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Contribution of Home Farming on Academic and Career Preferences among Senior High Agriculture Science Students in Sagnarigu Municipal in the Northern Region of Ghana

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Abstract

This research examines home farming experiences of Senior High School (SHS) students and how that influences their academic achievements and career decisions. A cross-sectional survey was adopted for the study. A total of Two Hundred and Fifty-nine students were randomly sampled. A questionnaire and checklist were used for the data collection. Data was analysed using Chi-square tests and logistic regression to establish the significant relationship between home farming and students' decision to study agriculture, academic performance, and career preferences. Access to education was sex-dependent with males having more (66.8%) access. A majority (63.7%) of the respondents grew up in rural areas. A majority of respondents engaged in home farming. Students' Parents' occupations significantly influenced their involvement in home farming. Greater proportion (90.3%) of the students deliberately choice to study agriculture at the SHS level. Engagement in home farming has a significant effect on student's decision to study Agriculture Science, thus rejecting the null hypothesis (H01). This suggests that home farming has a strong, positive influence on the decision to study Agriculture. Students who did not engage in home farming are about 7.4 times more likely to be undecided about their future careers in Agriculture. Home farming did not significantly influence the actual academic performance of respondents. It was therefore concluded that students who engaged in home farming were more likely to choose agriculture science as a course of study. The study then recommends that early exposure to home farming should be encouraged at the basic education level.

Keywords
Academic Performance, Career Preference, Home Farming, Sagnerigu

1. Introduction

At the tertiary level, Results in West Africa Examination grades in Agriculture Science serve as a pre-requisite for enrolling in disciplines like Agriculture Education, Agriculture Engineering, Agriculture Technology, Animal Production, Fishery, Forestry, and Veterinary Nursing. As such Agriculture Science was included in the curriculum content of Senior High Schools after the realization of its educational value and its relevance to the needs of the individual learner and society as a whole (Lawankar, Shelar, Pote, 2023). Kakumbi, Samuel, and Mulendema (2016) posited that students' home background and practical farm experiences are the major factors that influence learning because different home background characteristics of students exert a greater influence on what they can learn and retain. Makabori (2019) researched students of Manokwari Polytechnic and found out that the younger generation's loss of interest in agricultural careers was due to factors such as the lack of external support and unstable agricultural market conditions. These factors also shaped the agricultural students' perception of working outside the agricultural sector.

Fischer & Burton (2014) however observed that, when children participate in household, farm, and off-farm activities, it allows them to acquire the knowledge and skills needed to succeed as farmers or in other agricultural-related careers in the future. Experiential learning through activities like home farming has a variety of dimensions such as abstract conceptualization, active experimentation, concrete experience, observational learning, real

experience, reflective thinking, and teacher-as-facilitator. However, the fact that children are sometimes dragged unwillingly to farms either at home or at school as a form of punishment ends up cultivating within these children the development of very negative perceptions of agriculture, preventing them from viewing it as an enjoyable activity and a profitable career (Sabates-Wheeler & Sumberg, 2020; Lachowki, Lachowska, 2007; Nooroge, 2022). It is, therefore, very problematic that students who participate in agriculture in school tend to view it only as a subject and engage in it mainly to pass their examinations but not to build a future out of it (*Afryie et al*., 2023). What is even more tragic is that a majority of the few who brave all odds and decide to major in disciplines related to agriculture still fail to pursue careers in primary agricultural production and transformation (Obayelu & Fadele, 2019). These graduates mostly opt for out-of-farm professions in the sector, like consultancy, extension, marketing, and teaching (Obayelu & Fadele, 2019). Students' involvement in home farming is mostly influenced by the availability of agricultural activity taking place at home which offers them the opportunity to participate (Moitui, 2019).

However, what students learn at school is sometimes hindered from being put into practice at home since students have no right to introduce it simply because parents claim they know how particular activities are done based on their farming experiences (Magagula & Tsvakirai, 2020). Agriculture in its current state seems unappealing and most youths are running away from agricultural careers or rural futures (Moitui, 2019). The disparaging of farming and rural life, together with the absence of role models for young farmers, appear among the possible reasons for Ghanaian youths, including students in the Sagnarigu Municipality increasing resistance to pursuing agriculture-based livelihoods. It is unfortunate that this situation further discourages high school students offered the Agriculture Science programme from considering career prospects in agriculture (*Afryie* et al., 2023). Considering the scanty job opportunities, unstable and very low remuneration, as well as severe working conditions, it is not very surprising that most youth seldom consider farming to be a "good job" (Mkong et al., 2021: Sumberg, 2021). In the West African Examinations Council (WAEC) chief examiners' report, it was indicated that most candidates lost marks because they had no exposure to agricultural experiences in fishery, forestry, poultry management, arable crop production, plantation farming, among others (Abimbola & Balschweid, 2013). Croom and Flowers (2001) however, stated that practical works remain indispensable in the teaching and learning of agriculture. It is in the light of all these above-mentioned difficulties that this research is perceived, which is aimed at assessing and documenting the special role of home farming on the academic achievement and career preferences of SHS students studying Agriculture Science. The findings of this study anticipated to create awareness and insight about home farming as well as how the experience could impact students' decision to study agriculture and its subsequent impact on their academic achievements. Specifically, the research intended to:

1. Determine the influence of home farming experiences on students' decision to study Agriculture Science at the Senior High School.
2. Examine the effect of home farming experiences on students' academic performance in Sagnarigu Municipal.
3. Investigate the effect of home farming on students' career preferences in agriculture.

Hypotheses of the Study:

The following null hypotheses were tested:

H_{01}: Home farming experiences have no significant effect on students' decision to study Agriculture Science at the Senior High School.

H_{02}: Home farming experiences have no significant effect on students' academic performance in Agriculture Science.

H_{03}: Home farming experiences have no significant effect on students' career preferences in agriculture.

1.1 Conceptual Framework

The conceptual framework is presented in Figure 1. In this study, the independent variable is the student's home background. The dependent variables are choice of agriculture science, academic performance, and career preferences of SHS Agriculture Science students while the moderating/intervening variable is home farming. Students' home background (parents' age, gender, education, employment/career status, and locality i.e., rural or urban) are the perceived elements most likely to influence students' participation in home farming as well as the type of home farming and agricultural practices they are likely to be exposed to. That is: whether they will be involved in animal or crop farming; whether it will be on a commercial or subsistence basis; the quality and quantity of farm yield; the type of cultural practices they will engage in; the type of farm machinery they use; the agricultural professionals they meet, among other experiences, will rely on their socio-demographic characteristics of their parents. According to Afriyie et al. (2023), these factors greatly affect students' views, perceptions, and willingness to study Agriculture Science. Through these agricultural experiences, home farming will diversify students' perceptions of agriculture and influence their willingness to pursue Agriculture Science in Senior High School. Modification of students' perceptions and willingness to pursue Agriculture Science as a result of home farming will influence their decision to choose agriculture science, and affect their academic performance as well as their preference for careers in agriculture. An

overall consequence will be an effect on; student enrolment in Agriculture Science; human resources in agricultural-related professions; advancement of agriculture-based innovations; food production; food security; employment opportunities in agriculture; and, income generated from agriculture.

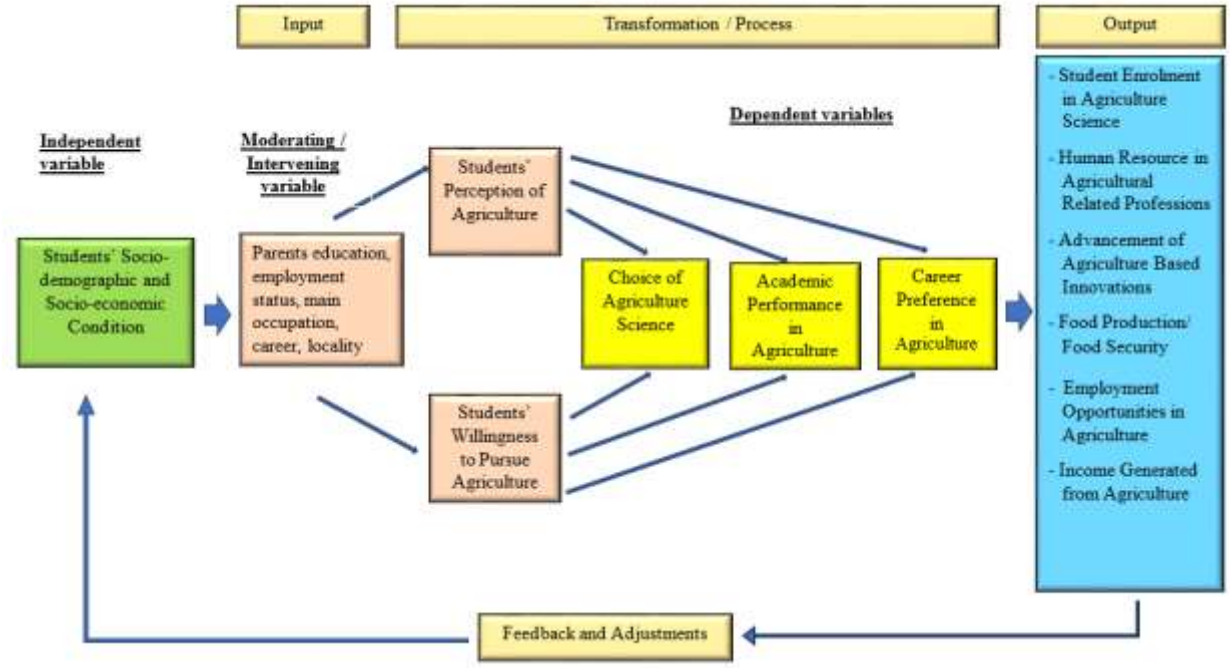

Figure 1. Conceptual Framework

2. Materials and Methods

This session presents information on the study area, research design, target population, sampling procedure, sample frame and sample size determination, sources of data collection, data analysis, and ethical considerations.

2.1 Study Area

The research was conducted in the Sagnarigu Municipal. The Sagnarigu Municipal is among six (6) districts created early in 2012 in the then Northern Region (GSS, 2005). The Sagnarigu Municipal has Sagnarigu as its capital and covers 200.4 km² of land size with 79 communities. It is made up of 20 urban, 6 sub-urban, and 53 rural areas (GSS, 2005). It shares boundaries with Tamale Metropolis, Savelugu-Nanton Municipality, Tolon District and Kumbungu District. Geographically, the Municipality lies between latitudes 9º16' and 9º 34' North and longitudes 0º 36' and 0º 57' West (GSS, 2005). Many schools are situated in the district namely the City Campus of the University for Development Studies; Tamale Technical University; Tamale Teachers Training College; and Bagabaga Teachers Training College all of which are tertiary schools located in the district. The Pre-tertiary schools include Tamale Senior High School (TAMASCO); Kalpohini Senior High School (KASS); the Northern School of Business (NOBISCO); Islamic Science Senior High School; Business College International (BCI) among several other schools. The Sagnarigu District like many others in the Northern Region has a single rainy season, usually stretching from May to October, and this period naturally coincides with the farming activities in the district. Annual rainfall average ranges from 600mm to 1100mm, the peak is usually between July and August. Daily temperatures vary from season to season. During the rainy season, there is high humidity with relatively less sunshine and heavy thunderstorms. The mean day temperatures range from 28ºC (December -mid-April) to about 38ºC (April -June) while the mean night temperatures range from 18ºC (December) to 25ºC (February, March). The dry season (November –March) is characterized by the dry Harmattan winds; the Harmattan season presents two extreme weather conditions, the extreme dry cold temperature of the early dawns and mornings and the very warm afternoons.

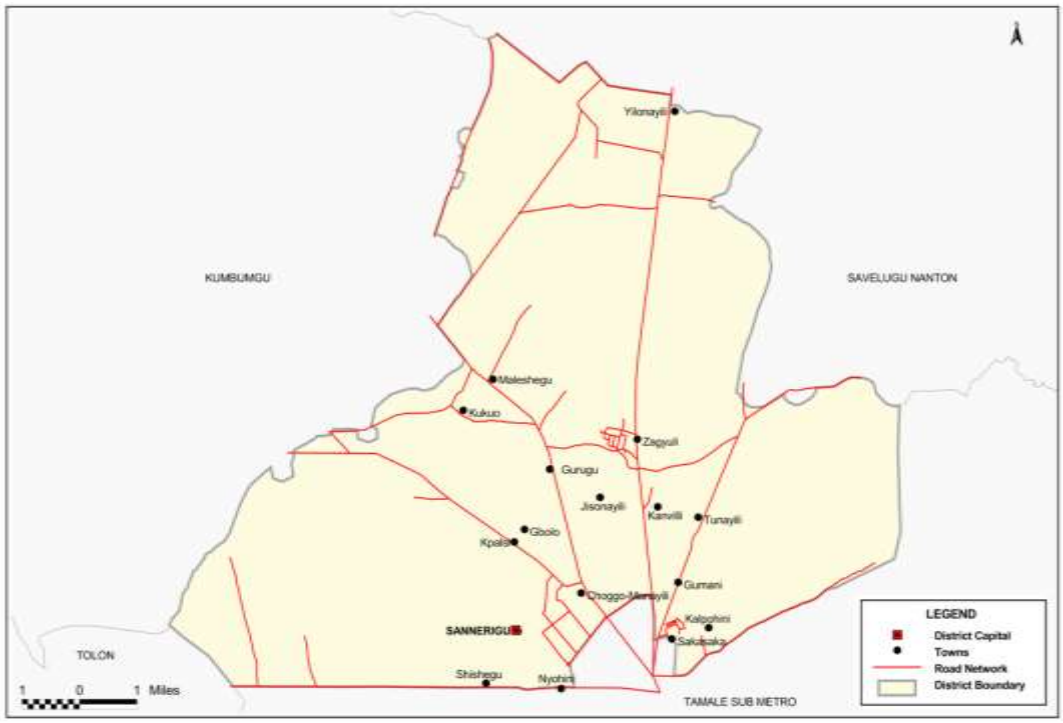

Figure 2. Map of Sagnarigu Municipal

2.2 Study Design

A cross-sectional survey was adopted for the study. A cross-sectional study is a type of research design in which the researcher can collect data from many different individuals at a single point in time (Schmidt & Brown, 2019). The purpose is to examine the effect of home farming experiences on students' academic performance and career decisions within the Sagnarigu Municipal. Cross-sectional studies often utilize questionnaires to gather data from participants. Cross-sectional research design allows one to observe and study the relationship between variables without influencing them (Lauren, 2020).

2.3 Sampling Procedure and Techniques

A purposive sampling technique was used to sample three (3) schools offering Agriculture programmes. Simple random sampling was then used to select the respondents from the three (3) schools. This was to grant each member of the population equal opportunity to be chosen as part of the study sample (Singh, 2003). One student was chosen randomly in the class using the register, thereafter, every third student from the first chosen student in the class register was then selected till the sample size was achieved. This procedure was repeated in each selected school.

2.4 Sample Frame

Table 1 presents the sample frame of Seven Hundred and Ninety-six (796) students obtained from a recognizance survey in the three study schools.

Table 1. Sample Frame and Size of Three Schools

School	Frame	Size
Tamale Islamic Science SHS	439	143
Tamale SHS	185	60
Kalpohini SHS	172	56
Total	796	259

Source: Field Survey, 2024

2.5 Sample Size Determination

The mathematical formula by Adam (2020) was used in calculating the sample size.

That is: $$n=\frac{x^2NP(1-P)}{d^2(N-1)+x^2P(1-P)} \quad (1)$$

Where: 'n' is the sample size, 'x' is the table value of chi-square at 0.05 which is 3.84, 'N' is the population size (796 students), 'P' is the expected proportion of the population accessible = 50% (0.5), and 'd' is the margin of error which in this case is (0.05).

$N = \frac{3.84 \times 796 \times 0.5 \times (1-0.5)}{0.05^2 \times (796-1) + 3.84 \times 0.5(1-0.5)} = \frac{764.16}{2.9475} = 259.257$

n = 259 students

Using the formula propounded by Adam (2020), the sample size arrived at was 259 students.

The sample size of Two Hundred and Fifty-nine (259) was then distributed among the schools by simple proportion (i.e., dividing each school's population by the total population (796) and multiplying by the sample size (259) to get each school's sample size as presented in Table 1.

2.6 Data Collection Procedure

Copies of the questionnaire were administered to students in their respective schools. students were given ample time to respond to the questionnaire. Completed copies of the questionnaire were collected on the same day. Focus Group Discussions were also held with students of the selected schools to validate responses provided in the questionnaire.

2.7 Data Analysis

The analysis of this study was conducted using descriptive and rigorous statistical methods. The study employed descriptive statistics to better understand the data and to determine the percentages of different demographic groups represented in our findings. Specifically, these statistics provided insights into the backgrounds and experiences of the students and also their involvement in farming.

We employed a chi-square test to investigate the effects of home farming on students' decisions to study at the university and assess its impact on student's academic performance. By using the chi-square test, we were able to identify whether any differences between the observed and expected data were due to chance. Additionally, we also measured the effect of home farming on student farming using a chi-square test.

The Chi-square model is presented as:

$$\chi^2 = \sum_{i=1}^{r}\sum_{j=1}^{c} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \qquad (2)$$

χ^2 represent the Chi-square test of independence, O_{ij} represents observed frequency while E_{ij} refers to expected frequency. However, degree of freedom is given by df = (r-1) (c-1), where r is the number of rows and c, the number of columns.

Where $E_{i.j}$ is computed as:

$$E_{i.j} = \frac{\sum_{k=1}^{c} O_{ik} \sum_{k=1}^{r} O_{kj}}{N} \qquad (3)$$

Where $E_{i.j}$ = expected value, $\sum_{k=1}^{c} O_{ik}$ = sum of observed frequencies in the i_{th} column and $\sum_{k=1}^{r} O_{kj}$ = sum of the observed frequencies in the j_{th} row and N= total number of observations.

Next, we compared the value of the calculated Chi-square with the critical value from the Chi-square distribution table. The critical value is determined based on a pre-determined level of significance (typically 5%) and the degrees of freedom (df). The hypothesis will then be rejected if the calculated Ch-square value exceeds the critical value at the chosen level of significance. On the other hand, if the calculated Chi-square is less than the critical value, we fail to reject the null hypothesis, suggesting that the variables are independent.

Following this, we applied a logistic regression model to analyze the relationship between the factors influencing students' decisions to study agriculture, specifically related to their experiences with home farming.

The logistic function is defined as:

$$P(Y = 1 \mid X) = \frac{1}{e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots + \beta_K X_K)}} \qquad (4)$$

Where:

P (Y =1| X) is the probability that the dependent variable Y equals 1 given the independent variable X.

β0 is the intercept.

$\beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots + \beta_K X_K$ are the coefficients of the predictor variables

$X_1 + X_2 + \ldots + X_K$ are the independent variables

e is the base of the natural logarithm.

The odds can also be expressed as:

$$Odds(P) = \frac{P(Y = 1 \mid X)}{(1 - P(Y = 1 \mid X))} \qquad (5)$$

The log-odds (or logit) is:

$$logit(P) = log\left(\frac{P(Y = 1 \mid X)}{1 - P(Y = 1 \mid X)}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots + \beta_K X_K$$

This equation allows for the interpretation of the relationship between the predictor variables and the log odds of the probability of the outcome occurring.

3. Results and Discussion

This section of the study presents the findings from the data collected from the field. The results are presented based on the objectives and hypotheses stated for this study. The significance of factors is considered for those with a p-value less than 0.05.

3.1 Socio-demographic Characteristics of Respondents

The socio-demographic characteristics of the respondents reveal several key insights shown in Table 2. A majority (66.8%) of the students were male, with females making up only 33.2% of the sampled population. This may suggest that access to SHS education in the Sagnarigu Municipality is sex-dependent with males having more access than females. This finding agrees with *Baba et al. (2022)* who affirmed in a study conducted in the Sagnarigu-Dungu Community in Tamale observed that parents and guardians would prefer to send boys to school with the mindset that the girl child will one day get married and go away from the father's house. This family preference tends to favour males over females. Most (59.1%) of the respondents are between the ages of 17-18, typical for Senior High School students, with a significant number (32.4%) being over 18 years, potentially due to delays in schooling. In terms of living arrangements, 71.8% live with both parents, suggesting a stable home environment, while others live with either one parent or extended family members.

When it comes to parental education, a proportion (43.4%) of fathers had no formal education, while 21.7% had tertiary education, which could affect their support for educational pursuits. The educational levels of mothers are even lower, with 61.2% having no formal education. The employment status of parents shows that most (77.5%) fathers and (89.2%) of mothers were self-employed, particularly in informal sectors. A significant portion (58.8%) of fathers were engaged in farming, whereas most (63.2%) mothers were traders. The respondents come from predominantly large households, with 42.5% having 10 or more members whilst only a smaller (7.7%) representation came from smaller households with at most three (3) members. In Ghana, a larger household implies that more income is needed to provide the necessities of life for improved livelihoods (Arasi et al., 2021; Asravor, 2017). This implies that parents may involve themselves in other minor occupations such as backyard gardens or home farming.

3.2 Respondents' Involvement in Home Farming

The results in Table 3 highlight the respondents' involvement in home farming and provide insights into their background and experiences. A significant portion (63.7%) of the respondents grew up in rural areas, while the remaining (36.3%) were raised in urban settings. Respondents were further asked if they engaged in home farming and were to indicate further who introduced them. An overwhelming (87.2%) of respondents indicated they were engaged in home farming, reflecting a high level of participation in agricultural activities at home, with only (12.8%) not involved. Among those involved in farming, the majority (74.0%) were introduced to it by their parents, showing that farming knowledge and practices are largely passed down within the family. A smaller percentage (9.9%) were introduced to farming by themselves, with family relatives being (8.3%), and those introduced by neighbors constituting (5.0%). This finding agrees with Moitui (2019) who stated that students' involvement in home farming is mostly influenced by the availability of agricultural activity at home which offers them the opportunity to participate. It is worth noting that most of these students were introduced to home farming by their parents because children who engaged in and supported family businesses increased their self-esteem and social security (Lobley et al., 2010). Regarding frequency, about half (50.8%) of the respondents reported being engaged in home farming sometimes while 24.0% engage in it all the time and 11.6% are very often engaged. A smaller proportion (13.6%) rarely participated in home farming activities. Regarding the scale of farming, most respondents (50.8%) reported practicing farming at a medium scale, while 38.8% engaged in subsistence farming, and only 10.3% were involved in large-scale farming. According to Afriyie et al. (2023), students' interest in Agriculture Science depends largely on their perception of agriculture. Most (50.8%) of the respondents' engagement in medium-scale home farming may with time boost their interest in going into commercial production beyond the medium-to-subsistence levels in the future. This will in turn positively impact on food security not only for the Sagnarigu Municipal but also in the country as a whole since Béné et al. (2015) reported that about 70% more food will be required to feed the ever-increasing world population by 2050. Finally, regarding the number of years respondents have spent engaging in home farming varies, with 34.7% reporting 1-3 years of experience, 21.1% having 7-9 years, and 25.6% having 10 or more years.

Table 2. Socio-Demographic Characteristics of Respondents

Variable	Frequency	Percentage
Gender		
Male	173	66.8
Female	86	33.2
Age		
Below 15	2	0.8
15-16	20	7.7
17-18	153	59.1
Above 18	84	32.4
Person staying with		
Alone	1	0.4
Both parents	186	71.8
Only father	13	5.0
Only mother	32	12.4
Other family relations	25	9.7
Non-family member	2	0.8
Educational level of father		
Basic	46	17.8
Secondary	44	17.1
Tertiary	56	21.7
No formal education	112	43.4
Educational level of mother		
Basic	55	21.3
Secondary	23	8.9
Tertiary	22	8.5
No formal education	158	61.2
Employment status of father		
Self employed	200	77.5
Formally employed	50	19.4
Unemployed	8	3.1
Employment status of mother		
Self employed	231	89.2
Formally employed	19	7.3
Unemployed	9	3.5
Main Occupation of father		
Farmer	151	58.8
Teacher	21	8.2
Trader	46	17.9
Others	39	15.2
Main Occupation of mother		
Farmer	69	26.7
Teacher	10	3.9
Trader	163	63.2
Others	16	6.2
Household size		
1-3	20	7.7
4-6	69	26.6
7-9	60	23.2
10 and above	110	42.5

Source: Field Survey, 2024

Table 3. Involvement in Home Farming

Variable	Frequency	Percentage
Place grew up		
Rural area	165	63.7
Urban area	94	36.3
Engagement in home farming		
Yes	225	87.2
No	33	12.8
Who introduce to home farming		
Self	24	9.9
Parents	179	74.0
Family relative	20	8.3
Neighbour	12	5.0
Others	7	2.9
Frequency of engaging in home farming		
Always	58	24.0
Very often	28	11.6
Sometimes	123	50.8
Rarely	33	13.6
Scale of farming		
Large	25	10.3
Medium	123	50.8
Subsistence	94	38.8
Years in home farming		
1-3	84	34.7
4-6	45	18.6
7-9	51	21.1
10 and more	62	25.6

Source: Field Survey, 2024

3.3 Effects of Home Farming on Student's Decision to Study Agriculture Science at SHS

Table 4 presents the relationship between students' engagement in home farming and their decision to study Agriculture Science at Senior High School (SHS). From the descriptive statistics in Table 4, of the students who decided to study Agriculture Science at SHS, an overwhelming majority (92.9%) had engaged in home farming, while only 7.1% of these students had not been involved in home farming. In contrast, among those who did not choose to study Agriculture Science, 69.4% had participated in home farming, and a higher proportion (30.6%) had not. A Chi-square test was further conducted to test the null hypothesis that:

Ho: Home Farming Experiences have no Significant Effect on Students' Decision to Study Agriculture Science at Senior High School.

The results show a significant association between the two variables. Evidence from the Chi-square analysis (Table 4), indicates a statistically significant relationship between home farming experiences and students' decisions to pursue Agriculture Science ($X^2 = 23.323$, $P < 0.001$). This means that engagement in home farming has a significant effect on the student's decision to study Agriculture Science at SHS, thus rejecting the null hypothesis ($H0_1$), which stated that home farming experiences have no significant effect on this decision. These findings suggest that exposure to home farming greatly influences students' academic choices, with those involved in home farming being far more likely to pursue agriculture studies in high school than those without such experiences.

Table 4. Effects of Home Farming on Student's Decision to Study Agriculture Science at SHS

Decision to study agriculture science at SHS	Engagement in home farming		Chi-Square	p-value
	Yes n(%)	No n (%)		
Yes	182(92.9)	14(7.1)	23.323	<0.001
No	43(69.4)	19(30.6)		

Source: Field Survey, 2024

3.4 Influence of Home Farming on Student's Decision to Study Agriculture Science at SHS

Table 5 presents the results of a logistic regression analysis examining the influence of home farming on students' decisions to study Agriculture Science at Senior High School (SHS). The odds ratio for students who did not engage in home farming is 5.744[95% CI=2.670-12.359], meaning they are approximately 5.7 times more likely not to choose Agriculture Science at SHS compared to those who were involved in home farming. The p-value is less than 0.001, showing that this relationship is statistically significant. This suggests that home farming has a strong, positive influence on the decision to study Agriculture Science, as students without home farming experiences are significantly more likely to opt out of studying the subject at SHS.

Table 5. Influence of Home Farming on Student's Decision to Study Agriculture Science at SHS

Decision to study agriculture science at SHS	Engagement in home farming			
	Odds	95% C.I.		p-value
		Lower	Upper	
Yes	5.744	2.670	12.359	<0.001
No				

Source: Field Survey, 2024

This finding is in harmony with Esters & Bowen (2005) who asserted that prior experience in Agriculture is the most influencing factor on students' choice of a major in agriculture.

When students were asked during a Focus Group Discussion to indicate how home farming influenced their decision to study Agriculture Science at the SHS level. A respondent said:

"…Knowledge transfer from home farming helped me pass school examinations and develop a positive attitude towards agriculture. It allowed me to equip myself with knowledge which I sometimes use to help my parents improve their local farming methods".

These reasons correspond with what Afriyie et al. (2023) posited that students' interest in agriculture depends on how they perceive it. Therefore, frequent engagement in home farming activities may tend to drive the students to seek more knowledge about it as seen in their responses. Dlamini (2017) investigated the exerting influence of a group of factors on students' choice to pursue a major in agriculture and identified "Exposure to agriculture" as the most influencing factor. Obayelu & Fadele (2019) pointed out that, the perception and attitude of the youth toward agriculture is a major influencer of their volition to pursue Agriculture Science in quest of a higher degree. However, their perception and attitudes are largely influenced by environmental and individual socioeconomic factors (Njeru, 2017) like home farming experiences. It is therefore not very surprising that most of the students' decision to study Agriculture Science was influenced by their home farming experiences.

3.5 Effects of Home Farming on Student's Academic Performance

This section examines the effects of home farming on students' academic performance, specifically BECE grades, SHS performance, and the perceived contribution of home farming to academic outcomes. For BECE grades, the results (Chi-Square = 2.468, $p = 0.481$) suggest no statistically significant association between engagement in home farming and BECE performance. The percentages of students across the grade ranges (6-13, 14-21, 22-29, and 30 and above) are similar, whether or not they engaged in home farming. Therefore, the null hypothesis (H2), which states that home farming experiences have no significant effect on students' academic performance, fails to be rejected for BECE grades.

Similarly, for performance at SHS, the results (Chi-Square = 2.849, $p = 0.241$) show no significant relationship between home farming engagement and SHS performance. Students who performed excellently, above average, or average at SHS did not differ significantly based on whether they had home farming experiences. Hence, the null hypothesis (H2) also fails to be rejected about SHS performance. However, the analysis of the contribution of home farming to academic performance yields a statistically significant result (Chi-Square = 24.743, $p < 0.001$). A large majority (91.7%) of students who believed home farming positively contributed to their academic performance had engaged in home farming, compared to only 8.3% who had not. In contrast, 36.6% of those who did not think home farming contributed to their academic success had not engaged in it. This indicates that students who engage in home farming are significantly more likely to perceive it as beneficial to their academic achievements. Thus, in terms of students' perception of home farming's contribution to academic performance, the null hypothesis (H02) is rejected. Which is:

H02: Home farming experiences have no significant effect on students' Academic performance in Agriculture Science.

Table 6. Effects of Home Farming on Student's Academic Performance

Variable	Engagement in home farming		Chi-Square	p-value
	Yes n(%)	No n(%)		
BECE Grade			2.468	0.481
6-13	34(82.9)	7(17.1)		
14-21	98(86.7)	15(13.3)		
22-29	80(90.9)	8(9.1)		
30 and above	12(80.0)	3(20.0)		
Performance at SHS			2.849	0.241
Excellent	89(83.2)	18(16.8)		
Above Average	82(89.1)	10(10.9)		
Average	54(91.5)	5(8.5)		
Contribution of home farming to academic performance			24.743	<0.001
Yes	199(91.7)	18(8.3)		
No	26(63.4)	15(36.6)		

Source: Field Survey, 2024

In summary, the hypothesis that home farming experiences do not significantly affect students' academic performance fails to be rejected based on actual BECE and SHS performance. However, the hypothesis is rejected when considering students' perceptions of how home farming contributes to their academic success. Okiror et al. (2011) posited that the methods and approaches adopted in presenting agricultural lessons to students can greatly influence the student's attitude toward their learning.

3.6 Effects of Home Farming on Student's Academic Performance

Table 7 presents the results of a logistic regression analysis assessing the impact of home farming on students' academic performance, specifically focusing on BECE grades, SHS performance, and the perceived contribution of home farming to academic outcomes. For BECE grades, the odds ratios for the grades range 14-21, 22-29, and 30 and above, when compared to the reference group (6-13), show no statistically significant impact of home farming on students' BECE performance. The p-values for each grade range (14-21: $p = 0.865$, 22-29: $p = 0.252$, and 30 and above $p = 0.682$) indicate that the differences are not statistically significant. Therefore, the odds of obtaining higher BECE grades (6-13) are not significantly influenced by home farming engagement.

Similarly, for performance at SHS, students who performed above average (OR = 0.481, $p = 0.118$) and average (OR = 0.334, $p = 0.064$) compared to those who performed excellent do not show significant differences related to home farming. Although the odds ratios suggest that students engaged in home farming might be less likely to perform at average or above average levels than those who perform excellently, these results are not statistically significant, as both p-values are above the 0.05 threshold. However, the perceived contribution of home farming to academic performance reveals a highly significant result. Students who do not believe home farming contributed to their academic performance are 8.035 times more likely to hold this view than those who believe it did (95% C.I. = 3.407 to 18.948, $p<0.001$). This shows a strong association between engagement in home farming and the perception that it positively impacts academic performance.

In summary, home farming does not significantly influence actual academic performance (as measured by BECE grades and SHS performance) since the p-values for these variables are not significant. However, home farming significantly impacts students' perception of its contribution to their academic success, with those engaged in home farming much more likely to view it as beneficial.

When respondents were asked during FGD to mention some of the positive and negative effects of home farming on their academic performance. The positive effects they mentioned were that:

Home farming helped them acquire a better understanding of concepts and this helped them pass their examinations; proceeds from farm they said was sold to pay their fees, buy books and pay for their extra classes.

Table 7. Impact of Home Farming on Student's Academic Performance

Variable	Engagement in home farming			
	Odds	95% C.I.		
		Lower	Upper	p-value
BECE grade				
6-13	*Ref*			
14-21	.911	.311	2.666	.865
22-29	.498	.151	1.643	.252
30 and above	1.418	.267	7.535	.682
Performance at SHS				
Excellent	*Ref*			
Above Average	.481	.193	1.203	.118
Average	.334	.105	1.065	.064
Contribution of home farming to academic performance				
Yes	*Ref*			
No	8.035	3.407	18.948	< 0.001

Source: Field Survey, 2024

The negative effects identified included: Tiredness from home farming they said made it difficult for them to study at night; they tend to miss school because of home farming activities during the time of harvesting when they had to help parents on their farms. The research on the negative effects of home farming supports Antwi (2023) and Sabates-Wheeler & Sumberg (2020) who indicated that the act of dragging children unwillingly to farms either at home or at school as a form of punishment ends up cultivating within these children, the development of very negative perceptions of agriculture, preventing them from viewing it as an enjoyable activity and a profitable career. This shows that a balance should be found between students' involvement in home farming and their academic work so that they are not exhausted by home farming activities to the detriment of their academic work. This should be considered a priority by all stakeholders of Agriculture Science education because it can result in the development of negative perceptions and attitudes towards agriculture and consequently lead to a decline in enrolment as well as the academic achievement and career preferences of these students in Agriculture Science.

3.7 Effect of Home Farming on Student's Career Preference

Table 8 evaluates the effect of home farming on students' career preferences, focusing on their future career decisions, preferred mode of employment, and plans to engage in home farming in the future. This is tested under the third hypothesis (H03) as:

H03: Home farming experiences have no significant effect on students' career preferences in agriculture.

For decisions on future careers, there is a significant relationship between engagement in home farming and students' career preferences. Among those who have decided on a future career, 93.1% had engaged in home farming, compared to only 6.9% who had not. In contrast, among those who were undecided about their future career, 64.8% had engaged in home farming, and a higher proportion (35.2%) had not. The results (Chi-Square = 30.705, $p < 0.001$) indicate a statistically significant effect of home farming on career preferences, suggesting that students involved in home farming are more likely to have a defined career path. Therefore, the null hypothesis (H03), which posits that home farming has no significant effect on career preferences, is rejected for future career decisions.

For the preferred mode of employment, no statistically significant relationship is found between home farming engagement and students' employment preferences (self-employment, government, NGO, or partnership). The results (Chi-Square = 4.084, $p=0.253$) indicate that students' preferences for their future mode of employment are not significantly affected by their engagement in home farming. As a result, the null hypothesis (H3) fails to be rejected for mode of employment.

Regarding plans to engage in home farming in the future, the results (Chi-Square = 2.239, $p=0.326$) indicate no significant relationship between past engagement in home farming and students' intentions to engage in farming in the future. Whether students plan to engage in home farming, do not plan to, or are undecided, their previous home farming experiences do not significantly influence these intentions. Thus, the null hypothesis (H03) fails to be rejected for future home farming plans.

Table 8. Effect of Home Farming on Student's Career Preference

Variable	Engagement in home farming			
	Yes n(%)	No n(%)	Chi-Square	p-value
Decision of future career			30.705	<0.001
Yes	190(93.1)	14(6.9)		
No	35(64.8)	19(35.2)		
Prefer mode of employment			4.084	0.253
Self	59(92.2)	5(7.8)		
Government	103(88.0)	14(12.0)		
NGO	49(80.3)	12(19.7)		
Partnership	14(87.5)	2(12.5)		
Planning to engage in home farming in the future			2.239	0.326
Yes	176(86.7)	27(13.3)		
No	32(94.1)	2(5.9)		
Undecided	17(81.0)	4(19.0)		

Source: Field Survey, 2024

3.8 Influence of Home Farming on Student's Career Preference

Table 9 presents the results of a logistic regression analysis that examines the influence of home farming on students' decisions regarding their future careers. The odds ratio for students who have not engaged in home farming is 7.445[95% CI=3.336-16.613], meaning they are about 7.4 times more likely to be undecided about their future careers compared to those who have engaged in home farming. The p-value is less than 0.001, which confirms that the relationship is statistically significant. This result suggests that students who participated in home farming are significantly more likely to have a clear decision about their future career, whereas those who have not engaged in home farming are much more likely to be uncertain about their career paths. From the findings of the study, the null hypothesis states that:

"Home farming experiences have no significant effect on students career preferences in agriculture" has been rejected since home farming was found to significantly influence the career choices of students.

Table 9. Influence of Home Farming on Student's Career Preference

Decision of future career	Engagement in home farming			
	Odds	95% C.I.		p-value
		Lower	Upper	
Yes	*Ref*			<0.001
No	7.445	3.336	16.613	

Source: Field Survey, 2024

This finding agrees with Fischer & Burton (2014) who observed that, when children participate in household, farm, and off-farm activities, it allows them to acquire the knowledge and skills needed to succeed as farmers or in other agricultural-related careers in the future.

4. Conclusion and Recommendations

The studies concluded that:

1. An overwhelming number of respondents indicated they were engaged in home farming, reflecting a high level of participation in agricultural activities at home, with a few of them not involved.
2. Secondly, the majority of them were introduced to home farming by their parents, showing that farming knowledge and practices are largely passed down within the family.
3. Home farming has a strong, positive influence on the decision to study Agriculture Science, as students without home farming experiences are significantly more likely to opt out of studying the subject at SHS. This is an indication that hands-on farming activities at home are a key factor in determining students' choice of Agriculture Science as a course of study at the SHS level in the future.
4. The results indicated further that, home farming does not significantly influence actual academic performance (as measured by BECE grades and SHS performance) however, home farming has a significant impact on students' perception of its contribution to their academic success, with those engaged in home farming much more likely to view it as beneficial.

Recommendations:

The following recommendations can be drawn from the study:

1. Schools should formally integrate home farming activities into the agriculture science curriculum. Practical farming assignments and projects can be made a mandatory part of the coursework to enhance students' understanding of theoretical concepts and improve academic performance.

2. Schools should establish partnerships with local agricultural experts and organizations to supplement the farming knowledge passed down by parents.

3. Schools should develop programs to increase parental and community involvement in students' agricultural education. Workshops, community farming initiatives, and family farming competitions could be organized to foster an environment that supports students in their home farming efforts and aligns their career aspirations with community needs.

4. To increase the likelihood of students choosing to study Agriculture Science at Senior High School (SHS), early exposure to home farming should be encouraged at the basic education level. Schools, in collaboration with local agricultural organizations, could introduce farming clubs, school gardens, and hands-on agricultural projects for younger students. This early exposure will help cultivate an interest in agriculture among students who may not have farming experiences at home, making them more likely to pursue the subject at higher educational levels.

5. Government and educational institutions should provide the necessary resources and training for home farming, such as seeds, tools, and agricultural education materials. This would encourage more students to engage in home farming, helping them practice agriculture at home and translate those experiences into academic and career success.

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