

Irony In The Teaching Of Agriculture In Kenya's Arid And Semi Arid Secondary Schools: The Students' And Teachers' Perspective

Kyule N. Miriam

Department of Agricultural Education and Extension,
Egerton University, Egerton- Kenya

Nkurumwa O. Agnes

Department of Agricultural Education and Extension,
Egerton University, Egerton - Kenya

Konyango, J. J. J. Ochieng

Department of Agricultural Education and Extension,
Machakos University College, Machakos-Kenya

Abstract: Effective teaching of agriculture depends partly on choice and use of appropriate teaching method. The method chosen should promote practical agricultural activities targeting most learning senses. Agriculture subject in secondary schools was meant to be vocational, equipping learners with skills and knowledge for participation in agricultural development. Its teaching in schools is expected to enable learners develop principles of agricultural production relevant to Kenya in general and specifically to their own environments. The schools as curriculum implementation centers should take an active part in national development through agricultural activities. However, ASALs have persistently remained agriculturally underdeveloped besides the role played by teaching of agriculture in these areas. This study thus sought to determine the methods used by teachers in teaching agriculture in ASAL schools. The study was carried out in ASAL counties of Baringo, Makueni and Narok. From the results it was clear that teachers leaned more on lecture and discussion methods and never involved learners in practical agriculture which would boost skill acquisition for self reliance in the society. Data from the teachers themselves indicated that they used more of projects, demonstrations and discussion. This meant that teachers knew the appropriate methods to use in implementing the curriculum practically but they didn't put them into use. The study recommends that there is need for agriculture teachers to embrace participatory teaching methods that promote knowledge and skill acquisition among the learners if ASALs are to benefit from curriculum implementation in secondary schools.

Keywords: Irony, Teaching, Agriculture, Secondary Schools, Arid and Semi Arid Counties

I. INTRODUCTION

The two fundamental objectives of teaching agriculture in secondary schools are to develop basic principles of agricultural production relevant to Kenya in general and specifically to learner's own environment as well as involve learners in practicals which aim at assisting them to acquire useful agricultural skills (KIE, 2002). The agriculture curriculum thus acknowledges that Kenya is not a uniform agro-ecological zone hence faces varying agricultural needs and challenges. ASALs are characterized by inadequate rainfall and high temperatures which are crucial ecological

factors affecting agricultural production (Meybeck & Gitz, 2013). This then calls for implementation of the curriculum in ASAL schools to emphasize on agricultural practices aimed at promoting DLA for improved agricultural production in ASALs.

The teaching methods used by agriculture teachers influence agriculture curriculum implementation in ASAL schools. According to Primrose and Alexander (2013), teacher's choice of a teaching method to use depends on their technical knowhow and nature of content. Some of the methods used include; problem based, context based, student centered, demonstration, project, lecture, tutorial and

seminars, fieldwork, inquiry method, discussion and computer based method (Ali & Muhammad, 2012; Okogu, 2011; Olatoye & Adekayo, 2010; Wootoyitidde, 2010). A study done in Nigeria indicated that most teaching methods and approaches used by teachers encourage rote learning, memorization and regurgitation of facts (Ali & Muhammad, 2012). The Kenyan situation is not any different with agriculture teachers having deviated from the practical to theoretical teaching of the subject. This should not be the case since agriculture teaching should emphasize experiential learning. To promote improved agricultural production in ASALs agriculture teachers need to expose students to agricultural practices that promote DLA. A teacher should choose a teaching method that is flexible and able to broaden and develop learners' critical thinking (Okogu, 2011). Past studies have shown that using active methods of teaching fosters critical thinking, creative thinking and collaborative problem solving which are very crucial in agricultural education (Olatoye & Adekayo, 2010). Such methods are very appropriate when teaching agricultural practices that promote DLA if these practices are to enhance agricultural production in ASALs.

A study by Olatoye and Adekayo (2010) found out that project based method challenged students to learn and work cooperatively in groups to seek solutions to the real world. Agriculture being a technical subject, teachers have no option but embrace project method to enable students acquire the technical skills through experience. Although the secondary school agriculture syllabus suggests several projects for learners in their four year course, there is need to establish whether teachers implement these projects in their schools. Involvement of learners in agricultural activities through project exposes them to long lasting experiences and assists them think critically enhancing learning and retention. Carrying out agricultural projects aimed at promoting DLA in school project work like growing of vegetable seedlings on sunken beds, rearing adaptable livestock among others would equip learners with skills they would apply to promote agricultural production in ASALs. Agriculture teachers are thus expected to focus and direct their teaching effort towards teaching methods that promote acquisition of skills, attitudes and work-related knowledge among their learners.

The teaching method used by a teacher will also be influenced by the time allocated to the subject in question. Agriculture curriculum implementation is also time demanding as Thobega, Subair, Mabusa and Rammolai (2011), found out that agriculture teachers needed more time to schedule their students into agricultural projects and demonstration work as well as regular monitoring for effective learning. Looking at time allocation for the subject among the Six first schools back in 1963, time allocation ranged from 3-5 lessons a week from form one to four. However, during week days agriculture was allocated extra time early in the morning or late in the evening across all the schools as well as Saturdays. This gave teachers enough time to implement the practical agriculture curriculum which favoured DLA skill acquisition among learners.

However, reforms in the curriculum over time have seen a decline in time allocation for agriculture in the school timetable which currently stands at three and four lessons in

the lower and upper classes respectively (KIE, 2006). The time allocation currently favours the compulsory subject at the expense of technical subjects agriculture included. In addition timetabling of double lessons for technical subjects was also scrapped which leaves an agriculture teacher time constrained in implementing agriculture curriculum practically. The reforms that were done on the agriculture curriculum in 2002 failed to factor the time limitations teachers experience when implementing the curriculum. Reducing time allocation for the subject hinders practical teaching of the subject and hence influencing DLA skill acquisition in ASAL schools.

According to Reche, Bundi, Riungu & Mbugua, (2012), agriculture is dynamic and therefore agriculture teachers need regular in-service training, workshops and seminars to keep abreast with any new information in their area of specialization to enhance curriculum implementation. While curriculum implementation process is complex, teacher professionalism and competence also influences its implementation (Skopje, 2013). Thus agriculture teachers' ability to interpret agriculture curriculum objectives to their local environment would enhance learning. Ofoha, Uchegbu, Anyikwa & Nkemdirim, (2009), established that when teaching and learning addresses the learners needs, there is a high tendency to ensure that they fully understand the material being taught. They also insisted that a teacher's focus should be on how the learner understands; what meaning he makes of his understanding and whether he can apply the knowledge and meaning in real-world situations. Agriculture teachers are very critical in agriculture curriculum implementation and therefore their full commitment in teaching of agricultural practices and techniques that promote DLA curriculum is essential if the agricultural potential in ASALs is to be fully exploited.

Teachers also gauge acquisition of knowledge, skills and techniques in agriculture through assessment of what has been taught. A research by Napoli and Raymond (2004) found out that students have a trend of focusing their study on content that is examinable. It also established that most assessments focus on low order types of outcomes instead of the higher order types which inculcate acquisition and application of skills and knowledge in technical subjects like agriculture. Agriculture examination paper administered under East African Examination Council back in 1969 was more practical oriented with the written paper and continuous assessment test accounting for 65% and 35% respectively. The written paper emphasizing the principles and the practical applications of principles in relation to the areas of coverage which included general agriculture, farm structures, farm machinery, agricultural economics, crop production and animal production. The format of the continuous assessment test comprised of three sections namely a) identification tests where students were expected to identify a wide range of plant and animal materials b) Projects where every student would carry out and write a detailed report on one practical animal project, and one practical crop project c) Farm diary where every student would keep a comprehensive farm diary on all aspects of the work of the school farm which would be continuously assessed and marked by the teacher. The dairy with marks would then be send to E.A.E.C.

This examination format was very practical and learners could be assessed on their level of skill acquisition on different agricultural practices promoting DLA on all areas in the curriculum then. This format of assessment required teachers to have implemented the curriculum practically. Agriculture must be given a prominent place in the school curriculum and must be made attractive to both learners and their programmes. It should be designed in such a way that it plays an important role in changing the attitudes of the learners in agriculture to enable them function effectively in promoting agricultural development in their communities.

Reforms in the examination format of agriculture subject saw the Kenya National Examination Council (KNEC) remove the practical examination paper in 2002. This has influenced the practical teaching of agriculture hampering skill acquisition on practices promoting DLA in ASALs. Subsequently KNEC also degraded the project paper thus the examination system emphasizes on theory rather than practical aspects especially for agriculture subject (Cheplogoi, 2011; Nyang'au, Kibett & Ngesa, 2011). Assessment of agriculture as a subject needs to be more practical oriented besides the project paper given. This is to ensure that teachers emphasize on practical aspects in the curriculum which will be the only way to attain the fundamental objective of involving learners in practicals to assist them acquire useful agricultural skills. The emphasis given to project work in agriculture needs to be improved in the examination system to improve agricultural skill acquisition. Acquisition of agricultural skills to perform agricultural practices that promote DLA will go a long way in preparing the learners for gainful employment, further studies as well as promoting agricultural production in ASALs.

While curriculum implementation process is complex, teacher professionalism and competence influences its implementation (Skopje, 2013). Thus agriculture teachers' ability to interpret agriculture curriculum objectives to their local environment would enhance learning. Effective curriculum implementation requires that learners learn by doing (Konyango & Asienyo, 2015; Waiganjo, Wambugu, Ngesa & Cheplogoi, 2014). To create conducive environment for learning by doing, teaching and learning should be directed towards the needs of the learner as it promotes their understanding. A teacher's focus should be on how the learners understand, what meaning they make of their understanding and whether they can apply the knowledge and meaning in real-world situations. Agriculture teachers are very critical in agriculture curriculum implementation and therefore their full commitment in teaching of agricultural practices and techniques that promote DLA curriculum is essential if the agricultural potential in ASALs is to be fully exploited. This study sought to document the teaching methods used by teachers of agriculture in implementing the curriculum in ASAL schools.

II. 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 150 teacher of agriculture and 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 88 and 271 teachers and form three agriculture students respectively.

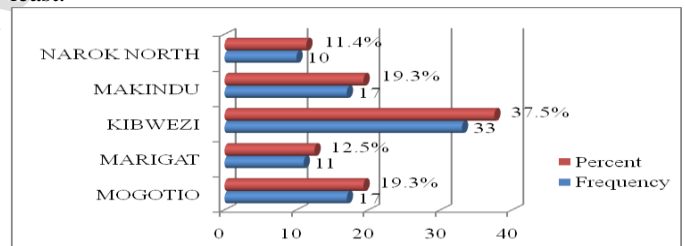
Both qualitative and quantitative data were collected using semi-structured questionnaires from both teachers of agriculture and form three agriculture students. They were analyzed using SPSS. Simple descriptive statistics mainly frequencies, percentages and charts were used to present data on the general characteristics and the teaching methods used.

III. RESULTS AND DISCUSSIONS

A total of 271 form three agriculture students participated in this study comprising of 58.7% male and 41.3% female while a total of 88 agriculture teachers participated and their characteristics are as discussed below.

A. CHARACTERISTICS OF AGRICULTURE TEACHERS

The distribution of the teacher respondents per Sub-county was as shown in figure 1. Kibwezi Sub-county had the highest percentage proportion while Narok North had the least.

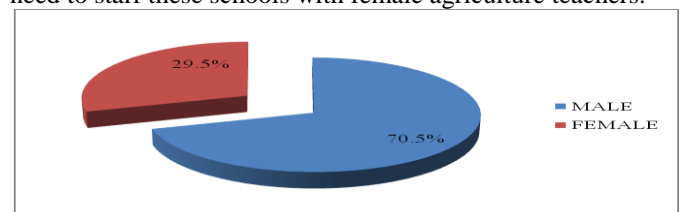


Source: Survey data, Baringo, Makueni and Narok counties, 2016

Figure 1: Agriculture teachers' distribution per Sub County

Characteristics that were investigated included: gender, age, teaching load, among others.

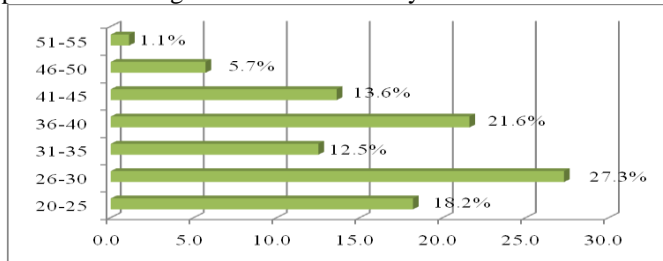
GENDER OF THE RESPONDENTS: Male teachers dominate the teaching personnel handling the subject in the ASAL counties. The lower proportion of female teachers and only in very few schools could be denying the female students a role model to emulate in the area of agriculture. Thus there is need to staff these schools with female agriculture teachers.



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

Figure 2: Gender of the respondents

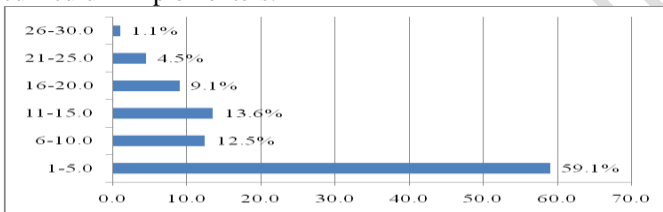
AGE OF THE RESPONDENTS: The age ranged between 20 and 54 years with the average age being 34 years. The results in figure 24 indicate that 58% of the teachers in the ASAL counties are below the age of 35 years and hence categorised as youth. Since the youth are the most productive age group, it is expected that these teachers are very committed in implementing the agriculture curriculum effectively in the ASAL schools. However, teachers within the age bracket of over 46 years to 55 were only 6.8% hence this is a subject that is being handled by teachers who are still very productive in regard to service delivery.



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

Figure 3: Age of the respondents

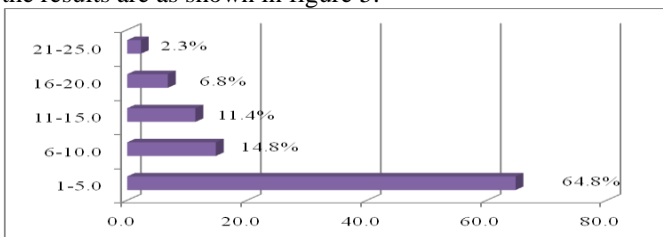
LENGTH OF TEACHING AGRICULTURE IN SECONDARY SCHOOLS: The results clearly indicate that more than half of the subject teachers in these counties have less than five years teaching experience. Those with the wealth of teaching experience of over 20 years are only 5.6%. The young or new teachers in the profession could be lacking mentorship into the implementation of agriculture curriculum since there is a lot that a teacher acquires through experience and there is need to pass it to the young generation of curriculum implementers.



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

Figure 4: Number of years respondents have taught agriculture in secondary schools

LENGTH OF TEACHING AGRICULTURE IN ASAL SECONDARY SCHOOLS: Respondents were asked to indicate how long they had taught agriculture in an ASAL school and the results are as shown in figure 5.

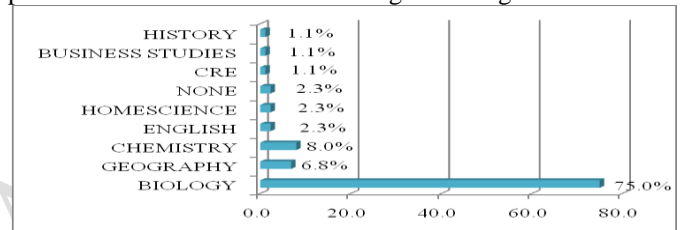


Source: Survey data, Baringo, Makueni and Narok counties, 2016

Figure 5: Number of years respondents have taught agriculture in ASAL secondary school

Close to 65% of all the teachers implementing the curriculum in ASAL counties have less than five years of experience. Worth noting is that the percentage retention of teachers with years of experience decline drastically. This could be associated with massive transfer of teachers to areas that are ecologically friendly or even the fact that most of these teachers are employed by the schools on temporary basis and therefore move out whenever they get better jobs or working conditions elsewhere. There is need therefore to devise mechanism that will enhance teacher retention in ASAL schools so that curriculum implementation can be enhanced through teaching experience.

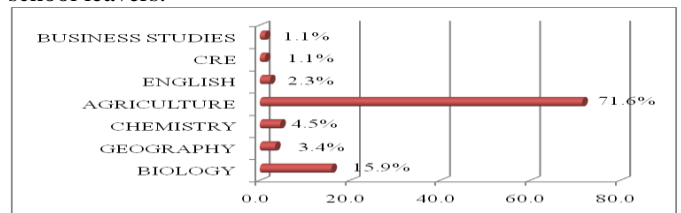
TEACHING LOAD: The teaching load among the respondents ranged from 10-32 lessons per week. 83% of them had the maximum load of 27 lessons per week and below while the remaining percentage exceeded the maximum load. Past studies have found out that high teaching load negatively affects curriculum implementation hence there is need to ensure that teachers have manageable teaching load (Cheplogoi, 2014). Respondents were asked to identify their other teaching subject as well as the teaching subject they preferred most. The results were as given in figure 6 and 7.



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

Figure 6: The second teaching subject besides agriculture

Most of the respondents had biology as their other teaching subject although 2.3% of the respondents had agriculture as their only teaching subject. Since biology is a science that is closely related to agriculture subject, it is expected these teachers are very efficient in teaching of agriculture which should translate to competency among school leavers.



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

Figure 7: The most preferred teaching subject

However on subject of preference, 71.6% preferred teaching agriculture and only 28.4% preferred their other teaching subject. These results contradict those of Konyango & Asienyo, (2015) that most of the teachers teaching agriculture have no preference for the subject. Thus teachers' preference for the subject may not be major reason for ineffective agriculture curriculum in ASAL schools.

METHODS USED IN CURRICULUM IMPLEMENTATION: Teaching is the process of facilitating learning. It involves the transfer of ideas, knowledge, skills, attitudes, beliefs and feelings to a learner, with the aim of

bringing about particular changes in them. Past studies have indicated that the method of teaching a teacher uses can influence learners' ability to learn hence influencing curriculum implementation. In order to be effective in teaching, teachers need to vary their teaching approaches, be dynamic and vigilant in gauging how learners respond to their teaching style. Learner respondents were guided into the different teaching methods commonly used in the teaching of agriculture and requested to rate how oftenly their agriculture teacher used each. The teachers were also asked to indicate how frequently they used each of the teaching methods. The results were as shown in Table 1. In the 1st column (Respondents), L represents Learners while Tr represents results from teachers of agriculture.

Frequency of use		Percentage proportion of using different teaching methods							
		Lecture	Discussion	Practicals	Demonstration	Projects	Field visits	Resource persons	Computer based instruction
L	Never	11.1	14	91.9	72.7	97.7	73.8	92.6	96.3
Tr		15.9	1.1	5.5	2.3	5.7	13.6	29.5	69.3
L	Occasionally	25.5	41	8.1	27.3	2.21	26.2	7.4	3.7
Tr		52.3	34.1	67.0	56.8	79.5	79.5	65.9	28.4
L	Frequently	63.5	45	0	0	0	0	0	0
Tr		31.8	64.8	27.3	40.9	14.8	6.8	4.5	2.3

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

Table 1: Respondents' Rating of the Teaching Methods used by their Teachers of Agriculture

From the learners' responses, lecture and discussion methods as the most commonly used with most teachers lecturing while less than half frequently used the discussion method. Practical, demonstrations, projects, field visits, use of resource persons and computer based instruction are not popular among agriculture teachers in ASALs. Past studies have shown that the method of teaching that a teacher uses influences the manner in which a curriculum is implemented. Methods that promote theoretical teaching enhance rote learning at the expense of agricultural skill acquisition (Waiganjo, et. al., 2014). Methods that make learners passive don't give them the opportunity to practice their knowledge and skills in problem solving and thus rarely gain agricultural problem solving skills. This then translates to school leavers who have studied agriculture in secondary schools but are unable to participate in agricultural development. Although computer based instruction has been found to enhance learners motivation in active learning and consequently boosting agriculture curriculum implementation (Muchiri, Barchok & Kathuri, 2015), only 3.7% of the respondents are occasionally exposed to this method of instruction. This being a digital era and agricultural information is only a click away; there is need for teachers of agriculture to implement the agriculture curriculum in ways that meet the learners' expectations as digital natives. Theoretical teaching has made agriculture fail to make an impression in the ASAL areas.

A study done by Okogu (2011) indicated that use of active methods of teaching like projects, practical, demonstrations and field visits encourages creative thinking and acquisition of problem solving skills. Thus the occasional

use of such methods in implementing agriculture curriculum in ASALs would equip learners with the relevant skills and knowledge that promote DLA. A good teacher should be able to identify those critical agricultural skills that learners must acquire to make individual progress and function proficiently in the society after school. Teachers in ASALs need to emphasize on DLA skills that will enable learners exploit the ASALs agriculturally. Failure to focus on such skills makes most youths feel inadequate and instead of taking up agriculture as an investment, they move to the urban centers to look for jobs. Thus the teaching methods employed by agriculture teachers should be those that motivate learners to learn by doing for them to acquire the necessary skills in agricultural production (Muchiri, et al., 2015).

However, the teachers' responses reveal otherwise contradicting the learners' responses to a large extent. Their results indicate that discussion and demonstration methods are the most frequently used at 64.8% and 40.9% respectively. Although over half of the teacher respondents indicate to use practical, demonstration, project, field visits and use of resource persons occasionally, further triangulation results contradict this. Learners were asked to indicate how frequently their agriculture teacher involved them in project work either individually or in a group and the results were as presented below:

Frequency of involvement	Frequency	Percent
Never	265	97.8
Rarely	6	2.2
Oftenly	0	0
Very oftenly	0	0
Total	271	100

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

Table 2: Learner Involvement in Agriculture Project Work

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 are contrary to the expectation if learners are to acquire agricultural skills to make ASAL land agriculturally and economically productive. This is because skills can only be acquired by doing hence learners need the opportunity to carry out agricultural projects as part of the classroom instruction activities.

However, from the teachers' responses on how frequently they used the teaching methods it is clear that they knew the most appropriate ones to use while implementing agriculture curriculum in ASALs. Unfortunately they never use them and this influences the quality of practical skills and knowledge acquired by learners in ASAL schools. This could partly explain the reason as to why ASALs have not benefited from secondary school agriculture curriculum implementation.

IV. CONCLUSIONS AND RECOMMENDATIONS

Agriculture curriculum implementation in ASAL secondary schools faces injustice with teachers holding onto teaching methods that encourage rote learning at the expense of practical implementation of the curriculum

The study recommends that there is need for agriculture teachers to embrace participatory teaching methods that promote knowledge and skill acquisition among the learners if ASALs are to benefit from curriculum implementation in secondary schools.

The government through the Ministry of Education and training institutions need to reconsider the training of teachers so that emphasis is put on competence acquisition. This will promote their efficiency in using the same in teaching of agriculture in secondary schools.

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