out of the total of 73 farmers, 62 of them representing about 84.9 percent indicated that on the average the total cost of production for the 2017 was GH¢475.40 for the case of Northern Region, GH¢556.60 for Upper West Region and GH¢465.70 for Upper East Region. The figure gives an indication that farmers have started estimating their cost of production.



**Figure 15: Farmers estimated cost in the production years 2016 and 2017**

Source: Fieldwork Data, 2017

Regarding farmers' estimation of their sales of production, Figure 16 gives evidence that farmers had already started estimating their sales from production. Thus, Figure 16 shows that from 2016 to 2017, farmers across the three regions had estimated their sales of productions.



**Figure 16: Farmers estimated sales in the production years 2016 and 2017**



### ***5.10.3 Tracking of prices at various markets to fix selling prices***

From the interview with the OBs and key informants provided the signal that farmers are tracking prices before they fix their selling prices. An interview with Opoku Agyeman, an OB in the Nkoranza South District, revealed that some farmers can even travel to far away markets to find out the prices of maize at other markets before selling the maize in their very community. Also, according to Emmanuel Kintoh, an OB in the Kintampo South district, the smallholder farmers always have price options. He said, “Oh I am not the only maize buyer, some go to Kintampo market, Techiman market and even there are some middlemen from Accra, Kumasi and others so those they know, they ask of the prices of maize so before even I get there they know the price.”

### **5.11 Is there a Difference between the Knowledge Used by Women and Men?**

Figure 17 also shows a graphical evidence of the percentage of the farmers who are applying their knowledge after the training program. On the whole, 73 farmers were contacted due to their available information. From the figure, it can be realized that about 93.8 percent of the male farmers were applying the knowledge they acquired from the training, while 6.3 percent of them were not.

For the female farmers, about 89.5 percent of them were applying the knowledge they acquired on their farmlands after the training, while 10.5 percent of them were not.

On regional basis, about 100 percent of the male farmers in the Northern Region were applying their knowledge, while no record was obtained for those who were not applying. Also, 100 percent of the northern females were also applying their knowledge after their training. In the Upper West Region, 82.8 percent of the female farmers were applying their knowledge while 17.4 percent of them were not. For the Upper East Region, 75 percent of the male farmers were implementing their knowledge in their farming activities while 25 percent of them were not. Furthermore, 90.5 percent of the female farmers in the region were applying their knowledge in their farming activities after the training, while 9.5 percent of them were not after the training.

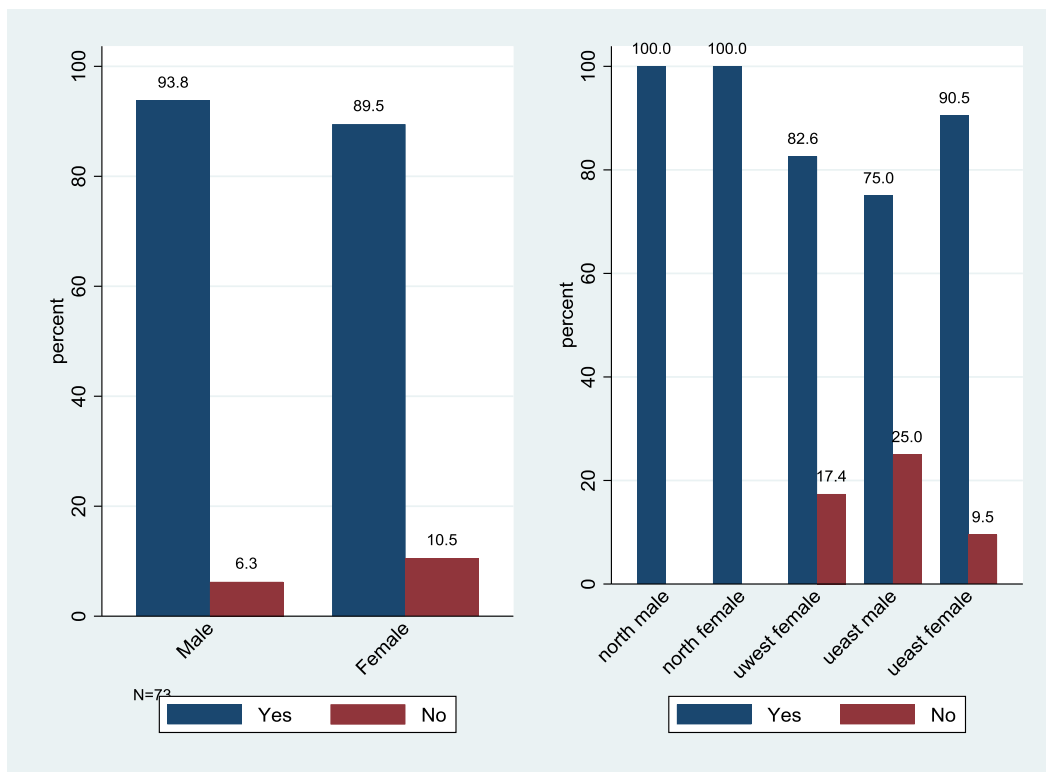


Figure 17: Knowledge application across male and female farmers

Source: Fieldwork Data, 2017

## 6.0 Key Observations

The key observations are grouped into FaaB and Numeracy trainings below:

The findings regarding the FaaB training are:

- Beneficiary maize farmers of FaaB training increased their farm sizes by 0.3 acres between the 2014 and 2016 farming seasons. Similarly, beneficiary rice farmers increased their farm sizes (area cultivated) by 0.3 acres between the same period. However, that of beneficiary soy farmers recorded a decrease in farm sizes by 0.8 acres between 2014 and 2016 farming seasons using the 2017 Field Data.
- The average size of maize farms for beneficiary FaaB farmers in the South (6.5 acres) is twice that of the Northern (2.0 acres), Upper West (2.3 acres) and Upper East (1.7 acres) using the 2017 Field Data.
- The yield per acre of the beneficiary smallholder farmers increased between the 2014 and 2016 farming seasons. After the FaaB training in 2015, smallholder maize, rice and soy farmers increased their yield by 1.2 MT, 1.8MT and 0.32MT, respectively.
- Beneficiary maize and soy smallholder farmers of FaaB training increased their profit margin by GH¢937.7 and GH¢ 158, whereas that of rice farmers recorded a decrease of Gh¢222.8 using the 2017 Field Data

- Volume of supply of beneficiary FaaB farmers of maize, rice and soy increased between the two farming seasons by 2.24 MT, 1.06MT and 0.27MT, respectively.
- More than three (3) out of every four (4) maize farmer practiced row planting after the FaaB training.
- After the FaaB training, more than three quarters of the maize beneficiary FaaB farmers applied fertilizer compared to soy (53.49%) and rice farmers (46.30%).
- The rate of adoption of the usage of certified seeds for planting is barely average among the beneficiary smallholder farmers after the FaaB training, with 53.57, 48.84 and 37.04 percent of the maize, soy and rice farmers, respectively currently using certified seeds.
- Out of the beneficiary FaaB farmers, more than three (3) out of every four (4) maize farmers in the project South Region were meeting their market specification compared to 72, 50, and 30 percent of their counterparts in the Northern, Upper West and Upper East regions, respectively.
- Currently, 61 percent of the maize farmers are meeting market specifications compared to 55.81 and 51.85 percent for the soy and rice farmers, respectively. The limitation of the field data applies to this case as well.

The findings regarding the Numeracy training are:

- About three (3) out of four (4) beneficiary smallholder farmers of Numeracy training can do simple identification of numbers.
- After the Numeracy training, 85 percent of the smallholder farmers in the North can read basic notes compared to 26.1 and 24.0 percent in the Upper West and the Upper East region, respectively.
- In terms of record keeping, 100 percent of the Northern region's farmers were keeping records of their farming activities compared to 52.2 and 47.8 percent in the Upper East and Upper West regions, respectively.
- After the Numeracy training, 80 percent of the farmers (59 out of 73) have estimated their cost of production in the year 2016. This proportion increased to 84 percent in the year 2017 corresponding to 62 out of the 73 smallholder farmers.
- About 51 percent of the smallholder farmers (37 out of 73) were able to record their sales after the Numeracy training in the year 2016. However, in 2017, only 12 percent of the smallholder farmers (9 out of 73) were able to keep record on their sales.
- After the Numeracy training, 93.8 percent of the male farmers are making use of the knowledge acquired from the training compared to the female farmers of 89.5 percent.

## 7.0 Conclusion

Over all, the study outcomes indicate that beneficiary smallholder farmers of the FaaB and Numeracy trainings have made some progress in some areas of their farming and marketing practices such as increasing their scale and yield of production, implementing good agronomics and post-harvest handling practices, ability to do simple identification of numbers and various cedi notes. However, other important indicators such as the profit of the smallholder farmers, ability to meet buyer specifications, and contract terms, and reading basic notes continue to fall short of the desired expectations.

## 8.0 Lessons Learnt and Recommendations

The lessons learnt are as follows:

- Given that farm sizes increased only marginally for maize and rice, and even decreased in the case of rice, the correlation between farm sizes and the FaaB training is not substantial.
- Beneficiary smallholder farmers of FaaB training recorded different farm sizes after the FaaB training. The smallholder farmers in the Upper East region recorded lowest farm sizes.
- Given that the effect of the trainings on the profit margin of the smallholder farmers is greater in maize than soy and rice. It is therefore recommended that the training should elaborate further on meeting market specifications and buyer requirements independently for each of the crops.
- Given the average adoption of the usage of the certified seeds, the trainings should reiterate the need for the farmers to form Village Savings and Loans (VSLs) group for the farmers to mobilize savings within themselves for the purchase of the right seeds during the planting season.
- The FaaB trainings should further emphasize the need for every smallholder farmer to belong to an FBO in order to attract bulk buyers.
- The FaaB and Numeracy trainings should bring out practical approaches of linking potential buyers to the beneficiaries.
- Should be made accessible to the smallholder farmers since this certified seeds are costly.

