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CHALLENGES IN THE IMPLEMENTATION OF SECONDARY SCHOOL AGRICULTURE CURRICULUM IN KENYA'S ARID AND SEMI ARID COUNTIES: THE STUDENT'S PERSPECTIVE

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ABSTRACT: Agriculture being the backbone of the country's economy, preparation of human resource to take the sector to a higher height is inevitable. For this to be achieved, agriculture curriculum implementation in secondary schools is paramount. Agriculture curriculum implementation is expected to equip learners with scientific knowledge and vocational skills they can use in their ecological environments. Despite the teaching of agriculture in ASAL secondary schools, ASALs have remained agriculturally under-exploited experiencing persistent food shortages. This could be partly attributed to challenges in implementation of the curriculum. Most studies have been done on challenges facing teachers in implementing agriculture curriculum in secondary schools. However, very few have focused on challenges facing the learner yet learners are the consumers of the curriculum. This study thus documents the learners' perspective of the learning resource availability, adequacy and frequency of use in their schools. The study was carried out in ASAL counties of Baringo, Makueni and Narok. The study found out that agriculture textbooks were available, adequate and frequently used. The school farm was also rated as available, adequate but rarely used. The agriculture work shop, laboratory and models were unavailable in schools while all the other resources were inadequately available. Unavailability, inadequacy and non-use of all the learning resources except the agriculture text books compromise on the quality of agricultural skills and knowledge that these learners acquire at secondary school level. This study recommends that teachers of agriculture need to be innovative and practical oriented in implementing the agriculture curriculum.

KEYWORDS: Challenges, Implementation, Agriculture curriculum, Arid and Semi Arid Counties.

1 INTRODUCTION

In Kenya, nearly 10 million people live in the ASALs which constitute about 84 percent of the country's land and experience recurrent drought and famine (Kyule, Konyango & Nkurumwa, 2015b). However, most of the farming is done in the high and medium potential areas which only accounts for less than 17 percent of Kenya's land while the rest of the land is classified as Arid and Semi Arid Lands [ASALs] which are considered less productive (Ministry of State for Development of Northern Kenya and other Arid Lands, 2011). Although Kenyan ASALs have great potential for agricultural production, they remain largely under exploited (Ministry of Planning and National Development, 2007a). Rainfall patterns are unpredictable subjecting ASAL areas to moisture stress hence improved agricultural production can only be attained through knowledge and skills that promote Dry Land Agriculture (DLA). In some developed countries such as the United States of America, agricultural institutions have taken charge of providing leadership and human resource development among the learners of agriculture at secondary school level (Kanyi, Vandenbosch, Ngesa & Kibett, 2011) and Kenya can borrow from them.

Curriculum implementation is a crucial process that requires coordinated efforts from the school administration, the agriculture teachers, the learners and other stakeholders who may be involved in supporting the process. Cheplogoi (2014) asserts that effective curriculum implementation is a product of providing adequate teaching and learning materials, professionally trained and competent personnel as well as continuous support to the process financially, morally and in kind. According to Okogu (2011), curriculum implementation is a composite of the learner, teacher, teaching learning resources, teaching methodologies, anticipated experiences and outcomes. However, inability to provide any of these requirements poses a challenge to the process and in return affecting the quality and level of agricultural skills and knowledge acquired by the learners after the programme.

Effective curriculum implementation requires that learners learn by doing (Konyango & Asienyo, 2015; Waiganjo, Wambugu, Ngesa & Cheplogoi, 2015). To create conducive environment for learning by doing, learners need access to all the relevant agriculture leaning resources. According to Mwiria (2002) and Owoeye and Yara (2012), agriculture learning resources include a viable school farm, library, laboratory, books, workshops, spacious class rooms, relevant equipment like, machinery, hand tools, inputs and farming tools. A spacious library with adequate and up to date agriculture books and other reference materials have been found to have a positive correlation to the performance of students in agriculture (Makori & Onderi, 2013). The school farm as a teaching learning facility should be easily accessible and large enough to accommodate all students during project or demonstration work and a model farms that the community can learn from (Nyang'au, Kibet & Ngesa, 2011).

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 promoting DLA in the secondary school curriculum will require provision of all the relevant learning resources for these practices to be of benefit to ASAL areas and the country at large. Agriculture curriculum implementation in Kenyan ASALs requires specific land preparation and planting equipments for DLA like animal or tractor drawn chisel and mould board ploughs, sub- soilers, planters, rollers among others (Mwenzwa, 2011). For schools to provide all these resources for learning purposes adequate financial support to the subject is paramount as was there during the introduction time in 1960s. Without financial grant, no viable agriculture curriculum can be implemented.

The history of agriculture curriculum implementation has come a long way since it was first introduced in Chavakali boys in 1959. However, the 8-4-4 system came up with a contradictory strategy that down-played the value of schools farms by recommending the teaching of agriculture in all schools irrespective of availability of land. By so doing the government failed to identify needs of school agriculture in ASALs (Saina, Kathuri, Rono, Kipsat & Sulo, 2012). The resources and facilities required included a viable school farm, laboratories, books, workshops, relevant equipment like machinery and hand tools, seeds, inputs and farming tools (Mwiria, 2002). There is need therefore to document on agriculture learning resource availability, adequacy and frequency of use in ASAL secondary schools. The agriculture learning resources focused on this study are: agriculture workshop, agriculture laboratory, agriculture rooms, farm store, farm tools and equipments, school farm, agriculture textbooks, agriculture charts, agriculture models, agriculture videos and irrigation equipments. Most studies have been done on challenges facing teachers in implementing agriculture curriculum in secondary schools. However, very few have focused on challenges facing the learner yet learners are the consumers of the curriculum. This study thus documents the learners' perspective of the learning resource availability, adequacy and frequency of use in their schools.

2 METHODOLOGY

A mixed research method was used employing descriptive research design to collect both qualitative and quantitative data. This design enabled the researcher to describe the nature of a situation as it exists at the time of study (Best & Khan 1993; Creswell, 2008; Gay, 1992 and Kothari & Garg, 2014). A total of 5,600 form three agriculture students were targeted while the accessible population was 2,470 from the five selected Sub counties in three study counties of Baringo, Makueni and Narok. Multi-stage sampling was used to select a sample of 290 form three agriculture students from five purposively selected sub counties of Mogotio, Marigat, Kibwezi, Makindu and Narok North. However, the actual sample size accessed was 271 respondents.

Both qualitative and quantitative data were collected using semi-structured questionnaires. They were analyzed using SPSS. Simple descriptive statistics mainly; means, frequencies, percentages, standard deviations and bar charts were used to present data on learning resource availability, adequacy and frequency of use.

3 RESULTS AND DISCUSSIONS

GENERAL CHARACTERISTICS OF THE RESPONDENTS

The total number of student respondents who participated in the study was 271 and their distribution per Sub-county was as shown in figure 1. Kibwezi Sub-county had the highest percentage proportion while Marigat had the least.

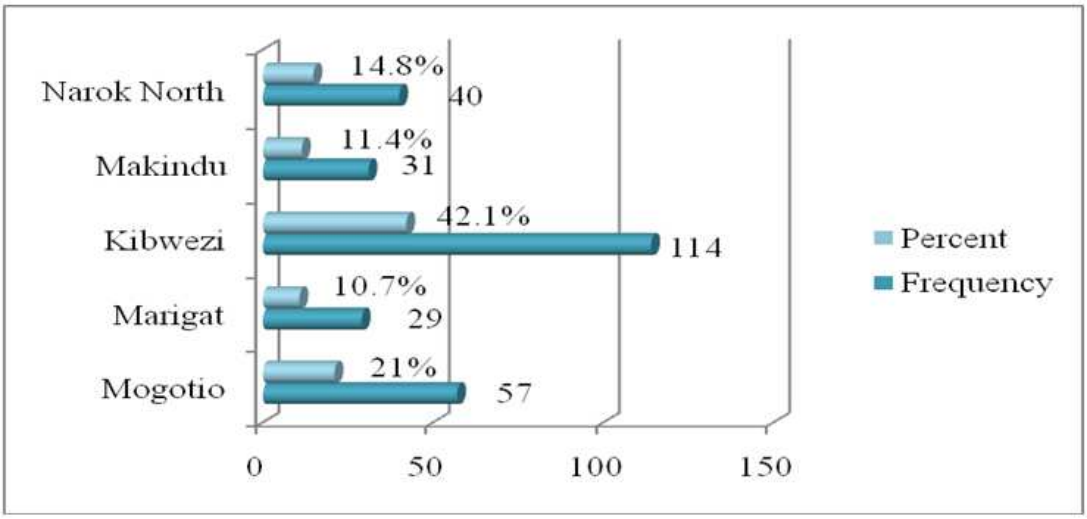

Figure 1: Number of student respondents' per Sub-county

Source: Survey data, Baringo, Makueni and Narok counties, 2016

Characteristics that were investigated included: gender, age and subject choice and preference.

Gender: Past study by Eze, Ezenwaform and Obi, (2015), indicated male dominance in the uptake of the subject and in these ASAL schools the scenario is yet to change. However, this stirs interest since a study done by Kyule, Nkurumwa and Konyango (2015a) indicated that most of the small-scale farming in the rural areas representing over 80 percent of the farmers in the country is done by women. There is a mismatch between what the girl child expects while in school and what they end up undertaking after school. The low enrolment of female students in the subject could be attributed to traditional and sociological patterns where the subject is viewed as meant for males, lack of proper guidance and counseling and parental influence on subject selection (Akyina, Oduro & Ansah-Hughes 2015).

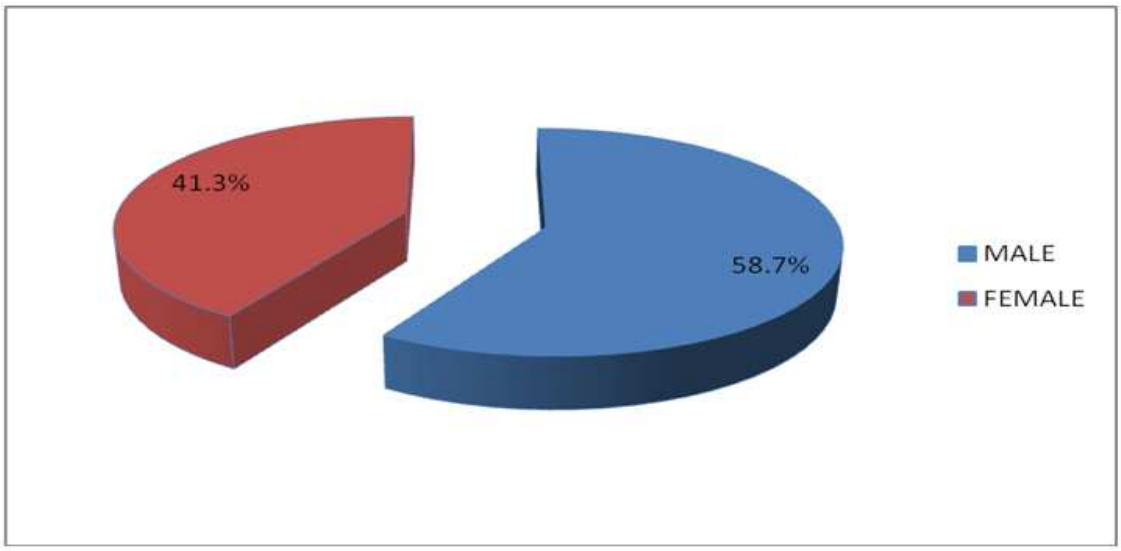

Figure 2: Percentages of student respondents' gender

Source: Survey data, Baringo, Makueni and Narok counties, 2016

Age: The respondents' age ranged between 15-23 years, with the mean age being 17 years which is slightly above the expected age for their level of study as per the Ministry of Education. Only 46% of these respondents are within the correct age bracket for form three, 6.3% are below the age while 76.6% are beyond the expected age. A study done by Abdullahi, Mlozi & Nzalayaimisi, (2015a) found out that at the appropriate age, learners are able to make informed decisions on their subject selection in schools. Therefore most of them will make choices due to intrinsic and not extrinsic reasons. Figure 4 shows the age distribution in percentage.

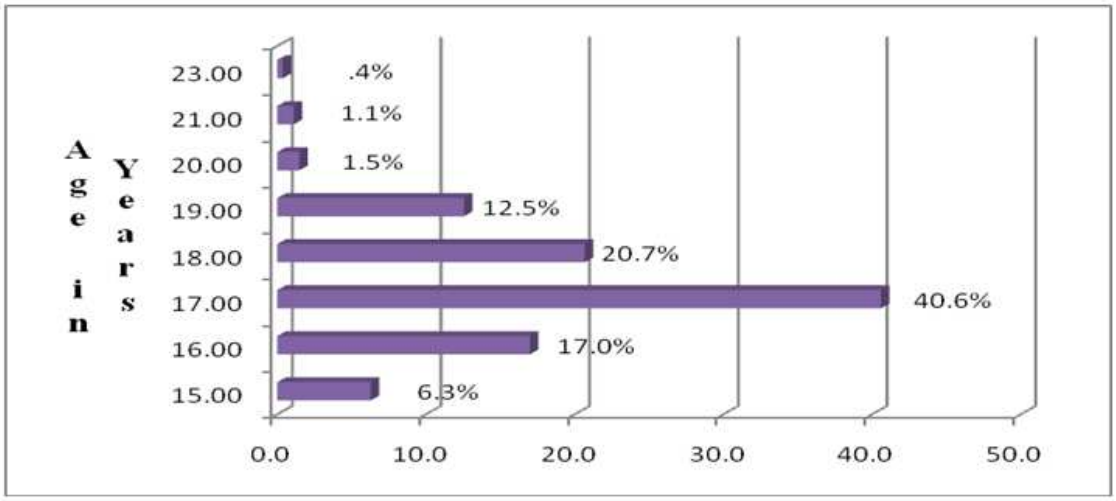

Figure 3: Percentages respondents' age in years

Source: Survey data, Baringo, Makueni and Narok counties, 2016

Additionally, learners' age also influences curriculum implementation since when learners are appropriately placed in their respective classes they have basic knowledge and skills for effective learning and are not impaired by age related inadequacies. Some of the factors that have been attributed to late school going age in ASALs are accessibility and proximity of schools therefore learners have to be old enough to bear the distances and poverty leading to absenteeism hence

repeating of classes. The cultural way of life of the communities in ASALs like nomadism has contributed a great deal towards late schooling (Abdullahi, Mlozi & Nzalayaimisi, 2015b). However, it's important to note that most of the over age respondents are male since most of the overage female in ASALs are prone to early marriage and pregnancies hence dropping out of school.

Subject choice and preference - Respondents were asked to indicate who influenced them to take up agriculture subject and 84% chose the subject due to future career aspirations. This contradicts the results of by Kabugi (2013), who found out that parents have a great influence on their learners choice of subject. In this study, the parents influence on choice for agriculture subject was only 2%. This could be attributed to the learners' age making them independent in decision making regarding the career path way to take. The agriculture teachers level of influence on subject choice was 9%, peers was 3% while school policy was 2%.

Availability of learning resources: All respondents indicated availability of agriculture textbooks in their schools as shown in figure 4. Thus schools have invested a great deal in obtaining textbooks for learners. Most of the schools were found to have a school farm as well as farm tools and equipments. This agrees with a study done in Tharaka Nithi County that found out that all schools in the county had access to agriculture text books as well as a school farm (Muchiri & Kiriungi, 2015). Only 32.5% and 3.3% of all the respondents indicated availability of agriculture charts and agriculture videos in their schools respectively. These being ASAL areas where irrigation is paramount for agricultural learning projects to materialize, only 21% of the respondents have irrigation equipment in their schools. However, across the three counties, there was total absence of agriculture workshop, agriculture laboratory as well as agriculture models. An agriculture workshop was a key learning resource and for that reason when agriculture subject was being introduced in the curriculum in the late 1950's the funding agencies and the Government were building workshops in the schools offering agriculture then (Konyango & Asienyo, 2015). Narok high school was one of the beneficiaries of such funds and the only school that benefited from such financial support across the ASAL regions. It is worth to note that the respondents in this school are not even aware of the existence of such a facility within their institution. The workshop in this school has been converted to a store for the broken furniture (see Figure 5). This is a solid reflection of the loss of focus that agriculture curriculum implementation has taken from its practical and vocational ideal to theoretical implementation

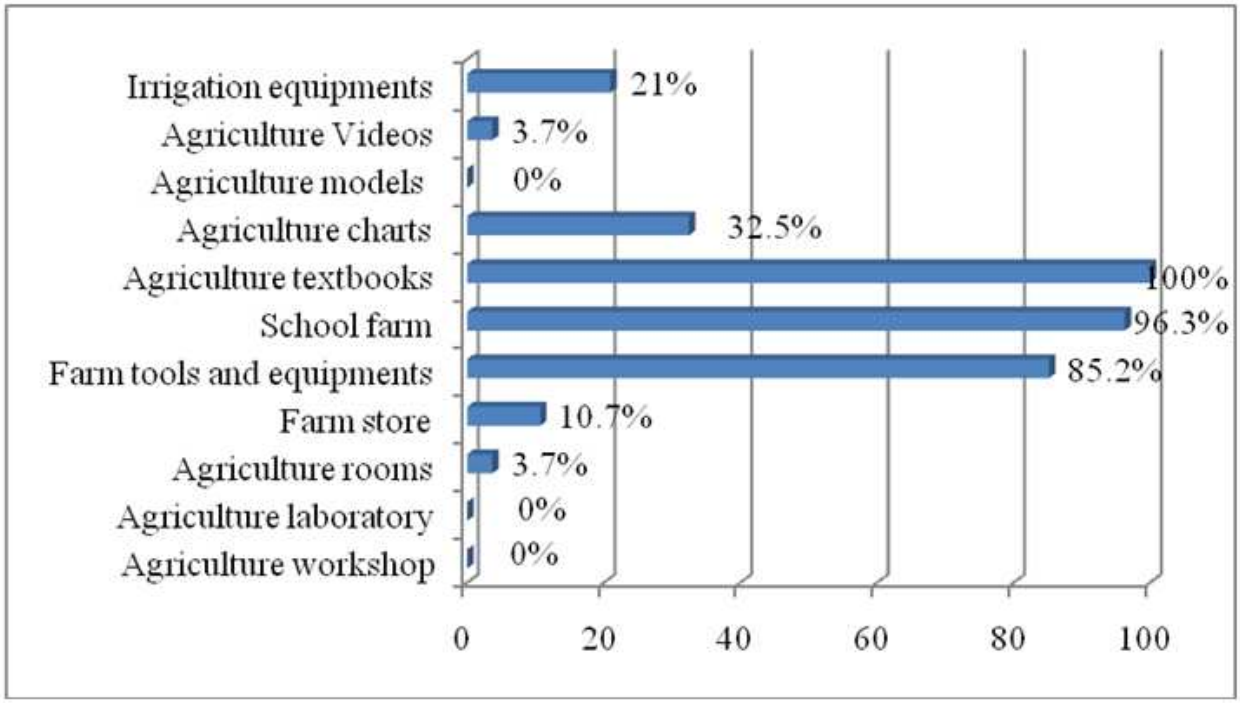

Figure 4: Availability/Absence of learning resources

Source: Survey data, Baringo, Makueni and Narok counties, 2016

Figure 5: The status of the workshop in Narok high school

Source: Survey data, Baringo, Makueni and Narok counties, 2016

Adequacy and frequency of use of learning resources by the respondents: Effective curriculum implementation is influenced by adequacy and frequency of use of learning resources. Respondents were therefore asked to rate the adequacy and frequency of use of learning resources available in their schools. Their responses were as discussed below:

Adequacy and frequency of use of agriculture rooms - Only ten respondents from Mogotio Sub County indicated to have a specific room for their agriculture lessons which was moderately adequate and which they made use of during every lesson. Upon probing from the respondents it was clear that agriculture being an optional subject and blocked with other subjects at the same time, learners and their teacher locate for vacant rooms if available during the lesson time. This translates to time loss during every agriculture lesson affecting curriculum implementation. In some schools, the situation is too dire that students take their lessons under trees sited on stones as in the figure 6 below.

Figure 6: Learners taking their lesson under a tree due to inadequacy of class rooms

Source: Survey data, Baringo, Makueni and Narok counties, 2016

A study done in Thailand by Pakkapong, Junlex and Jaikaew, (2015) established that un conducive learning environment was an obstacle to effective teaching and learning of agriculture and hence hampered smooth implementation of the curriculum.

Adequacy and frequency of use of the farm store: The farm store was only available in two Sub counties. Asked to rate it's adequacy and frequency of use as a learning resource, 19 respondents in Mogotio indicated it's moderately adequate and they used it occasionally. The ten respondents in Marigat rated it to be inadequate and they had never used it as a learning resource. Location of these schools in the ASALs may have contributed to them not seeing the need to construct a farm store and the non use of those already existing could explain the reason as to why learners never make use of them as learning resources.

Adequacy and frequency of use of farm tools and equipments - Respondents from all the five Sub counties have access to farm tools and equipments at different levels of adequacy and frequency of use as shown in Table 1.

Table 1. Adequacy and Frequency of use of Farm Tools and Equipments

Sub-county	Adequacy of farm tools and equipments			Frequency of use of farm tools and equipments		
	Inadequate	Moderate	Adequate	Never	Occasionally	Frequently
Mogotio	28	19	10	47	10	0
Marigat	0	20	0	20	0	0
Kibwezi	78	10	5	84	9	0
Makindu	20	0	0	20	0	0
Narok-North	20	10	10	24	16	0
Total	146	59	25	195	35	0

Source: Survey data, Baringo, Makueni and Narok counties, 2016

Out of the 230 respondents who have access to farm tools and equipments in their schools, 63.5% rated them as inadequate an indication that if they were to use them during out of classroom instruction then they have to share and waste a lot of time waiting to use them. 25.6% rated them as moderately adequate meaning no individual access to these tools at any one time. Only 10.8% indicated that they have individual access to farm tools and equipments whenever required. However, only 15% indicated to make use of these tools occasionally while 85% had never used then at all since form one. This is an indication that implementation of agriculture curriculum is no longer practical as indented but theory. In addition, of the 35 respondents who indicated have used the farm tools occasionally only 6 have used them for project work. This could be an indication that schools are still using agricultural teaching and learning resources to punish in disciplined learners. A study done in Mogotio Sub-county found out that such punishment negatively affects curriculum implementation by influencing learners' attitude towards the subject and the abused resources negatively (Cheplogoi, 2014).

Table 2. Adequacy and Frequency of use of School Farm

Sub-county	Adequacy of school farm			Frequency of use of school farm		
	Inadequate	Moderate	Adequate	Never	Occasionally	Frequently
Mogotio	9	0	48	57	0	0
Marigat	8	0	21	29	0	0
Kibwezi	26	0	88	114	0	0
Makindu	8	10	13	31	0	0
Narok-North	0	0	30	24	6	0
Total	51	10	200	255	06	0

Source: Survey data, Baringo, Makueni and Narok counties, 2016

Respondents were asked to rate the adequacy and frequency of use of their school farms. A whooping 200 respondents out of the 261 who have access to school farms said that it was adequate. This meant that land is not a hindrance to them when it comes to carrying out agricultural projects within the school. However, 255 out of 261 indicated never to have used the school farms for class room instruction purposes for the while they have been in their institutions. Again the practical aspect of agriculture subject is experiencing injustice in our learning institutions. Active involvement of learners in classroom

activities through project work in the school farm promotes co-operative learning and gives them the opportunity to apply their knowledge and skills to solve problems they face in the farm (Komba & Mwandanji, 2015; Waiganjo, *et al*., 2014). In an effort to clearly establish if project work is given enough attention in agriculture curriculum implementation, learners were asked to indicate how frequently their agriculture teacher involved them in project work either as a group or individually. The results were as shown in Table 3.

Over 97.8% of the respondents had never been involved in any project work within the school farm. This depicts the theoretical focus in the teaching of agriculture in our schools. These results obtained on frequency and use of farm tools as well as school farm are contrary to the expectation if learners are to acquire agricultural skills to make ASAL land agriculturally and economically productive since skills can only be acquired by doing.

Table 3. Learner Involvement in Agriculture Project Work

Frequency of involvement	Frequency	Percent
Never	265	97.8
Rarely	6	2.2
Oftenly	0	0
Very oftenly	0	0
Total	271	100.0

Source: Survey data, Baringo, Makueni and Narok counties, 2016

Learners therefore need the opportunity to carry out agricultural projects as part of the classroom instruction activities. The six respondents who had been involved in project work were requested to state the kind of project they were involved in and the results were as given in Figure 7 and Table 4.

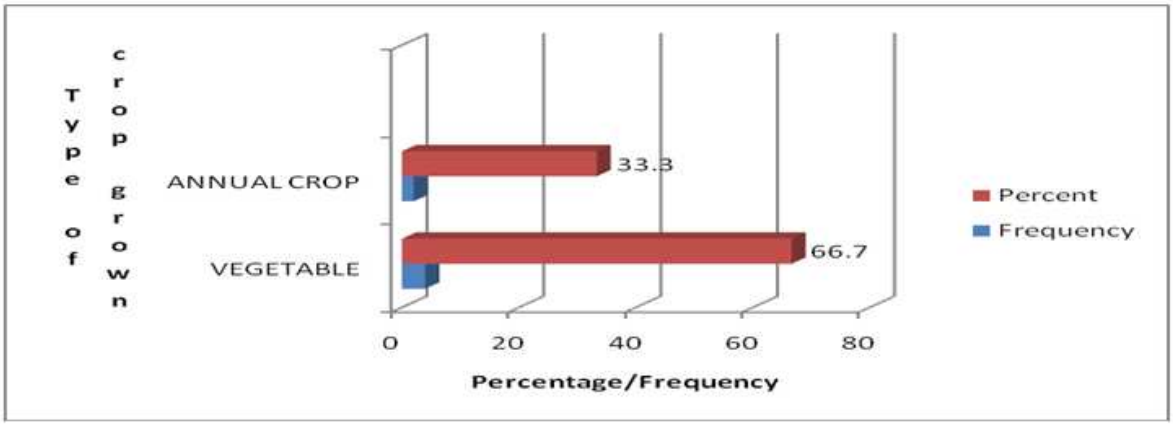

Figure 7: Type of crop grown during project work in school

Source: Survey data, Baringo, Makueni and Narok counties, 2016

Four of these respondents were involved in vegetable growing while the other two were involved in growing of annual crops. The projects sited are of relevance to their ecological conditions and are part of the projects that learners are expected to be exposed to during secondary school agriculture curriculum implementation.

Table 4. Type of Livestock Reared during the Project Work

Type of livestock reared	Frequency	Percent
None	3	50.0
Rabbit rearing	1	16.7
Other mammalian livestock	2	33.3
Total	6	100.0

Source: Survey data, Baringo, Makueni and Narok counties, 2016

Although all the six respondents were involved in crop growing, only three of them were involved in livestock rearing. The livestock reared were relevant as far as the curriculum implementation is concerned as well as the ecological conditions. Projects on livestock rearing seem not to be given emphasis yet livestock rearing is the highest income earner in ASALs. Learners need to get the appropriate skills in rearing and management of livestock if Kenya is to realize better returns from livestock in ASAL regions. Additionally it is important to note that these six respondents had joined the sampled school in Narok-North either in form Two or Three.

Adequacy and frequency of use of agriculture textbooks: Respondents in all the Sub-counties indicated to have access to textbook. However the level of adequacy varied but the books were frequently used at least during every lesson. In this study, books were to be adequate if the stipulation by the ministry of education was adhered to where the ratio of book sharing should be at least one book per two learners. Therefore, where one agriculture textbook was shared by two respondents or each has their own book the status was adequate. If the ratio was 1:3, moderate, whereas more than three respondents sharing a book were categorized as inadequate. Narok North recorded 100% satisfaction with the adequacy of books. However, there is need to improve on book ratio among the 97 respondents where the sharing is beyond the expectation since when learners have no sufficient access to learning materials curriculum implementation is slowed down (Okogu, 2011).

Adequacy and frequency of use of agriculture charts – Out of the 271 respondents only 58 had access to agriculture charts in their schools. However, across all the sub-counties they were rated as inadequate. It is important to note that although available and inadequate, respondents have never used them in the Sub-counties of Marigat and apart of Kibwezi. In Mogotio and Marigat they are occasionally used something that could be attributed to the fact that they are not enough to address at least every topic in the syllabus. All respondents from Makindu-Sub-county indicated unavailability of charts in their schools. This means that agriculture teachers need to go an extra mile and prepare teaching charts if the schools are unable to afford them. Charts break the monotony of class room instruction and teachers cannot afford to continue ignoring the fact that they need to diversify their teaching approaches if agriculture is to remain an interesting subject to learners.

Adequacy and frequency of irrigation equipments - Only 57 respondents had irrigation equipments in their schools. However more than half of them rated them as inadequate, ten rated them as moderately adequate while ten said they were adequate for their use. However, by form three third term, 52 of these respondents had never used these equipments in any way. Only five of the six respondents from Narok-North who had been involved in a project had made use of irrigation equipments. These being ASAL schools where rain is erratic and the weather are harsh, irrigation is paramount. For schools to invest in irrigation equipment is an indication that they have water sources for the same. However, it is worth to note that for these learners to acquire DLA practices they need to be involved in relevant learning projects and be able to make use of such equipments in school. Further probing made it clear that majority of the respondents' use these equipments once in form four and are managing the KCSE project. Curriculum implementation is a continuous process and therefore learners need to acquire knowledge and skills at each learning level.

Adequacy and frequency of use of agriculture videos: Only 3.6% of the respondents from Kibwezi Sub-County recorded availability of agriculture videos in their school. They also indicated to use them frequently as a learning resource. Videos are a learning resource that schools across the five Sub counties have not sufficiently invested in yet it makes learning interesting, breaks monotony and makes abstract concepts easy for learners to comprehend (Latir, Hamzah & Rashid, 2014).

4 CONCLUSIONS AND RECOMMENDATIONS

Agriculture curriculum implementation in ASAL secondary schools faces a serious challenge on availability of learning resources with all respondents lacking an agriculture workshop, agriculture laboratory and agriculture videos. This challenge is compounded by the inadequacy of the few that are available and their non-usage. Unavailability, inadequacy and non-use of all the learning resources except the agriculture text books compromise on the quality of agricultural skills and knowledge that these learners acquire at secondary school level.

This study recommends that teachers of agriculture need to be innovative and practical oriented in implementing the agriculture curriculum. There is need to reverse the theoretical teaching focussing on passing of examinations into building agricultural competency among learners by making use of the learning resources in their schools.

The government through the Ministry of Education, school administration, teachers of agriculture, county governments and all other stakeholders need to reconsider the strategies of implementing agriculture curriculum in secondary schools. There also need to review the relevancy of the teaching learning resources to reflect on the agricultural technologies and innovations that the society needs.

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