

Causes of Low Female Choice of Agriculture Science Programme in Senior High Schools in Ghana: A Study of Afigya Kwabre District

Kwadwo Oteng Akyina

Lecturer, Department of Interdisciplinary Studies, College of Agriculture Education,
University of Education, Winneba, Ghana.

oakyina@yahoo.com

George Oduro-Okyireh

Lecturer, Department of Interdisciplinary Studies, College of Agriculture Education,
University of Education, Winneba, Ghana.

goekyireh@yahoo.co.uk

Winifred Ansah-Hughes

Lecturer, Valley View University, Techiman Campus, Ghana.

wsamtagoe@yahoo.com

Abstract

There is low choice of Agriculture Science programme among female Senior High School (SHS) students in Ghana. The study therefore set forth to find out the underlying reasons of this phenomenon. Three hundred and ten non-science and non-agriculture science female students from three SHSs in Afigya Kwabre District were sampled for the study. A self-made questionnaire was used to collect data for the study. It was found out that the underlying reasons for the low choice of the programme were lack of guidance and counselling, lack of scholarships for females to enrol in the programme, lack of female role models in Agriculture, mathematics based nature of Agriculture Science and teaching approaches used by Agriculture Science teachers. The rest were difficult nature of Agriculture, too much practical based nature of the programme, failure in examinations by a lot of females who pursue it and more natural science based of the programme. Recommendations were made to improve upon females' choice of Agriculture Science programme in SHSs.

Keywords: low, female choice, senior high school, agriculture science programme.

Introduction

Agriculture is the mainstay of Ghana's economy. It contributes significantly to the nation's Gross Domestic Product (GDP) and employment. Statistics from the Ministry of Food and Agriculture (2011) indicate the continuous contribution of agriculture to the country's GDP. In the years 2007, 2008, 2009 and 2010, it contributed 29.1%, 31.0%, 31.7% and 30.2% respectively to the nation's GDP. Its contribution to GDP however declined in 2012 and 2013 with a contribution of 23.0% and 22.0% respectively (Ghana Statistical Service, 2014). On employment, the sector employs 50.6% of the economic active population of the country (Ministry of Food and Agriculture, 2011). Successive governments in Ghana have supported the sector with various interventions such as improved seeds, subsidized inputs to mention but a few as a way of improving agriculture production in the country.

Agriculture education is one of the key areas of education in the country. Pupils and students in the basic and secondary schools respectively learn it through the Integrated Science subject which is an integration of the three natural sciences and agriculture (Ministry of Education, Youth and Sports, 2004). This is a core subject in the country and hence one has to pass it before accessing a higher education. Agriculture science also doubles up as one of the programmes pursued at the Senior High School level. It is a three year programme designed to expose students to the various areas of agriculture namely soil science, crop science, animal science, agriculture extension and economics and agriculture mechanization so that students can specialize in one of these areas at the university level.

Females constitute a large proportion of Ghana's population. They make up 52% of the country's population (Ghana Statistical Service, 2011). Females form a greater proportion of the labour force in the agriculture sector. The sector employs 51.8% of the economically active female population in the country (Ministry of Food and Agriculture, 2011). Despite these impressive statistics of females in agriculture in the country, few women enrol in agriculture science programmes at the Senior High School (SHS) and tertiary levels. The number remains very low compared to females in other programmes like general arts and home economics. Statistics indicate that of 510 females admitted in 2014 to pursue various SHS programmes in Afigya Kwabre District, only 10 of them pursued agriculture science programme (Afigya Kwabre Education, 2014). Figures from this directorate and others have not been different in previous years. At the tertiary level, the pattern of female enrolment in Agriculture Science programme continues to be very low. Admission figures from College of Agriculture Education, University of Education, Winneba indicate that in 2013/2014, out of 338 students admitted to pursue agriculture science programme, only 37 were females. In all (from levels 100-400), a total of 79 females out of 1001 students' population were pursuing agriculture science programme in 2013/ 2014 academic year (University of Education, Winneba, 2015).

Review of Literature

Low female enrolment in science related programmes is not peculiar to Ghana. Studies in Nigeria have given similar picture. According to Osibodu (1987), females only account for 10% of students offering science, technology and mathematics disciplines. Michael (1988) revealed a similar picture. To him females' participation in engineering and technology was 20% in Nigeria compared to 40% and 50% in social sciences and pedagogical sciences respectively. A number of factors are reported in literature to account for low female enrolment in agriculture and science related courses. Bell & Fritz (1992) identified the following as playing significant role in low female enrolment in Nebraska secondary agriculture programme. They were lack of career information explaining employment opportunities for females in agriculture, lack of counselling services, lack of support network and difficulty in scheduling agriculture education classes. The study found out that peer pressure, lack of successful role models, school facilities and parental pressure were not significant factors that limited female enrolment in agriculture science programme. Mathematics based nature of science courses also deter a number of females from enrolling in science related programmes (Williams, 1987; Kahla, 1985).

Burton (1979) identified factors like home experience, personal traits, mathematical anxiety and attitude of parents as factors that impede female enrolment in science related courses. Parental belief that females who study mathematics based courses to a higher level will get crazy was a factor identified by Adegboye (1998) as limiting female's enrolment in science

related courses. Adeboye (1998) further realized that parents perceive enrolment of their female wards in higher education science programmes as unnecessary since it delays them in getting husbands. Akubuiroh (1990) observed that enrolment in higher level of education in science requires high emotional stability and since females usually experience high emotional discomfort, they are less likely to pursue science at higher level. Intimidation by subject teachers also account for low female enrolment in sciences (Ezeudu, 1998).

Females' traditional role as full-time housewives (Babiyi & Halilu, 2004) and sociological patterns of society (Abdullahi, Kalejaiye-Matti, Garba and Balogun, 2007) limit female enrolment in science related subjects. The situation where some schools reserve courses like science for males and arts and home economics for females also limits females' enrolment in science related subjects (Falshak, Yilji & Daze, 2004). The perception that some subjects are male oriented programmes while others are female oriented programmes also influences low female enrolment in science. Traditionally teaching, nursing and secretarial studies are the preserve of females while engineering, medicine and agriculture are seen as the preserve of males (Bamidele, 2000). Females perception of themselves as less capable of doing well in science related programmes also account for low female enrolment in science (Bamidele, 2000). Ekuri & Wimpado (2002) and Obasohane (2000) found factors like lack of role models and sex stereotyping as influencing factors of lack of female enrolment in science, technology and mathematics while Mari (2005) saw gender discrimination in employment with employers preferring males to females in employment in science related fields. Baryeh, Obu & Lamptey (2000) in a study of factors limiting female enrolment in engineering programmes in Ghanaian universities found absence of guidance and counselling in secondary schools and lack of female role models as causes of this phenomenon.

Statement of the Problem

Considering the importance of agriculture to Ghana's development in terms of its contribution to GDP and employment, and the large population of females in Ghana, it is expected that a large number of females will enrol in agriculture science programmes in SHS and subsequently in Universities. However, this is not the case. The number of female enrolment in agriculture science programme in various SHSs is very low. What is the cause of this phenomenon? The study therefore sought to find out the underlying reasons for low female enrolment in SHSs in Ghana despite the large female population in that sector of the economy.

Research Questions

In order to achieve the purpose of the study, the following research questions were formulated:

1. What is the level of interest of non-agriculture science female SHS students in agriculture?
2. What factors account for low female enrolment in agriculture science programme at SHS?
3. What measures can be taken to increase female enrolment in agriculture science programme at SHS?

Significance of the Study

It is hoped that the findings of this study will contribute to knowledge on students' choices of programmes in SHSs. It will assist stakeholders of education to know the causes of low female enrolment in agriculture science programme in SHSs which ultimately affect

enrolment at the university level. The study will also reveal some measures that can be taken to reverse this trend in our education sector. Female non-agriculture science students' interest in agriculture would be ascertained for necessary measures to be taken either to whip up or sustain their interest in agriculture.

Limitations of the Study

A study of this sort should have been carried out with students from a number of SHSs in Ghana. However, due to financial and time constraints, the study was carried out with students of SHSs in Afigya Kwabre District alone. Furthermore, questionnaire was the only used for data collection. Interview could have been used alongside. This was not done because of time constraints. These might in one way or the other affect the findings of the study.

Methodology

Research Design

Descriptive survey design was adopted for the study. According to Aggarwal (2008), descriptive survey design is devoted to the gathering of information about prevailing conditions or situations for the purpose of description and interpretation. This design was adopted because the study sought to find out the existing reasons for low female enrolment in agriculture science programme for appropriate conclusions and recommendations to be made.

Population, Sample and Sampling Procedure

The population of the study was all female non-agriculture science and non-science students in the three (3) SHSs in Afigya Kwabre District of Ghana. The schools were Aduman SHS, Osei Tutu II SHS and Ahenkro SHS. The total population was 600. A sample size of 310 was selected for the study. That number was sampled because the researchers wanted to study at least half of the population. Females in non-science and non-agriculture science programmes were purposively selected for the study because the study sought to find out reasons why they did not enrol in agriculture science programme. Quota sampling technique was used to select the sample from the three SHSs and from the four non-science programmes offered in Afigya Kwabre SHSs namely General Arts, Home Economics, Visual Arts and Business.

Table 1 indicates the class or form of the respondents of the study.

Table 1: Forms of Respondents

Form	Frequency	Percentage (%)
1	103	33.2
2	103	33.2
3	104	33.6
Total	310	100

Table 1 shows that 100 students from Form One, 100 students from Form Two and 100 students from Form Three were used for the study. Thus Form One and Two contributed 33.2% to the total respondents used for the study while Form Three contributed 33.6%.

Table 2 indicates the programmes pursued at SHS by the respondents of the study.

Table 2: Programmes Pursued at SHS by Respondents

Programme	Frequency	Percentage (%)
General Arts	77	24.8
Home Economics	77	24.8
Business	78	25.2
Visual Arts	78	25.2
Total	310	100

Table 2 indicates that 77 (24.8%) were pursuing General Arts. Another 77 (24.8%) were also pursuing Home Economics. Seventy eight representing 25.2% of the respondents were pursuing Business programme while the same number were pursuing Visual Arts programme.

Research Instrument

The instrument used to collect data was a questionnaire, which was designed and validated by the researchers. Questionnaire allows for collection of a lot of information from respondents within a short time. The use of questionnaire was appropriate because the respondents were literate and large in size. The questionnaire used was made up of 30 questions grouped into three sections. Section A solicited for two information from the respondents namely their forms/classes and programmes they were offering. It also consisted of two items on respondents' interest in agriculture. Section B consisted of 23 statements believed to have had influence on the respondents' non choice of Agriculture Science programme in SHS. Each statement was followed by a five point likert scale namely Strongly Agree, Agree, Not Decided, Disagree and Strongly Disagree which respondents had to check one under each statement. Section C consisted of an open ended question which required respondents to suggest ways of encouraging more females to choose Agriculture Science programme in SHS.

Method of Data Analysis

Descriptive statistics specifically frequency, percentages, means and standard deviation were used to answer the research questions that guided the study. Frequencies and percentages were used to answer research question one while mean and standard deviation were used to answer research question two. In answering research question two, weights were given to the items on the likert scale. Strongly Agreed= 5, Agree= 4, Unknown= 3, Disagree= 2 and Strongly Disagree= 1. Therefore statements with means greater than 3.00 (3.1-5.0) indicated agreement on the part of respondents that the factor addressed by the statement, was a cause of their non-enrolling in Agriculture Science programme. Means of 3.0 indicated that respondents did not know if that statement influenced them or not in their non-choice of Agriculture Science programme. Means less than 3.0 (1.0-2.9) indicated that the factor contained in the Statement had no influence in their non-choice of Agriculture Science programme. Research question three was answered by reporting the most expressed suggestions.

Results

Table 3 indicates the level of interest of respondents in Agriculture Science

Table 3: Extent of Interest of Respondents in Agriculture Science

Level of interest	Frequency	Percentage (%)
Very interested	252	81.3
Interested	48	15.5
Indifferent	0	0
Not interested	8	2.6
Not interested at all	2	0.6
Total	310	100

It can be seen in table 3 above that 252 (81.2%) and 48 (15.5%) respondents indicated that they were very interested and interest respectively in Agriculture Science programme. Only a total of 10 (3.2%) of the respondents indicated that they were either not interested or not interested at all in Agriculture Science. The results therefore indicate that a lot of female non agriculture science students are very interested in agriculture. The main reasons they gave to account for their interest are their introduction to agriculture by their parents and studies on Agriculture at the basic school level.

Table 4 indicates factors that accounted for the respondents' non-choice of Agriculture Science programme

Table 4: Factors that Influenced Respondents in not Choosing Agriculture Science Programme in SHS

Factors	Mean	SD
It is too financially costly to pursue Agriculture Science programme	2.6	0.62
Agriculture Science is male perceived programme	2.1	0.82
There is lack of guidance and counselling on Agriculture Science programme	4.4	1.31
There are lack of scholarships for females in Agriculture Science programme	4.3	0.78
There are lack of female role models in Agriculture Science programme	4.6	0.91
Agriculture Science programme is Mathematics bias and hence difficult	4.1	0.65
Males in Agriculture Science programme do not accept females in the programme	2.6	0.76
Employers prefer to employ males rather than females in Agriculture sector	2.4	0.55
My parents did not support my choice of Agriculture Science programme	2.2	0.43
My preferred SHS did not offer Agriculture Science Programme	2.6	0.56
Teaching approaches used by Agriculture Science teachers discouraged me	3.3	0.77
There are lack of job prospects in Agriculture Science programme	2.1	0.86
Agriculture Science Programme is generally Difficult	4.1	0.74
There are lack of Agriculture Science teachers in the country	2.7	1.04
Agriculture Science involves a lot practical work hence tedious to pursue	4.2	0.46
Aggregate required to enter the programme is too high for females to meet	2.4	0.51
There are no clear lines of progression in the Programme after SHS	2.1	0.66
Females who do Agriculture Science programme do not pass well	4.3	0.56
There are no avenues for resiting failed papers in the programme	1.6	0.71
My knowledge in natural sciences upon which Agriculture Science is based is very weak	4.2	0.23
Agriculture Science education in SHS is not necessary for entry to Agriculture sector	2.3	0.64
I lack the ability to study Agriculture at higher levels of education	2.1	0.33
My friends did not support my decision to pursue Agriculture Science programme	2.8	0.68

A look at the means and standard deviations in table 4 above indicate that a number of factors played a role in the respondents' non-choice of agriculture science programme at SHS. These factors were lack of guidance and counselling, lack of scholarships for females to enrol in the programme, lack of female role models in Agriculture, mathematics based nature of Agriculture Science and teaching approaches used by Agriculture Science teachers. The rest were difficult nature of Agriculture, too much practical based of the programme, failure in examinations by a lot of females who pursue it and more natural science based of the programme. On the other hand, factors like costly nature of the programme, friends' non-support of the choice, employers' preference for males in the sector, lack of job prospects in Agriculture among others were found not to significantly limit females' choice of the programme.

The following suggestions were given by respondents as ways by which more females could be encouraged to choose Agriculture Science programme in SHS. These suggestions were in answer to research question three. The suggestions were:

- 1) Granting of scholarship to females to pursue the programme.
- 2) Provision of guidance and counselling to females on the programme.
- 3) Parents support of their wards' choice of the programme.
- 4) Reduction of entry grades for females in the programme and
- 5) Helping female students acquire in-depth knowledge in the natural sciences.

Discussions

The total population of females in non-science based SHS programmes is worthy of note. They are far more than females who enrol in Agriculture Science programme. This confirms the finding in a study by Ajayi and Buessing (2013) that over 25 percent of females applying to SHSs in Ghana choose Home Economics and General Arts while males normally dominate in programmes like Agriculture and General Science. The high level of interest in agriculture indicated by the respondents is very significant. This shows that a lot of females are interested in agriculture attesting to why there are a number of females working in that sector. Most of them are involved in less skilled jobs in farming. Akyina, Osei-Owusu, Oduro-Okyireh & Gongoli (2014) found factors like interest in agriculture science, employment avenues in agriculture, high academic ability in agriculture and influence by teachers and parents as factors that influence female students choice of Agriculture Science programme.

The findings in relation to factors that cause low female choice of Agriculture Science programme in SHS are worthy of note. Bell and Fritz (1992) finding that lack of guidance and counselling and lack of support networks for females limit females' choice of Agriculture Science is confirmed by the findings in this study. The finding in this study however, disaffirmed their finding that lack of role models does not discourage females from choosing Agriculture Science programme. On the other hand, Baryeh, Obu & Lamptey (2000) findings that lack of role models and guidance and counselling limit female enrolment in engineering programmes is affirmed by this study. Thus the two factors namely role models and guidance and counselling play significant role in students' choice of a programme of study.

The findings in this study support the findings of the studies by William (1987), Kahla (1985) and Burton (1979) that mathematics based nature of most science based courses discourage females from entering into them.

Conclusions

Females have interest in agriculture. This accounts for high population of females in agriculture sector. However, only few females enrol in Agriculture science programmes in SHSs and the universities in Ghana. The findings in this study have brought to the fall the factors that limit females' enrolment into Agriculture Science programmes in SHS. Factors found as significantly contributing to low choice of Agriculture Science programme by females in SHS were lack of guidance and counselling, lack of scholarships for females to enrol in the programme, lack of female role models in Agriculture, mathematics based nature of Agriculture Science and teaching approaches used by Agriculture Science teachers. The rest were difficult nature of Agriculture, too much practical based of the programme, failure in examinations by a lot of females who pursue it and more natural science based of the programme. The least influencing factors of female students' non-choice of the programme in SHS were costly nature of the programme, friends' non-support of the choice, employers' preference for males in the sector, lack of job prospects in Agriculture and lack of Agriculture Science teachers. The rest were entry requirements, no clear lines of progression, no avenues for resiting failed examinations and non-important nature of the programme in entering into agriculture. The findings affirmed and disaffirmed current findings in relation to literature on the field of study.

Recommendations

The following recommendations are put forth by way of encouraging more females to choose Agriculture Science programme in SHS. First, guidance and counselling should be offered in basic schools to make females aware of the nature of Agriculture Science programme. This will allay the fears and misconceptions they have on the programme and hence encourage them to choose the programme in SHS. Second, successful females in the field of agriculture should be identified and made to serve as role models for up and coming females. Third, support services by way of scholarships and bursaries should be offered to females to encourage them to enter into the study of agriculture at the SHS and higher levels of education. Fourth, females' perception of difficult nature of Agriculture Science programme should be allayed. This can be done by instilling confidence in them that they are capable of doing well in the field of agriculture study. Their base in mathematics and other natural sciences should be strengthened through free extra classes. Teachers should also adopt more friendly and accommodative strategies of teaching that will whip up female students interest in agriculture.

References

- Abdullahi, Z. M., Kalejaiye-Matti, R. B., Gariba, B. & Balogun, R. B. (2007). Gender Stereotype in Nigeria Educational System: Teachers Moderating Role. *International Journal of Research in Education* 4 (1 & 2), 34.
- Adegboye, A. O. (1998). Gender Preferential Treatment by Parents and the effect on Females' choice of Mathematics as a career. *Journal of Women in Colleges of Education*, 2, 50-90.
- Afigya Kwabre Education Directorate (2014). Enrolment statistics of Senior High Schools. Unpublished document.
- Aggarwal, Y.P. (2008). *Statistics of Education*. (2nd Ed.). Delhi: Sterling.
- Ajayi, K. & Buessing, M. (2013). *Gender parity and schooling choices*. Retrieved on 25th August, 2014 from www.people.bu.edu/kajayi/ajayibuessing_genderchoice_

- Akubuiroh, V. O. (1990). The relationship between test anxiety and examination performance among SS1 Students in Nsukka urban. Unpublished M. Ed. Dissertation, University of Nigeria, Nsukka.
- Akyina, K. O., Oduro-Okyireh, G., Osei-Owusu, B. & Gongoli, M. (2014). Factors Influencing Choice of Agriculture Science Programme by Female Senior High School Students in Mampong Municipality of Ghana. *The International Journal of Humanities and Social Studies*, 2 (9), 247-251.
- Babiyi, A. A., Joda, F. M. & Halilu, Z. (2004). Women in Science and Technical Education: Problems and Prospects in Nigeria. *Journal of Women in Colleges of Education*, 8, 124.
- Bamidele, O. M. F. (2001). *Promoting Science and Mathematics Education among females in Nigeria*. A paper presented at the UNESCO/NCCE 5-Day Train the Trainer Workshop for the revitalization of Science education in Nigeria.
- Baryeh, E. A., Obu, R. Y. & Lamptey, E. L. (2000). Ghanaian Women and the Engineering Profession. *International Journal of Mechanical Engineering Education*, 28 (4), 334-346.
- Bell, L. C. & Fritz, S. (1992). *Deterrents to female enrollment in secondary Agricultural education programs in Nabaska*. Retrieved on 20th April, 2015 from <http://digitalcommons.uni.edu/aglecfacpub/8>
- Burton, G. M. (1979). Regardless of Sex. *The Mathematics Teacher*, 72, (4), 261.
- Ekuri, E. E. & Windapo (2000). Gender differences in the production of Science, Mathematics and Technology. *Research and Development*, 1, (1), 32-37.
- Ezeudu, F. O. (1998). Gender Stereotypism in Science, Technology and Mathematics Education. *Journal of Women in Colleges of Education*, 3, 21-23.
- Filshak, M. L., Yilji, G. Daze, D. D. (2004). *Problem hindering Science Education*. Unpublished document.
- Ghana Statistical Service (2014). *Gross Domestic Product 2014*. Accra: Economic Statistics Directorate.
- Kahla, B. (1985). Causes of low rate among girls and women in Science, Technology and Mathematics Education. In women education branch of the Federal Ministry of Education 1989 (eds). *Promoting STM among girls and women in Nigeria*. Lagos: NERDC Printing Press.
- Ministry of Food and Agriculture (2011). *Agriculture in Ghana: Facts and figures*. Accra: Statistics, Research & information Directorate.
- Ministry of Education, Youth and Sports (2004). *White paper on the report of education review committee*. Accra: Assembly Press.
- Obasohane, E. P. (2000). The Psycho-Sociological and Biological Interpretations of Gender Differences in Mathematical Achievement. *Nigerian Journal of Gender and development*, 1, (172), 61.
- Osibodu, B. M. (1987). Improving access of girls and women to mathematics and mathematics related education. In women education branch of the Federal Ministry of Education 1989 (eds). *Promoting STM among girls and women in Nigeria*. Lagos: NERDC Printing Press.
- Williams, G. A. (1987). *Science, technology and mathematics education for all including women and girls in Africa*. A keynote address delivered at the Commonwealth African Regional workshop on women and STM education, Accra.
- University of Education, Winneba (2015). 19th congregation's basic statistics. Winneba: UEW Publication Unit.