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Willingness of Rural and Peri-urban Women Smallholder Farmers to Participate in Home-grown School Feeding Farming Contracts

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By Georgette Owusu-Amankwah

Abstract

Conventional school feeding programs in developing economies have often been operated using international food aid to improve nutritional and educational outcomes of the most vulnerable school-age children. Home-Grown School Feeding (HGSF) programs on the other hand, refer to a framework in which the school feeding is administered using food that is locally grown by smallholder farmers; this mechanism is designed to link school feeding with local agricultural production, with a two-fold objective of increasing children's well-being as well as promoting local agricultural production and development by generating demand for small-holder farmers' output.

Using survey data from 150 households in rural and peri-urban communities in Ghana, this study examines the binding constraints facing smallholder farmer when deciding to participate in a school feeding farming contract. The study elicits responses from both the male household head and a secondary respondent, typically a woman farmer to examine whether cash flow or market risk constraints are binding. The research uses preliminary descriptive results to assess whether farmers who receive an initial payment are more willing to participate in the school feeding program contract, than farmers who receive no initial payments and how these differ by gender.

Keywords: smallholders, women farmers, food security, willingness to participate, school lunch farming contracts

1.0 Introduction

According to FAO, IFAD, UNICEF, WFP and WHO (2017) global hunger is on the rise again after significant declines for over a decade. Hunger and food insecurity affect 815 million people worldwide (11% of the global population), with 207 children suffering from stunted growth and wasting. In sub-Saharan Africa alone, about 243 million people (22.7% of Africa's population) face hunger, food insecurity and deteriorating nutrition (FAO, IFAD, UNICEF, WFP and WHO, 2017). Women and children are the most vulnerable populations affected by hunger and malnutrition.

International food aid has largely been debated as the solution to global hunger, malnutrition and food security. Recent studies have re-examined the efficacy of food aid in sub-Saharan Africa and found that although it does not have a significant disincentive on per capita agricultural productivity after controlling for endogeniety (Abdulai, Barrett & Hoddinott, 2005), food aid reduces the number of producers, thus decreasing local production and aggregate nationwide output (Ferrière & Suwa-Eisenmann, 2015).

Meals to school children is a common type of food aid extended to countries in sub-Saharan Africa. Conventional school feeding programs in developing economies have often been operated using international food aid to improve nutritional and educational outcomes of the most vulnerable school-age children. Home-Grown School Feeding (HGSF) programs on the other hand, refer to a framework in which the school feeding is administered using food that is locally grown by smallholder farmers; this mechanism is designed to link school feeding with local agricultural production. Thus HGSF programs have a win-win outcome for both school children and local farmers. As emphasized by Espejo et al. (2009), HGSF have the two-fold objective of increasing children's well-being as well as promoting local agricultural production and development by generating demand for small-holder farmers' output.

Evaluations of the HGSF program in Ghana have revealed improvements in child nutrition (Danquah, Amoah, Steiner-Asiedu & Opare-Obisaw, 2012; Owusu, Colecraft, Aryeetey, Vaccaro & Huffman, 2017) as well as school attendance and performance (Abotsi, 2013). However, little success has been achieved in linking the Ghana school feeding program (GSFP) to local agricultural development (USDA 2009a; Sulemana, 2016).

Contract farming has been examined as an institutional arrangement that can reduce transaction costs in food supply chains and solve market imperfections in linking smallholders to markets (Oya, 2012) thereby improving farm productivity and incomes of smallholders (Maertens and Velde, 2017). Extant literature have investigated the welfare impacts and benefits of participating in farming contracts on smallholders in developing economies (Barrett, Bachke, Bellemare, Michelson, Narayanan & Walker, 2012; Bellemare, 2012; Maertens and Velde, 2017).

For example, Maertens and Velde (2017) analyze how participation in contract-farming in the rice sector in Benin affects smallholder production. Their findings indicate that contract-farming results in expansion of the area of rice farmed, rice commercialization and intensification of rice production, higher farm-gate prices and increased income. However, very few studies have examined the willingness of smallholder farmers to participate in contracts (the exception is Abebe, Bijman, Kemp, Omta & Tsegaye, 2013) or the preferences of smallholders for particular contracts. A number studies have also focused on smallholder contracts with supermarkets (Michelson, 2013), export firms and national schemes. Yet, to date, no known study has examined how contracts can be used to link smallholder contracts to school lunch programs.

In this paper, we examine the willingness of smallholders to participate in a school lunch contract based on advance payments, flexible delivery times of the crop as well as flexible prices to match price volatility between bumper harvest times and peak season before the next planting season. The study focuses on maize and beans because maize as is the most commonly distributed and consumed staple food in Ghana and this combination provides a nutritionally balanced meal option for school children. It further provides a diverse range of crops for the livelihood of smallholders, especially women farmers, and increases access to healthy, balanced meals for their families as well.

The remainder of this paper is structured as follows: section 2 provides a literature review about women in agriculture, section 3 presents the background of the study, section 4 explains the survey design and data collected and section 5 presents some preliminary descriptive results.

2.0 Women in Agriculture

Engaging in productive activities empowers women and enables them to contribute to development within their economies (Woldie and Adersua, 2004). According to FAO (2011), female labor-force participation rates in sub-Saharan Africa ranks among the highest in the world. Even though women make up about 80% of the labor force they are often involved in the informal sector (Aderemi et al, 2008), unpaid (Doss, 2011) and often do not have the same opportunities as men (Woldie and Adersua, 2004) undermining the potential economic contribution of women to employment creation and wealth generation in sub-Saharan Africa.

In sub-Saharan Africa, women often pursue self-employment as means to alleviate poverty, unemployment and gender-based occupational segregation (Remi-Alarape, Adetayo and Nassar, 2009; Woldie and Adersua, 2004). For example, in Nigeria women are often restricted from operating competitive businesses due to low education and lack of skills required and support system for setting up competitive businesses (Woldie and Adersua, 2004). Goedhuys and Sleuwaegen (2010) use a quantile regression approach to analyze the growth performance of entrepreneurial firms in 10 manufacturing sectors of 11 sub-Saharan African countries. The authors observe no statistical difference between male and female entrepreneurs except in the lowest deciles. Their results may imply that when women are fully empowered, they contribute as equally as males to growth and development in any sector of any economy.

In terms of farm numbers, Ghanaian agriculture is dominated by small-scale farming with about 80 percent of the total number being small-scale. In Ghana's agriculture, women are vital participants; they make up more than 50% of agricultural labor force and produce 70% of the country's food stock (SEND-Ghana[1], 2014). However, according to a policy brief issued by SEND-Ghana (2014) women farmers have not benefited as much as men farmers in government-led agricultural programs such as the Northern Rural Growth Program, the Fertilizer Subsidy Program and the Agricultural Mechanization Service Centre. Creating a level playing field for men and women farmers with regards to access to productive resources in the agricultural sector is one

[1] Social Enterprise Development (SEND) Foundation of Ghana is an organization with specialty in policy research and advocacy focusing on pro-poor policy and development program monitoring in Ghana. Its mission is to promote good governance and equality of men and women in Ghana. It was involved in monitoring the performance of GSFP at the district level.

of the fundamental means of simultaneously increasing the supply of nutritious food while increasing the incomes of women farmers (SEND-Ghana, 2014).

A study by Kilic et al. (2015) explores the factors affecting gender differences in agricultural productivity among 16,372 farm plot managers in Malawi. Their findings indicated that 80% of the gap was due to average differences in access to inputs. The main constraints of the female managers were lower inorganic fertilizer use, lower production of high-value export crops, lower use of adult male labor and restricted access to agricultural tools. Similarly, Aguilar et al. (2015) assess gender differences in agricultural productivity among 4 of the largest regions in Ethiopia. The authors found a gender gap of 23% with land area and child dependency ratio being the main factors contributing to the observed gender differences. Factors widening the gender gap included household size, food consumption and rented land. Moreover, access to extension services, weekly hours in agricultural activities, the number of fields managed, field certification, land size, distance to household, use of fertilizer and oxen availability were factors that influenced unequal returns on characteristics; and constituted a larger portion of the gender gap than mere differences in gender characteristics. This implied that making productive assets available to females would only minimize the gap but not close it entirely.

Within developing countries, regional differences often call for differentiating studies to better comprehend the different dynamics in such regions and offer more suitable policy recommendations. Using data on 4,240 farm plots Oseni (2015) examined gender differences in agricultural productivity across the Northern and Southern Regions of Nigeria. In the Northern Region, the study found a gender gap of 27% with the factors contributing to the gender gap being adult labor pool, lack of fertilizer use and hired labor. Land area was identified as the only factor that could minimize the gender gap. In the Southern region, the study found a gender gap of 24% and identified lack of herbicide use and more male labor days as main factors contributing to the gap. The presence of more adult females with access to larger farms in the household was identified as a factor that could attenuate the gender gap.

A plethora of research has documented the gender-specific constraints faced by African women small holder farmers (Doss, 2001). Some research has focused on innovations that address the productive needs of women small-scale farmers. Quisumbing & Pandolfelli (2010), for example, review interventions and policy changes that attempt to increase small-scale women farmers'

access to and control of productive resources in sub-Saharan Africa. They focus on efforts aimed at addressing the needs of poor women farmers in issues related to land, new varieties and technologies, access to market, credit and financial services as well as social infrastructure and support services.

There is a paucity of research on the willingness of women smallholders to participate in school lunch contracts, smallholder preferences for school-lunch contracts and how the linkages contracted between a school-lunch program and smallholders can induce local agricultural development, reduce poverty, malnutrition and food insecurity.

3.0 Background of Study

In 2005 the government of Ghana launched a home-grown school feeding program, a poverty reduction and access to primary education strategy, in line with the comprehensive Africa Agricultural Development Program (CAADP) goals on hunger, poverty and nutrition. The Ghana School Feeding Program (GSFP) was implemented to provide one hot nutritious meal a day for school-going pupils in 10 pilot kindergarten and primary schools in each of the 10 regions of Ghana.

The introduction of the GSFP was expected to induce the smallholder farmers to expand their farms and produce more to meet the increased demand of food by caterers to feed school children, thereby increasing the incomes of smallholder farmers and improving the nutritional status of both the school children and the smallholder farmers. According to Sulemana (2016) the success in linking the GSFP to local agricultural development requires active participation of school level governance structures[2], school food caterers, small-holder farmers and local food traders as they are the key players involved in the procurement of food under the GSFP.

Figure 1 shows the current actors in the provision of GSFP lunches. The Ghana School Feeding Secretariat has national, regional and district offices. The GSFP national secretariat collaborates

[2] School level governance structures include members of each school's Parent-Teacher Association and School Management Committees which together for a School Implementation Committee to be in charge of the GSFP at the school and community level.

with the Ministry of Gender, Children and Social Protection to implement the feeding program. The district secretariat recruits school caterers, monitors their catering activities and requests payments to be released from the Ministry to the caterers, via mobile electronic financial systems, after they have prepared and served food to the school children. Along the supply chain, the GSFP mandates that school caterers procure food 80% items from local smallholder farmers. However, because this mandate is not streamlined and enforced, caterers purchase nearly all their food items from the central market. The caterers often purchase imported, processed food items which have a longer shelf-life and are easier to store thus defeating the local agricultural development objective of the home-grown feeding program. The dashed line is the link between local smallholder farmers and school caterers that can be facilitated by school-lunch contracts.

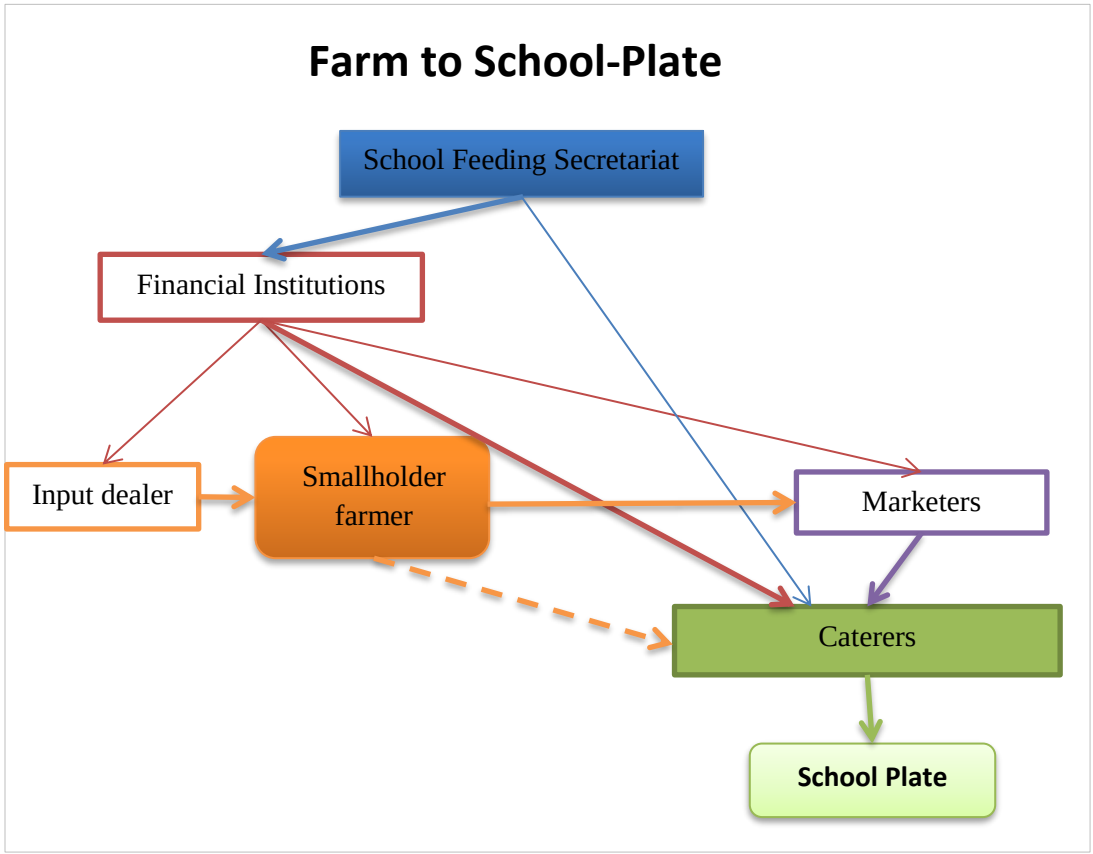


Figure 1. *Diagram indicating flow from the Secretariat to School-table.*

4.0 Survey Data

4.1 Sampling strategy

The objective of the study is to examine the potential and motivation of smallholder farmers to participate in farm-to-school-lunch contracts in the Northern Region of Ghana. Additionally, the study seeks to explore how more local women farmers can be integrated into school feeding programs. Thus the study adopts two sampling strategies so as to oversample women farmers in the sample for the study. The first sampling strategy generates a representative subsample of smallholder farmers who live in rural and peri-urban areas in the Northern Region of Ghana while the second sampling strategy generates a representative subsample of women smallholder farmers.

The survey instrument was implemented in 6 communities; 3 rural and 3 peri-urban communities within 2 districts in the Northern region of Ghana. A total sample of 150 households were randomly selected; 25 households from each of the 6 communities. Out of the 25 households selected in each community, 15 were selected using the representative household sampling strategy and 10 households were selected using the women farmer sampling strategy. Unlike other related studies whose sampling frames are drawn from selected Farmer Based Organizations (FBO) and fail to capture key characteristics at the community level, the sampling frame for this research focuses on the community as a whole and thus captures a representative sample of rural farm households. Additionally, smallholder women farmers make up only about 5% of farmer based organizations in Ghana thus using FBO's as a sampling frame might exclude or bias our second subsample of interest.

To obtain the sample of interest – consisting of the representative subsample of households and the women farmer subsample - two different sampling frames were employed.

A. *Sampling strategy for representative subsample of households*

The representative subsample of households makes up 60% of the total sample for the study. A systematic random sampling technique is used to select 15 households from each of the 6 communities, generating a subsample of 90 representative households. A random starting point was selected within each community, and then every fifth house was selected to be interviewed as part of the sample.

B. Sampling strategy for women farmer subsample

The women smallholder sample comprised 40% of the total sample. While responses for the representative subsample were being collected, a list of 268 women farmers who cultivate either maize and/or legumes and are substantially and actively involved in the decision making of their farming activities was simultaneously collected from the interviewees. Using this list as a sampling frame 10 women farmer households were randomly selected from the 6 communities to be interviewed, generating a subsample of 60 women farmer households.

In each of the samples, responses were collected from both the primary and secondary respondent, who were adults above the age of 18 years. The primary respondent was typically the male head-of-household and the secondary respondent was typically the first wife. In households where the man or woman was widowed, any other adult significantly involved in farming activities with the smallholder farmer was interviewed. A total of 298 individuals were interviewed.

4.2 Survey design

The study was conducted using a 9-page survey instrument. The survey instrument was divided into 6 main modules. Module A asked demographic question at the household level such as age, sex, marital status, years of marriage, education, religion, total number of persons in the household, number of working adults, number of adults who own farms, number of dependents, number of young children as well as whether any school children in the household benefited from the Ghana school feeding program. Module B asked about the respondent's role in household decision making around production and income generation. Module B was a modified version of the A-WEAI (Abbreviated Women's Empowerment in Agriculture Index) developed in 2012 by the International Food Policy Research Institute, (IFPRI), the Oxford Poverty and Human Development Initiative, and the U.S. Agency for International Development. Module C asked about on the farming activities of the respondent. Module D and E asked about the maize and legume activities, respectively, of the respondent for the past agricultural year, 2016, from planting to harvest. The final module, Module F, incorporates a contingent valuation experiment eliciting respondent's willingness to participate in contract farming with school feeding programs. The hypothetical contract would require the respondent to supply a 100 kg bag of maize or beans at an agreed time period for an agreed price to school caterer.

4.3 Willingness to accept (WTA) experiment

This study is mostly based on the data set from the experiment in module F. The data set captures WTA responses for hypothetical contracts elicited from the respondents using dichotomous choice questions, with 2 follow-up questions. Table 1 below presents the attributes and levels of the hypothetical contracts used in the experiment.

Table 1. *Attributes and Levels of hypothetical contract, survey experiment, Ghana, 2017*

Attributes	Description	Levels
Advance payment	Whether the contract includes an advance payment or not	0%
		50%
Delivery times	Delivery time for product and receiving payment	At harvest
		Before next planting season
Prices	Price of maize	GH¢60/bag
		GH¢80/bag
		GH¢100/bag
		GH¢120/bag
	Price of beans	GH¢280/bag
		GH¢330/bag
		GH¢380/bag
		GH¢400/bag

The respondents are presented with 4 hypothetical contracts for maize and beans, respectively. Figure 2 is a sample maize contract orally administered to the respondents by enumerators. In the first contract, the respondent would receive no advance payment but receives full payment when the bag of crop is delivered, with the delivery time being right at harvest. In the second contract as well, there would be no advance payment to the small holder respondent. They would store the crop, deliver it to the caterer right before the next planting season and receive full payment at delivery of the bag of maize or beans. The third and fourth contracts offer half payment for the crop at the start of the contract and the remaining half payment at the time of delivery of the crop. The third contact requires delivery at harvest time while the forth segment requires storage of the crop for delivery right before the next planting season.

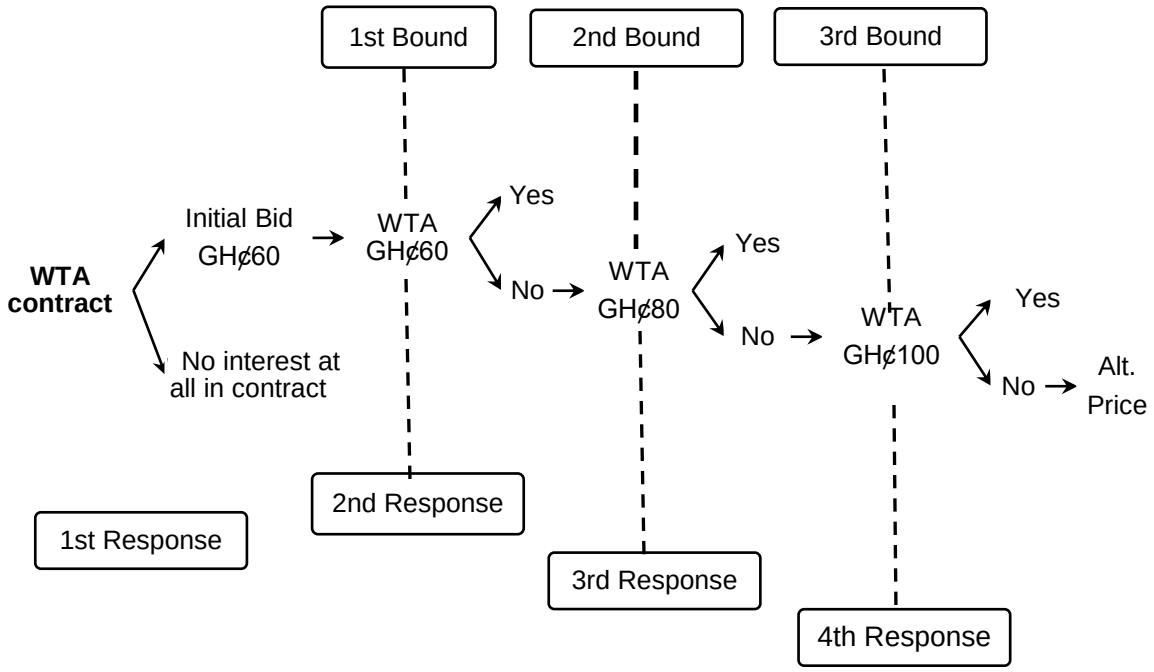
Contract Type	Advance Payment	Delivery Times	Price (GH¢) (ask sequentially)			If no what price will you accept?	No to ALL contracts
Contract 1.A	0%	At harvest	60	80	100		
Contract 2.A	0%	Before next planting	80	100	120		
Contract 3.A	50%	At harvest	60	80	100		
Contract 4.A	50%	Before next planting	80	100	120		

Figure 2. *Sample survey maize contract*

The times of delivery and payment were varied to reflect the times that smallholders sell their crops. Based on the findings of the pre-test instrument, some smallholder farmers sell their crops immediately at harvest if they are cash constrained, while others store the crop and sell when they have large expenditures like payment of school fees or when they need money to invest in farm activities for the next planting season. The prices were also varied for harvest and right before the next planting season to reflect the common trend of prices during these periods.

Recent studies have shown that multilevel (double and triple bounded) choice designs produce statistically more efficient results than conventional dichotomous and discrete choice designs (Kanninen, 1993; Langford, Bateman & Langford, 1996; Bateman, Langford, Jones & Kerr, 2001).). Thus each contract is designed as a triple-bounded dichotomous choice because it's more efficient and gathers more information is from each respondent. This is illustrated in Figure 3 below. The prices are sequentially asked for each contract. A 'yes' was recorded for those smallholders who agreed to the initial amount. Depending on the response to the first amount, two subsequent prices were offered to the smallholder farmers. A higher amount was offered to respondents who refused the first amount. An alternate price was asked of the respondent who refused all three prices given and a 'no' was recorded for farmers who were unwilling to participate in the contract. Thus a minimum willingness to accept was observed on the 4 contracts for each respondent.

Figure 3: *The structure of the contract game used in the survey, Ghana, 2017*



5.0 Preliminary Descriptive Results

Preliminary descriptive statistics at the household and individual levels for the total sample of respondents are presented here. Table 2 below presents household demographics of the surveyed respondents. The respondents had an average of 11 persons per household with an average of 5.7 males and 5.4 females. On average, each household had 0.7 elderly dependents and 4.1 young dependents. Each household also had an average of 2.1 children below the ages of 5 years. The households had an average of 3.2 school children benefitting from an existing free school lunch program in their communities.

Table 2. Household level demographic statistics

Variable	Mean	Std. Dev.	Min	Max
Household size	11.1	5.5	2	30
Males in household	5.7	3.1	1	19
Females in household	5.4	3.3	1	22
Elderly (>65 years)	0.7	0.9	0	3
Male elderly	0.3	0.5	0	2
Female elderly	0.4	0.6	0	2
Children < 18	4.1	2.7	0	15
Males < 18	2.2	1.8	0	11
Females <18	2.0	1.7	0	11
Children <5	2.4	1.9	0	10
Males <5	1.1	1.1	0	5
Females <5	1.3	1.4	0	7
Kids benefit school lunch	3.2	2.7	0	16
Males in school lunch	1.6	1.6	0	8
Females in school lunch	1.6	1.6	0	10

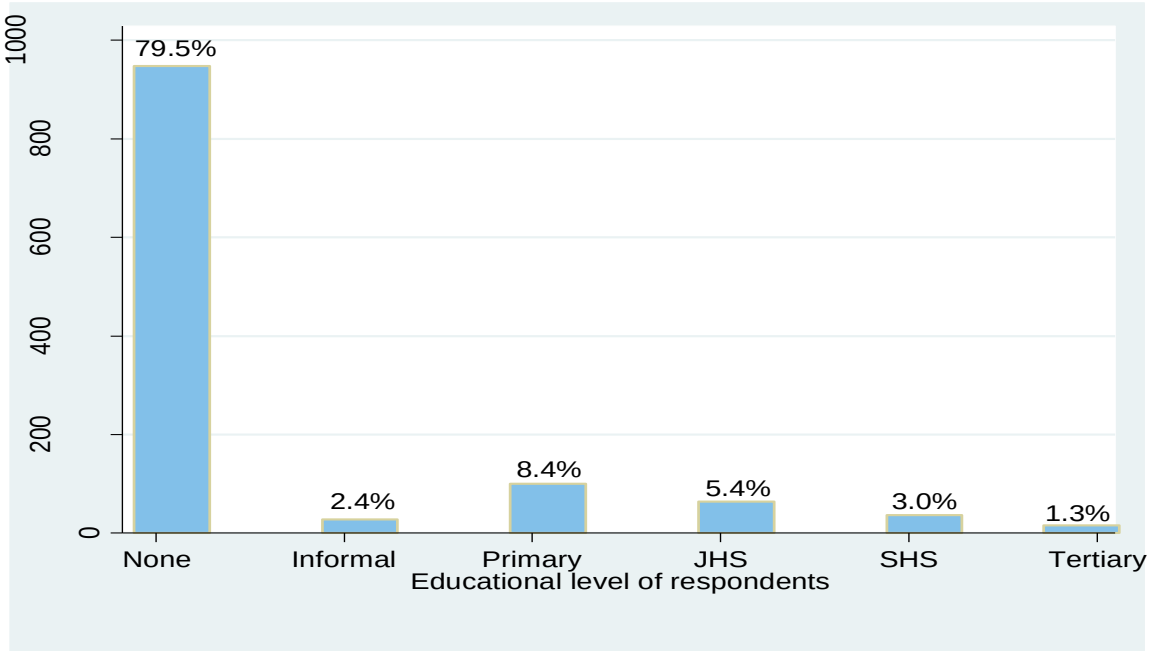


Figure 4. Educational level of respondents

Figure 4 above shows the educational level of the respondents. 79.5% of respondents have no education, 2.4% have some formal education, 8.4% have primary school education and 5.4 % and

4.4% have high school and some tertiary education, respectively. Examining educational level of respondents by gender showed that more women have no education compared to men; 124 women had no education while 100 men respondents had no education; no woman had some informal education while 7 men had some informal education. Additionally, 19 men had more than a primary school education while only 8 women had any education higher than primary. The descriptive statistics show that no woman had tertiary level education while 4 men had received tertiary education.

Table 3. Individual level descriptive statistics by gender

	Female		**Male**	
Variable	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
Age (years)	41.8	13.0	49.6	14.2
Married (yes, no)	1.0	0.2	1.0	0.2
Marriage (years)	21.0	12.5	20.6	12.2
Educated_(yes, no)	0.2	0.4	0.3	0.4
Farm land size (acres)	2.1	1.3	5.6	3.9
Grow maize (yes, no)	0.6	0.5	1.0	0.1
Maize farm size (acres)	0.9	1.0	3.3	2.3
Distance to nearest market (miles)	4.2	4.5	6.6	3.8

Table 3 presents individual level summary statistics of respondents by sex. The average acreage of farm size for male respondents is more than twice the farm land size of women respondents. Women farm on an average of 2.1 acres while males farm on an average land size of 5.6 acres. This farm size includes all crops grown including maize and/or beans. On average, more men own maize farms than women. This phenomenon may be because maize is a staple crop that's consumed almost daily and the man is expected to supply this crop for the household all year through. The average maize farm size of men is also more than twice that of women. Males cultivate an average maize farm size of 3.3 acres while women cultivate an average maize farm size of 0.9 acres. The average distance from respondents' maize farms to the nearest market was about 4.2 miles for women and 6.6 miles for men. This might be because women often cultivate their crops in the backyard of the house while men tend to cultivate their farms farther off from home where they may own or rent larger pieces of land.

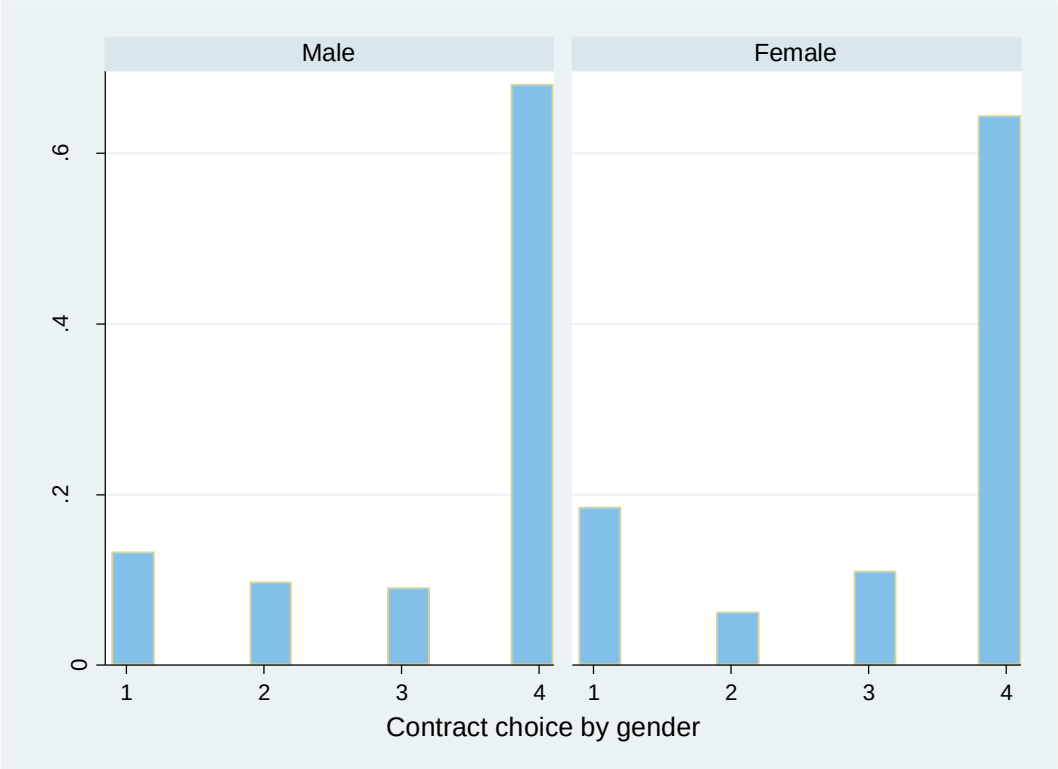


Figure 5. Contract preferences of respondents by gender

Figure 5 above illustrates the 4 contract preferences of the smallholders by gender. Respondents were asked to select their most preferred contract after they had played the dichotomous choice experiment. The question asked was, 'which of the above contracts is your most preferred contract?' These preferences are not based on a single price or the minimum willingness to accept. Rather their preferences are based on their individually accepted prices among the range of prices. Similar to how at a car dealership, different individuals may receive different price quotes for a vehicle and yet prefer one car model over the other. In the graph, we observe is little difference between the contract preferences of men and women smallholder farmers. More than half of the respondents appear to prefer the 4th contract because it includes advance payments as well as the option of supplying the bag of maize right before the next planting season so they can get some money to purchase inputs needed for the planting season. The qualitative responses of the respondents such as 'it will help me purchase inputs like improved seeds and fertilizer for my farm' and 'it will help me to farm well' may indicate the cash flow constraints of the smallholder farmers.

As indicated in Table 1, the farm to school lunch contracts were designed with advance payment, delivery and payment times as well as price attributes. The study seeks to find out whether farmers who receive an initial payment are more willing to participate in the school lunch contract and how this willingness to participate differs between men and women.

In Table 4 below, we observe that there is not much difference in the average prices that men smallholders are willing to accept for the maize contracts with or without advance payments. Women smallholders on the other hand seem to prefer a slightly higher price for contracts with no advance payment compared to contracts that have some advance payment. In other words women farmers may be willing to accept a lower price of GH¢1.3, on average, for contracts that would give them part payment before they cultivate and supply the bag of maize, compared to a contract that provides no initial payments. The preference for higher prices with no advance payments might be an indication that they may be more cash constrained than their male counterparts.

Table 4. Average maize price and advance payment preference by gender

	Summary of price			
	Male		Female	
Advance pay	Mean	Std. Dev.	Mean	Std. Dev.
No	92.0	18.2	94.2	18.1
Yes	92.6	20.4	92.9	20.4

In Table 5 below, we observe that the average price that men smallholders are willing to accept for receiving payment for the bag of maize harvest time is GH¢82 and GH¢102.2 at the start of the next planting season. Similarly women farmers are willing to accept and average of GH¢82.9 at harvest and GH¢104.3 at the start of the next planting season. It would appear that men smallholders are willing to accept an average of GH¢ 19.8 more for delivering the bag of maize at the start of the next planting season rather than at harvest time. Similarly, women smallholders are willing to accept on average GH¢21.4 more at the beginning of the next planting season than the price they are willing to accept for delivery and payments received right at harvest time.

Table 5. Average maize price and delivery preference by gender

	Summary of price			
	Male		Female	
Delivery & payment times	Mean	Std. Dev.	Mean	Std. Dev.
At harvest	82.4	16..3	82.9	16.1
Before next planting	102.2	16.9	104.3	16.1

Beyond the preliminary descriptive results, future analysis will apply econometric models on the triple bounded dichotomous data collected.

6.0 Conclusion and Implications

This paper uses preliminary descriptive statistics to assess the willingness of rural and peri-urban smallholder farmers to engage in school-lunch contract farming. Contract farming could be the institutional arrangement that enables HGSF programs to achieve its win-win goal of strengthening local agrarian economies while providing nutritious meals to school children. These preliminary results might be useful to policymakers as well as international food aid organizations when devising development project for rural and peri-urban smallholder farmers.

The choices of the smallholders may indicate that they are more cash constrained than market constrained. Both men and women smallholders are faced with the cash constraints. However women smallholders may be more constrained as indicated by lower educational levels and lower access to productive resources such as land holdings or maize farm sizes. Additionally, women seem to have a higher willingness to accept for the school lunch contracts that provides no initial payments. They might have to borrow resources to pre-finance the cultivation of high quality maize crop required for the school lunch program, and thus require a premium to payback interest rates. Women smallholders also seem to have a higher willingness to accept for contracts that require them to store the maize crop, deliver and receive payments at the beginning of the next planting season, compared to contracts that provides payment right at harvest.

The cash flow constraints of smallholders might be mitigated with well-designed contracts that increases the utility of both caterers and smallholders, especially the higher constrained women farmers. The caterers can purchase food from the local farmers without additional charges often

added by middlemen or additional transportation costs often incurred when they purchase foodstuffs from the central market and transport to the rural communities. For the smallholder farmers, the contracts may provide an alternative source of livelihood, a primary job or an additional source of income. Women smallholders, as a more vulnerable population and an untapped agricultural resource might gain more from these contracts via increased incomes/wealth that might enable they obtain productive capital necessary to reduce poverty and malnutrition.

The contractual arrangement might increase the production of local foods as well as increase the procurement of local foods from local farmers, thus increasing the use of local food served to school children. Serving food grown locally to school children might provide better nutrition and as fresh local food is more nutritious and wholesome compared to frozen and/or imported foods which might contain preservatives and artificial substitutes. The local food served to school children would also improve child nutrition safety as the food is not processed and stored for long periods, reducing the probability of contamination along long production lines. The nutritious and safe local meals for the school children might also improve the educational outcomes of the school children.

Further research and analysis is needed to substantiate the preliminary findings of this paper.

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