

Availability and Use of School Farm and other Facilities in the Implementation of Agriculture Programmes in Secondary Schools in Migori County, Kenya

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Abstract: This study focused on finding out the availability and use of school farm and other facilities in the implementation of secondary school agricultural education programmes in Migori County, Kenya. It sought to describe the available facilities and resources, and the use by students in learning school agriculture. Descriptive survey research design involving 384 agriculture students was employed. Closed-ended and open-ended questionnaires were distributed to collect data from the respondents. Data analysis was done using SPSS Version 22. Descriptive statistics (bar graph, frequencies and averages) were used to do the analysis. The study found out that certain facilities vital for the teaching and learning of agriculture do not exist at all. In cases where they exist, their uses were not satisfactory.

Keywords: Facilities, agricultural education, agricultural programmes and secondary schools.

I. INTRODUCTION

Agriculture teaching and learning is done both in the classroom and the farm (outside the classroom). Without incorporating the practical components of Agriculture, students will not concretise what is learned in the classroom. School farm is the key to this: it is where practical is done. This is done in collaboration with other facilities

In the first years when Agriculture was first done in Kenya, it was compulsory that each school that needed to be allowed to teach it must have a functioning practical farm alongside other vital facilities. This farm would be subdivided in the following sections: museum sections, demonstration section, project section and commercial sections. Schools offering Agriculture have no option but to provide the necessary teaching and learning resources if curriculum is to be properly implemented. Teaching of agricultural practices and promoting it in the secondary school curriculum will require provision of all the relevant learning resources for these practices to be of benefit to the students and schools at large.

Agriculture curriculum implementation through school farms requires specific land preparation and planting equipments like animal or tractor drawn chisel and mould board ploughs, sub-soilers, planters, rollers among others (Mwenzwa, 2011). The existing school farms today (in schools where they can be spotted) do not have the mentioned sections. To the least, learners rarely understand and appreciate that a school farm can earn income to the school and eventually provide a source of living. It is necessary that students taking Agriculture are involved in all teaching and learning programmes initiated in the school.

In America, school gardens have been associated with Agriculture teaching in schools since the late 1800s. Teachers using school gardens in a more specific subject-based approach have helped their students to improve science and math scores and have helped students develop positive attitudes toward the subjects and the environment (Childs, 2011). Knowing that schools throughout the country and around the world are having success with school gardens, teachers concerned about the environment and about their students' wellbeing are interested in incorporating gardens into their current Agriculture curricula.

According to Lautenschlager and Smith (2008), in a study to measure attitudes and self-efficacy among students before and after exposure to a school gardening programme, students' attitudes before the program affected their post-survey knowledge scores but also that the program affected student attitudes measured in the post-survey. These findings about attitude before and after exposure to a garden-enhanced curriculum with students who have low self-efficacy in the classroom are important and should speak to teachers who have access to school gardens. If attitudes and behaviours can be improved in nutrition programs, they can be improved in other areas within the academic Agriculture curriculum.

A study by MCarthy (1981) emphasized the need for occupational experience, recognizing that vocational Agriculture students possess a diverse set of interests and experiences. Furthermore, this study recognized that vocational Agriculture programs must serve audiences other than the traditional farm students. Teacher educators, state supervisors, and vocational Agriculture instructors have long recognized the value of practical experience gained through teaching with the school farms.

Most vocational agricultural programs have realized their role in serving the non-farm student. Traditional curriculums have been modelled; therefore, the means for providing more occupational experiences to learners must also be modified. School farms have the potential to help meet the changing needs of students registering for vocational education in Agriculture at the secondary level and beyond. It is important to recognise the needs of Agriculture beyond secondary school level. There are careers in Agriculture, just as other important fields.

Agriculture gives employment opportunities to more than 70 percent of the population (Onwumere, Modebelu & Chukwuka, 2016). The sector is being transformed through commercialisation at the small, medium and large scale enterprise level. The young people who are the life-wire of every society are encouraged to take up farming through Young Farmers Club (YFC) and sometimes have their own farms or gardens. They receive information and in some cases assist them in analyzing innovations towards agricultural development. It is however unfortunate that in spite of the little efforts or contributions by the students' household Agriculture, empirical data are lacking on their participation maybe because of inadequate exposure to practical Agriculture during their secondary school days or lack of practical skills (Onwumere, Modebelu & Chukwuka, 2016). There is need for more resources and facilities to be ploughed into initiation and maintenance of the school farms and entire agriculture education programmes. Interest needs to be developed in the learner at this early stage so that they can appreciate in the future, the value and place of Agriculture in the economy.

The main task of the teachers is to facilitate teaching and learning using various means and media. For a success to be recorded in this therefore, the teacher must know and understand the meaning and the process of learning. Teaching is the art or process of imparting knowledge and skills. It involves all the activities of educating or instructing an individual on the right ways of life. More so, a teacher is someone who delivers an educational program, and assesses students' performance in a school setting. Teaching can be done informally within the family which is called home-schooling or in the wider community. Formal teaching may be carried out by teachers who enjoy a status in some societies on a par with physicians, lawyers, engineers and accountants etc. A teacher's professional duties may extend beyond formal teaching. Outside of the classroom, teachers may accompany students on the field trips, supervise study halls, help with the organization of the school farm activities and serve as a supervise for extracurricular activities. Essentially, the general principles of teaching are that teachers with adequate readiness teach more effectively, efficiently and better. A motivated teacher teaches better than the unmotivated one.

School farm is also a component of the school activities which has link with the birth of a more productive Agriculture. It is a selected plot of land in the school environment where students' carryout practical Agriculture both in crop production and animal husbandry. It helps the students to acquire knowledge and practical skills in Agriculture and agricultural related opportunities. Onwumere *et al*, (2016) outlined some of the benefits of school farm to students' learning to include generating circumstances for students to market agricultural products, providing students with supervised occupational experience in agricultural productivity and encouraging the use of records and reports similar to those used in Agriculture.

Purpose of the Study

The purpose of this study was to describe the status and use of school farm and other facilities for implementing agricultural education programmes in Migori County, Kenya.

Objectives of the Study

The objectives of the study were:

- i. To describe the availability of school farm and other facilities used in teaching agriculture.
- ii. To find out the extent to which the school farm and other facilities are being used to implement agricultural education programmes.

II. METHODOLOGY

Research Design

The study adopted the descriptive survey design.

Research Environment

The study was conducted in Migori County. Migori County is in the former Nyanza Province of South-Western Kenya and borders Homa Bay County (North), Kisii County (North East), Narok (South East), Tanzania (West and South) and Lake Victoria (West). The County also borders Uganda via Migingo Island in Lake Victoria as shown in Appendix D. The head-quarter is Migori town, which is also the largest town. The population of the County according to the KNOEMA (2016) population survey was 1,126,300. Migori County rests in the sugar belt wetlands of Western Kenya and is mostly at the heart of the African tropics. However, the county enjoys ambient climate due to high altitude and the cool breeze from the bordering Lake Victoria.

Sampling Methods

A formula by Cochran (1977) for determining sample size was used to get 384 Agriculture students. The equation for calculating sample size is shown below:

$$\text{Unlimited population: } N = \frac{z^2 \times \hat{p} (1 - \hat{p})}{\varepsilon^2}$$

Where;

z = the z score

ε = the margin of error

N = population size

\hat{p} = the population proportion

In this study, the researcher uses 95% confidence, and a margin of error of 5%, assuming a population proportion of .5, and unlimited population size. Remember that z for a 95% confidence level is 1.96 from the z -table (Appendix E). Substituting the formula;

$$N = \frac{1.96^2 \times .5(1 - .5)}{.05^2} = 384.16$$

Consequently, a sample of 384 was arrived at and distributed as shown in Table 1.

TABLE I: SAMPLE OF STUDENTS INCLUDED IN THE STUDY FROM DIFFERENT SCHOOL TYPES

| School Type | Number of Schools | Total Agriculture Students | Number of Schools Sampled | Sample Size |
|-------------|-------------------|----------------------------|---------------------------|-------------|
| Boys' | 13 | 390 | 2 | 48 |
| Girls' | 17 | 420 | 2 | 48 |
| Mixed | 179 | 2,880 | 12 | 288 |
| Total | 214 | 3,690 | 16 | 384 |

Instrumentation

A questionnaire consisting of closed and open-ended items was used to collect data. The questionnaire was constructed using Likert scale. The questionnaire collected information concerning the school farm and other agriculture facilities in schools.

Data Analysis

The collected data was first cleaned up for any errors such as incompleteness or inaccurate marking of responses. Data was then coded and recorded to reduce mass for ease of analysis. Data was then entered into the computer for analysis using Statistical Packages for Social Sciences Version 22. Descriptive statistics was used in describing nominal data for this study. Data was further analysed and presented using measures of central tendency i.e. means and percentages where appropriate.

III. RESULTS AND DISCUSSION

Presence of a School Farm

The research sought to know if there are school farms within the schools in Migori County. The results are as shown in Table 2. A school farm is the Agriculture laboratory where practical Agriculture is taught. An ideal school farm must have four sections: demonstration sections, project section, crop museum and commercial section from where the school can produce for sale.

TABLE II: PRESENCE OF SCHOOL FARM (N = 384)

| Options | Frequency | Percent |
|--------------|------------|--------------|
| Yes | 331 | 86.2 |
| No | 53 | 13.8 |
| Total | 384 | 100.0 |

From the data, it can be seen that majority (86.2%) of the respondents have school farms in their schools while a small fraction (13.8%) did not have school farms in their schools. It is therefore evident that most schools in Migori County have school farms though their state, access by students and use for intended practical Agriculture teaching cannot be told at this level. The big question however is how the schools without farms teach and practice Agriculture. School farms are not just spaces for growing food items; they are complete learning zones, which largely succeed in taking learning to new heights.

School farms are essential in matters teaching a variety of Agriculture topics, whether in crop rotation, mixed cropping, inter-cropping, to mention but a few. For an effective operation of a school farm, pre-requisite implements and practical equipment should be acquired and placed in the farm. The knowledge obtained by learners from practical activities conducted on-farm helps re-enforce what is taught in the classrooms and teaches them about eating healthy foods, about how food arrives in our homes from the farms among others. It also gives the students first-hand knowledge on how to run agricultural businesses (Ighakpe, 2018).

Frequency of Visit to School Farm for the Learning of Agriculture

The research sought to know how often Agriculture students in Migori County visit the Agriculture farms to learn Agriculture. The results are as shown in Table III.

TABLE III: FREQUENCY OF VISITING SCHOOL FARM (N = 380)

| Visit to school farm | Frequency | Percent |
|----------------------|------------|--------------|
| Weekly | 185 | 55.9 |
| Monthly | 51 | 15.4 |
| Termly | 50 | 16.1 |
| Never | 45 | 12.6 |
| Total | 331 | 100.0 |

Most (55.9%) of the students in Migori County taking part in the study indicated that they visit the school farm weekly to learn Agriculture while another 15.4% said that they only visit the farm once a month for the same purpose of learning. Further 16.1% indicated that they go to the farm once in a term for purposes related to Agriculture teaching and learning. A significant number (12.6%) of the respondents showed that they never visit the school farm at all. These findings are contrary to that of Konyango and Asienyo (2015) that says that the school farms do not serve their key role of teaching practical Agriculture and an area for experiential teaching of the subject. The findings further say that no schools can boast of even having a school farm to be used as a laboratory for teaching the subject and that in the schools where the

farms are present, they are purely commercialised under the management and control by the principal and the school bursar. In Migori County, this study affirms that the school farms are available and students frequently visit them to learn Agriculture.

Facilities are Available in School for the Teaching of Agriculture

The research sought to know the various facilities available in schools for instructions in Agriculture. The results are as shown in Table IV.

TABLE IV: FACILITIES AVAILABLE FOR TEACHING OF AGRICULTURE (N = 384)

| Options | Frequency | Percent |
|--------------------------|------------|--------------|
| Livestock | 10 | 2.6 |
| Agriculture workshop | 92 | 24.0 |
| Agriculture laboratory | 10 | 2.6 |
| Farm tools and equipment | 239 | 62.2 |
| Multiple facilities | 33 | 8.6 |
| Total | 384 | 100.0 |

From the results, 2.6% of the respondents indicated that livestock are the main resources available for teaching and learning of Agriculture in their schools while about a quarter (24.0%) identified Agriculture workshop as the main facility for the same purpose. A few respondents (2.6%) showed that Agriculture laboratory is a facility available in school to teach Agriculture with a further majority (62.2%) identifying farm tools and equipments as the Agriculture facilities in their schools. Further 8.6% identified more than one group of facilities as being available in schools. Facilities play a key role in the teaching of Agriculture. They influence the teaching methodologies and even the kinds of programs that the teachers can mount to enhance effective curriculum delivery. This study did not identify school farm as a dominant facility contrary to the findings from the study by Aholi, Konyango and Kibett (2018) that identified the school farm as the main Agriculture facility. The low integration of practical Agriculture in the teaching and learning process due to the limited facilities could further derail the teaching and learning process (Njura, Kaberia, Taaliu, 2019).

Results from the study by Konyango and Asienyo (2015) on resources and facilities for Agriculture teaching showed that efforts had been made by the education stakeholders at the inception of Agriculture, to provide resources and facilities that could be used as a foundation for building a firm human resource base for rural advancement. However the ever-rising appetite by Kenyan schools and education stakeholders for high grades in final examinations has watered down the relevance of practical skills in agricultural education hence negating the highly needed educational reforms in which vocational and practical subjects like Agriculture are given more priorities in resource provision.

Ever Heard of Agriculture Laboratory

The respondents were asked to indicate if they had ever heard of Agriculture laboratory as a facility for teaching Agriculture in schools. The results are as shown in Figure 1.

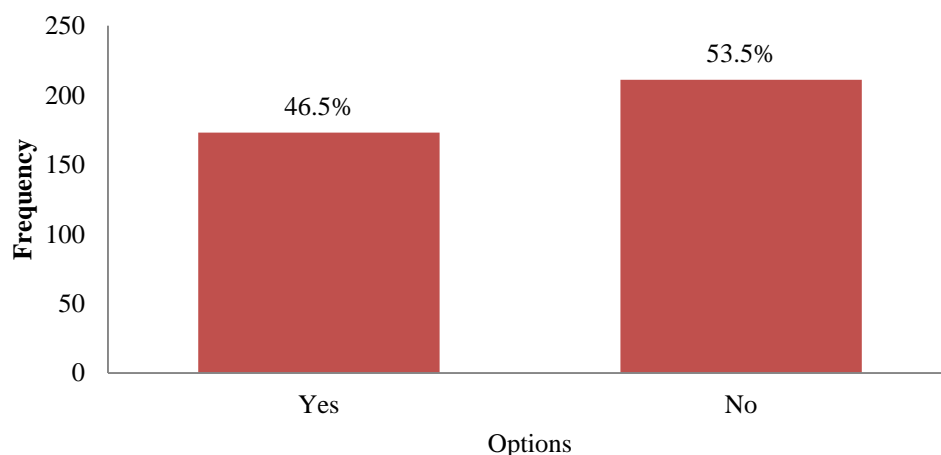


FIGURE 1: EVER HEARD OF AGRICULTURE LABORATORY (N = 384)

The results on Figure 4 imply that slightly less than half (46.5%) of the proportion of the respondents have heard of Agriculture laboratory while the majority (53.5%) had never heard of it. Agriculture laboratory is a vital component in the teaching of practical Agriculture in schools and the fact that a huge number of students of Agriculture in Migori County have never heard of it could mean that they have never been into an Agriculture laboratory. As Waithera (2013) puts it, teachers should handle the subject in a manner that will encourage majority of students to take it and this can only be achieved by teaching it practically in the school laboratory and farms. Huss, Jeanine, Baker and Cheryl (2010) further put it that Agriculture can play a significant role in enhancing scientific literacy since it incorporates essential plant and ecosystem concepts into the classroom setting. Plus, Agriculture, like other sciences, is not static and includes much trial and error, investigation, and innovation which can advance the knowledge needed to solve agricultural problems.

Existence of Agriculture Laboratory in Schools

The respondents were asked to indicate if Agriculture laboratory exists in their schools. The results are as shown in Figure 2.

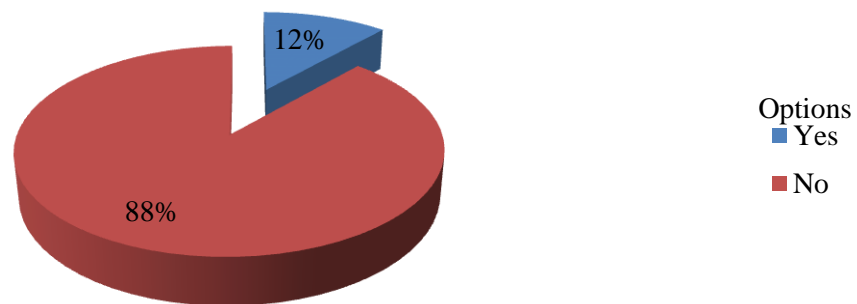


FIGURE 2: AGRICULTURE LABORATORY EXISTS IN YOUR SCHOOL (N = 273)

From the 273 respondents who had indicated that they had heard of Agriculture laboratory, very few (12%) indicated that the facility exists in their schools while the majority (88%) showed that it does not exist. This implies that majority of students of Agriculture in Migori County do not have access to Agriculture laboratory as a vital facility for the teaching of practical Agriculture. This further compounds the problem of theoretical teaching and learning of Agriculture in schools in Migori County.

Ever Heard of Young Farmer's Club of Kenya (YFC-K)

The researcher sought to know if Agriculture students of Migori County had heard of the YFC-K. The results are as displayed in Figure 3.

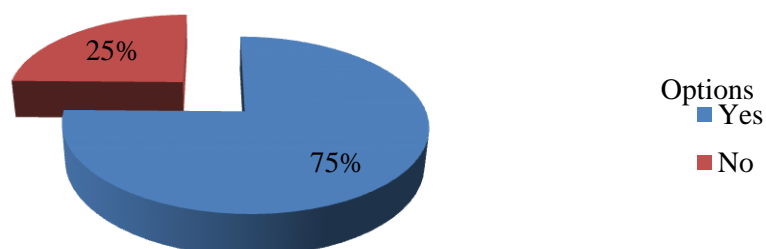


FIGURE 3: EVER HEARD OF YFC-K (N = 384)

It is shown that three-quarters (75%) of the respondents had heard of the YFC-K. A quarter (25%) of the respondents said that they had never heard of the organisation. The YFC-K is an organisation at the secondary school level meant for students taking Agriculture to come together and partake in various learning activities within and outside the school. By being members of this body, students are able to learn many aspects of Agriculture including leadership skills as well as being accorded the opportunities to attend and take part in the ASK shows and many more of such activities organised outside the school. According to ASK (2014), YFC-K avails opportunities for young people to not only to be able to take on Agriculture as a viable and profitable option for employment but inculcates life skills for sustainable development and self-sustenance as youths. The YFC chapter further explains that the existence of these clubs in secondary schools in Kenya will stimulate interest of youths in Agriculture through exposure to innovative agricultural practices and agricultural potential information through slideshow presentations and interactive internet programs thus, raising a generation of farmers willing to use information communication technology to create and utilize agricultural extension information.

Ever been Enrolled in YFC-K

The researcher sought to know if Agriculture students of Migori County had been registered as members YFC-K. The results are as displayed in Figure 4.

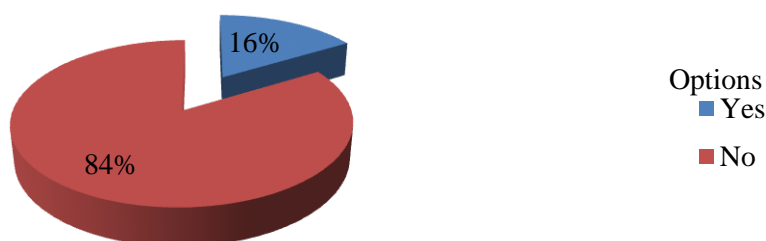


FIGURE 4: EVER ENROLLED IN YOUNG FARMER'S CLUB OF KENYA (N = 384)

From the findings of this study, just a few (16%) of the respondents had been enrolled as members of the YFC-K. Majority of them (84%) had no YFC-K membership. This implies that most of the Form Three Agriculture students in Migori County had not registered as YFC-K members therefore missing out on the vital roles that the organisation plays in the learning and development of Agriculture in Kenya. This could be as a result of the fact that enrolment in YFC-K is voluntary and at times attract even students who do not take Agriculture subject. There is currently no data providing the status of YFC-K membership in Kenyan schools despite the potential of this organisation in changing young people's perceptions about Agriculture in Kenya. The findings of this study could provide a means to revive it.

Ever Heard of the ASK Organisation

The researcher sought to know if Agriculture students of Migori County had ever heard of the ASK Organisation. The results are as displayed in Table V.

TABLE V: EVER HEARD OF THE ASK ORGANIZATION (N = 384)

| Options | Frequency | Percent |
|--------------|------------|--------------|
| Yes | 255 | 66.4 |
| No | 129 | 33.6 |
| Total | 384 | 100.0 |

The results show that majority (66.4%) of the respondents had heard about the ASK Organisation while about a third (33.6%) indicated that they had not heard of it. ASK is a state organisation under the Ministry of Agriculture (MOA) whose key mandate is to organise and conduct agricultural shows in Kenya. The Society's key output is the series of annual agricultural exhibitions and trade fairs held throughout the Kenya in the major cities and towns such as; Nairobi International Trade Fair, Mombasa International Show, Nakuru National Show, Eldoret National Show, Kisumu Regional Show, Nyeri National Show, Kitale National Show, Meru National Show, Nanyuki Branch Show, Embu Branch Show,

Machakos Branch Show, Kisii Branch Show, Kakamega Branch Show, Kabarnet Branch Show, Garissa Branch show and Migori Satellite Show (ASK, 2014). Furthermore, ASK is an umbrella organization for other subsidiary organizations including the Young Farmers Club of Kenya, Kenya Ploughing Organization, Kenya Farmers Journal, Kenya Livestock Breeders Organisation and The Royal Agricultural Society of the Commonwealth. The role of this organisation in Kenyan agricultural development therefore cannot be over-emphasised.

Current Membership to YFC

The researcher sought to know the status of YFC membership at the time of the study and the results are shown in Table VI.

TABLE VI: MEMBERSHIP TO YFC (N = 384)

| Options | Frequency | Percent |
|--------------|------------|--------------|
| Yes | 60 | 15.6 |
| No | 324 | 84.4 |
| Total | 384 | 100.0 |

It is shown that only 15.6% of the respondents were members of the YFC while the majority (84.4%) were not members at the time of this study. This implies that the Form Three students have not embraced the benefits of being YFC members or possibly, they do not understand the reasons for the membership.

Types of Agricultural Activities done by Agriculture Students

The researcher sought to know the activities of Agriculture students and the results are shown in Table VII

TABLE VII: TYPES OF AGRICULTURAL ACTIVITIES YFC MEMBERS ARE INVOLVED IN (N = 384)

| Options | Frequency | Percent |
|--|------------|--------------|
| Crop related | 100 | 39.2 |
| Livestock related | 120 | 47.1 |
| Agribusiness related | 12 | 4.7 |
| Crops, livestock and agro forestry related | 23 | 9.0 |
| Total | 255 | 100.0 |

From the findings of the 255 respondents who responded to this item, 39.2% indicated that they are involved in crop related activities as Agriculture students while 47.1% showed that they take part in livestock related activities. A further 4.7% indicated that they take part in agribusiness related ventures while another 9.0% indicated that they are involved in crops, livestock and agro forestry related ventures. It can be said therefore that in most schools, livestock related activities that are used for learning of Agriculture are more common compared to others such as crops, agribusiness and agro-forestry. One respondent from Masara Mixed Secondary School stated as follows:

“We are actively engaged in growing crops in school like currently we have planted kales on the farm and we are in the process of harvesting the crop”

Another respondent from Sori boys' secondary stated as follows:

“We grow crops of many varieties and rear hens in school which are cooked in the school kitchen and sold in Sori market”

Types of Agricultural Income-generating Activities in Schools

The researcher sought to know the income-generating activities of Agriculture students in their schools and the results are shown in Table VIII.

TABLE VIII: TYPES OF AGRICULTURAL INCOME-GENERATING ACTIVITIES IN SCHOOLS (N = 384)

| Options | Frequency | Percent |
|-------------------|------------|--------------|
| Crop related | 24 | 6.3 |
| Livestock related | 20 | 5.2 |
| None | 340 | 88.5 |
| Total | 384 | 100.0 |

From the responses, 6.3% of the respondents listed crops related activities while 5.2% listed livestock related activities to be the ones done to generate income in their schools. Majority (88.5%) indicated that there is no agricultural income generating activity in their schools. It means therefore that most students and the schools in Migori County by extension do not take part in agricultural income generating activities. This could further imply that secondary schools in Migori County have not appreciated the fact that Agriculture can be done as a profit-making venture, borrowing from one of the objectives of secondary school Agriculture in Kenya. If schools do not practice this, then it could be a mirage the expectation that young people out of schools will create jobs in Agriculture but rather remain job seekers. Income generating activities especially for schools teaching Agriculture play two critical roles which are educating students on enterprising skills which they need to be successful farmers after school and generation of income for the schools making them income self-sufficient (School in A Box Guide Series, 2008). These findings are in agreement with those from Amos and Koda (2018) done in Tanzania and found out that schools engaging in agricultural income-generating activities are able to produce food for their students and staff at the same time financing provision of quality education. The study further concluded that such schools are able to fund the purchase of essential teaching and learning materials relieving them of the financial burdens.

IV. CONCLUSION

From the results of this study, the following conclusions were drawn:

- i. There are few agriculture resources in schools and usage in learning of agriculture is low.
- ii. The agricultural organizations in schools such as YFCK are in very low existence and membership is low.

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