

Research Article

Stakeholders' Opinions on Inadequate Implementation of Agricultural Science Curriculum in Ordinary Level Secondary Schools in Arusha District, Tanzania

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Abstract

Despite agriculture being among the science subjects in the lower secondary school curriculum in Tanzania, its implementation has been very low in many secondary schools. This study therefore sought to analyse the opinions of potential stakeholders on inadequate implementation of the agriculture curriculum in selected secondary schools within the Arusha District Council in Tanzania. Two research questions guided this research: (i) To what extent are selected determinants hindering the implementation of the agriculture curriculum in secondary schools? (ii) What are the perceptions of stakeholders on the importance of the agriculture curriculum in schools? The population of the study was 56 secondary schools in the Arusha District Council from which the researcher sampled six schools, six heads of schools, six academic masters/mistresses, 51 teachers, and 149 students making a total of 210 participants. The research employed a convergent method research design under a mixed methods approach. The researcher went to the field in person and used questionnaires and interview guides for data collection. The study used frequencies, percentages, and a Chi-square test for quantitative data analysis and thematic analysis as well as narrations for qualitative data analysis. The researcher observed ethical principles in all stages of this study development. Results show that the main hindrance of the agriculture curriculum implementation is primarily due to the lack of teachers followed by inadequate agricultural teaching and learning resources. The research also found that all the stakeholders perceive the agriculture curriculum as very important. Hypothesis testing using a Chi-square test showed a significant difference in preference of agriculture as compulsory or optional depending on categorization of respondents as students or teachers. This research concludes that it is only when an adequate number of agriculture teachers and resources are available that the subject can be adequately implemented in secondary schools. The researcher recommends increasing advocacy for agriculture in schools and the inclusion of agriculture courses in teacher training programmes in colleges and universities.

Keywords

Agriculture, Curriculum, Implementation, Stakeholders, Arusha District Council, Secondary Schools, Tanzania

1. Introduction

Access to relevant agricultural information is important for youth to receive an orientation to agriculture. When con-

necting youth with agriculture, the Food and Agriculture Organization of the United Nations [FAO] [1] mentions that

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the principal challenge is the youths' limited access to knowledge, information, and education, including agricultural courses in schools. Poor and inadequate education limits the acquisition of skills and productivity. Thus, the FAO urges that agricultural education and training must be adopted by schools to ensure that graduates have skills that meet the needs of the labour market. The importance of agriculture as a subject is recognized in various countries and, hence, incorporated in the school curriculum. In India, agriculture has been integrated in the school curriculum to equip the youth with necessary knowledge and skills to become responsible, proactive, and self-reliant individuals, thereby making valuable contributions to the overall economy of the country [2].

A study by [3] in a Tanzanian context to assess whether introducing agricultural education and its objectives in agriculture-supportive secondary schools were realized. The study involved former school graduates (1983-1993). The findings showed that the majority of the graduates joined tertiary agricultural institutions, and about 67.4 percent were employed as service providers in agricultural roles in various sectors. Results also indicated that the respondents had a positive attitude towards agricultural education. The authors concluded that the implementation of agricultural education at the secondary school level contributes positively toward developing human capital for agriculture.

Despite the Tanzanian economy depending largely on agriculture, the implementation of an agricultural curriculum is not available in many secondary schools throughout the country. Yet, the country needs youth to engage in agricultural production for enhanced productivity and job creation. According to The United Republic of Tanzania, agriculture is a main contributor of employment in Tanzania, as it accounts for 67 percent of employment [4]. Furthermore, [5], recommend for interventions to promote youth participation in Agriculture in Tanzania through educational programmes that equip young people with foundational skills.

However, most of the youth are unemployed or underemployed, as there is a low engagement of youth in agriculture. In response to this situation, the Government of Tanzania recently initiated the Building a Better Tomorrow-Youth Agribusiness Initiatives (BBT-YAI) programme as a way of enhancing agribusiness skills among the youth [6]. The BBT-YAI programme is providing selected youth training in agricultural and entrepreneurial skills (agribusiness). If most of the youth were taught agricultural skills in schools, the government would not have invested as many resources in their training, but rather, the government would focus on creating markets for the youth. Scholars, [3] urge that having agricultural education in secondary school contributes positively toward developing agricultural human capital. Currently, agriculture subjects are not implemented in most secondary schools in the Arusha District Council. Based on the NECTA database [7], of the 56 secondary schools in the Arusha District Council, only 1 (1.8 percent) is teaching agriculture. This is despite the statement in the secondary edu-

cation curriculum that the subject shall be taught in secondary schools in Tanzania (Tanzania Institute of Education [TIE] [8]).

This study, therefore, explored the reasons behind the grossly inadequate implementation of the agriculture curriculum in secondary schools in the study area of the Arusha District Council. The study was to answer two research questions: (i) To what extent are selected factors hindering the implementation of the agriculture curriculum in secondary schools? (ii) What are the perceptions of stakeholders on the importance of the agriculture curriculum in schools? The researcher tested the following hypothesis: "There is no significant difference in preference of agriculture subject as compulsory or optional between students and teachers".

2. Literature Review

The incorporation of agriculture in a school curriculum depends on how the administrators perceive the subject being implemented. This section, therefore, presents a review of the related literature in relation to the importance of agriculture as perceived by potential stakeholders. The review also focuses on the barriers to successful implementation of agricultural skills in various school levels.

In a developed country's context, [9] assessed the acceptance of incorporating agriculture into an elementary school curriculum in Washoe County district of The United States of America. The study involved 407 teachers from kindergarten through the sixth grade. Data collection was done using questionnaires. The results of that study indicated that the teachers perceive agriculture education as important and they would be interested in learning more about incorporating it into their curriculum. However, most of the respondent teachers were not currently implementing agriculture in their classrooms. The authors recommended for increased marketing of agriculture education and connection with teachers' preparation programme. The study was a purely quantitative survey involving teachers only leaving out students who are potential stakeholders.

Linking the importance of agriculture to an educational context in India, [2] give several reasons for incorporating agricultural discipline in schools. These include food security, essential nutritional knowledge, awareness about sustainable production, knowledge about basic survival skills, and life skills. Other reasons are that it encourages responsible consumption and career choices in agriculture. According to [10], agriculture in Africa lacks people with the needed skills to perform efficiently. The reason behind the missing skills are: lack of formal and informal training institutions and centers, lack of business orientation in African farming sectors, and lack of information on the true potential of agriculture. In Zimbabwe, [11] carried out a study to investigate challenges facing the introduction of agricultural subjects in primary schools. It was found that most teachers did not study agriculture in high school or at teachers' training colleges. Thus,

they did not have the competencies to teach agriculture in schools.

In Uganda, [12] carried out a study on the influences for and barriers to agricultural education curriculum adoption by Ugandan secondary school teachers. The data collection was accomplished through interviewing eight teachers. The findings revealed two themes: (i) the shift from theoretical to practical applications and (ii) barriers. The first theme was supported by sub-themes such as: practical application, allowing students to think critically, inclusion of all types of learners, teacher-centered to learner-centered learning, assessment, and community engagement. For the barriers theme, the sub-themes included: lack of resources, additional training needed for teachers, support needed from school, and support needed from outside agencies. That study revealed the practical outcomes of teaching the subject for the students. However, the study was purely qualitative, using only interviews for data collection. The perspectives of other potential stakeholders were not included. The current study triangulated research instruments and sources.

In Kenyan context, [13] evaluated the role of parents and teachers in students' choices of agriculture as a subject in Kisii and Nyamira Counties, Kenya. A descriptive survey design was applied, and the participants were principals, teachers, and students taking agricultural courses. The results of this study showed that most students choose agriculture since they consider it a booster to raise their grades compared to other technical subjects. It was further found that continuing to study agriculture subject was influenced by the students' performance in the subject more than the influences from parents and teachers. The findings of that study implied that agriculture subjects are beneficial as perceived by the learners. In the same country context, [14] sought to find out the impact of studying agriculture at the secondary school level on agricultural productivity in Kahavahkolo sub-county of Kakamega County, Kenya. The study employed a correlational design. The study participants included 422 farmers who were women. Data was collected using questionnaires and focus group discussions. The results showed that 80.5 percent of the women who completed secondary school with agricultural studies were involved in agricultural production. It was, thus, established that learning agriculture at school had a positive impact on farmers' productivity. Those results demonstrate that the learning of agricultural skills at school has a long-term affect for the school's graduates. Furthermore, [16] explored the types and quantities of resources available for teaching agriculture in Kakamega Central sub-county, Kenya. The study was motivated by the decline in enrollment and performance in the subject. The findings revealed that the schools lacked the requisite teaching and learning resources for an agriculture curriculum.

Nevertheless, [11] investigated the challenges facing the introduction of agricultural science in primary schools in Zimbabwe. The urban schools were involved in the study, and data were collected using open-ended questionnaires. The

researchers found that the schools were challenged due to lack of human and material resources. A study by [16] established that in the current Tanzanian generation, most youth (considered as future farmers) have negative attitudes towards agriculture despite it being the backbone of the country's economy and offering opportunities for employment. The negative attitude is exacerbated by the fact that agriculture is no longer part of the standard school curriculum. However, according to [17], agriculture offers more than 65 percent employment of Tanzanian population. Also, [19] did a study in secondary schools in the Kilimanjaro region and found that majority of the schools offer agriculture subjects, focusing on farming practices and livestock keeping. However, the subject is not examined by the National Examination Council of Tanzania (NECTA) in the schools studied. Other challenges included: the difficulty for teachers in preparing practical skill activities, inadequate qualified teachers, and inadequate practical skill facilities. Thus, [18] recommended that agriculture, among other practical subjects, be made compulsory in the secondary education curriculum in Tanzania.

Furthermore, [19] conducted a study to investigate the effectiveness of teaching/learning of agricultural science subjects in selected ordinary level secondary schools in Tanzania. The study involved 100 students, 20 agriculture teachers, and 16 key informants. Data was collected using questionnaires, the researcher's diary, and checklists. The results showed that the implementation of an agriculture curriculum was far from the intended learning outcomes of the curriculum, and the weak implementation was attributed to a shortage of human and non-human resources for the subject.

Reviews of related studies have shown that governmental leaders in many developed and developing countries consider agriculture as key for economic transformation. Literature also shows that there is a positive relationship between learning agriculture in school and engaging in effective agricultural production in one's career. However, there is lack of information in the literature about the factors influencing an effective implementation of an agriculture curriculum in ordinary level secondary schools in Arusha District Council. The perceptions of key stakeholders like students, teachers, and school administrators about the importance of agricultural skills in contemporary Tanzania were not explored by previous studies in a Tanzanian context. The current study, therefore, contributes to filling this lacuna.

3. Material and Methods

3.1. Research Design

This study employed a convergent mixed methods design under a mixed method research approach. This is because both qualitative and quantitative data were collected, interpreted, and compared in attempt to understand the phenomenon under investigation. According to [20], the intent of convergent mixed methods design is to compare results

from qualitative databases with those from quantitative databases to see if the findings converge (match) or diverge, mutually support a construct, or validate one form of data with another.

3.2. Population

A total of 56 ordinary level secondary schools in Arusha District Council formed the population of the study. Teachers, students, heads of schools, and academic masters/mistresses in Arusha District Council were the research participants in this study.

3.3. Sample and Sampling Techniques

The researcher first sampled the schools using stratified sampling techniques to ensure the inclusion of both private and public ordinary level secondary schools in the sample involving (6) secondary schools. He then sampled 51 teachers using stratified-random sampling based on subject clusters (science, arts, and commerce). Also, the researcher selected six (6) heads of schools and six (6) academic masters/mistresses using purposive sampling method on basis their central role in supervising curriculum implementation in schools. He used stratified sampling to select 149 students on the basis of gender and class level. The study, therefore, had 210 total research participants.

3.4. Research Instruments

The researcher collected data using questionnaires from teachers and students and interview guides for heads of schools and academic masters/mistresses. The researcher validated the research tools through expert reviewers, and the study was piloted for reliability testing. Comments of the reviewers and pilot findings were used to fine-tune the instruments before administration to main study.

3.5. Data Analysis Procedure

The researcher used descriptive statistics, such as frequencies and percentages, and a Chi-square inferential test of independence for analysis of quantitative data from the closed-ended items of the questionnaires. He employed thematic analysis and narrations to analyze the qualitative data from interviews and open-ended items of the questionnaire.

3.6. Ethical Considerations

The researcher adhered to ethical principles in conducting the study. The researcher sought formal approval from the district administration and school authorities for data collect in schools. He then explained the purpose of the study to all the categories of respondents and the participation was based on one's willingness (informed consent). The researcher

involved only the participants who agreed to be part of this study. There was not any intimidation imposed by the researcher to any of the participants who declined to participate in the study. The researcher collected data only at convenient times of the participants without disturbing the teaching/learning schedules. The schools which decided not to continue with the study were withdrawn without any consequences. The researcher treated the collected data confidentially and the research tools did not require the mentioning of respondents' names (responses were anonymous). The results of this study are being used only for academic purposes. The researcher presented the results honestly.

4. Results

This section presents the results of the study. The first part gives the background data of the participants, and the secondary part gives the results and discussion in line with the objectives of the study. The conclusions and recommendations are also provided.

4.1. Students Demographic Data

Students who participated in this study were from different class levels of secondary education as shown in Table 1.

Table 1. Categorization of students by class level.

Class Level	Frequency	Percentage
Form Two	49	32.9
Form Three	49	32.9
Form Four	51	34.2
Total	149	100

Table 1 shows that the classes involved in the study were Form Twos, Threes, and Fours. The selection represents the classes nearly equally. The students were selected from both public and private secondary schools as shown in Table 2.

Table 2. Students' categorization by school type.

School type	Frequency	Percentage
Public	93	62.4
Private	56	37.6
Total	149	100

Table 3. Students' gender.

School type	Frequency	Percentage
Male	76	51.0
Female	73	49.0
Total	149	100

The students were nearly equally represented by gender.

4.2. Teachers' Demographic Data

The teachers who participated in this study were from different groups categorized by subject as shown in Table 4.

Table 4. Teachers' subject cluster.

Subject cluster	Frequency	Percentage
Arts	27	52.9
Science	21	41.2
Commerce	3	5.9
Total	51	100

The data indicates that a majority of teachers (over 50 percent) belong to the arts subject cluster in the studied secondary schools. Teachers were asked to provide information on whether they studied agriculture in teacher training pre-service programme. Table 5 has the responses.

Table 5. Teachers' training in Agriculture subject in pre-service programme.

Response	Frequency	Percentage
Yes	3	6.8
No	41	93.2

Response	Frequency	Percentage
Total	44	100

The data in Table 5 indicates that the majority of teachers (93.2 percent) in the schools did not take agriculture as a subject in teacher training education. This is an indication that the subject specialists are few in the teacher education programme.

4.3. Factors for the Implementation of the Agriculture Curriculum in Secondary Schools

The researcher asked the first question to students whether they study the subject of agriculture in the schools. The answers are provided in Table 6.

Table 6. Students' responses on whether they study agriculture as a subject.

Response	Frequency	Percentage
Yes	25	23.8
No	119	82.6
Total	144	100

The data in Table 6 show that the majority of students (82.6 percent) do not study agriculture as a subject and, hence, they are lacking agricultural skills. The implement of an agriculture curriculum is very low in the schools studied. Of the schools involved in this study, only one is implementing the agriculture curriculum.

The researcher further posed a question on extent to which selected factors (teachers, resources, and students' interests) hinder effective implementation of agriculture as a subject in schools. The responses given by students are provided Table 7.

Table 7. Students' responses on the extent to which different factors hinder agriculture as a subject.

Factors	Large extent		Some extent		Very little extent	
	f	percent	f	percent	f	percent
Lack of teachers (n=116)	104	89.78	8	6.9	4	3.4
Lack of teaching material resources (n=107)	53	49.5	43	40.6	11	10.3
Lack of interest by students (n=103)	13	12.6	20	19.4	70	68

The researcher further sought the views of teachers about extent to which different factors hinder the implementation of agriculture as a subject in secondary schools. The teachers gave responses as shown in Table 8.

Table 8. Teachers' responses on the extent to which factors hinder agriculture as a subject.

Factors	Large extent		Some extent		Very little extent	
	f	percent	f	percent	f	percent
Lack of teachers (n=41)	36	87.8	3	7.3	2	4.9
lack of teaching material resources (n=40)	27	67.5	7	17.5	6	15
lack of interest by students (n=34)	3	8.8	7	20.6	24	70.6

The data in Table 7 and Table 8 identify the students' and teachers' responses respectively, and they demonstrate that the lack of teachers is the leading factor hindering the implementation of the agriculture curriculum followed by a lack of agricultural teaching/learning resources and facilities. Thus, the current generation in schools continues to lack agricultural knowledge and skills which are very relevant in the country.

Data from interviews also supports these results. When asked the question, "Why is the agriculture curriculum not implemented in their school?" One research participant said:

I do not know...may be because the school is in town though environment allows the teaching of agriculture. Agriculture subject is not promising, and it has very few teachers because they are not prepared from the grass root, few students learn agriculture and then only few study it in advanced level. (Academic Master research participant 1, February 2024).

The interviewed head of school concurs, saying: "Agriculture graduate teachers are very few in the nation [Tanza-

nia]" (HoS research participant 2, February 2024). Additionally, the head of school 3 states, "The agriculture curriculum is not implemented due to lack of teachers and teaching and learning materials, especially machines. The land is available, but schools are also subject-biased in their registration. Our school is business-biased" (HoS research participant 3, February 2024). Similarly, another research participant stated, "Agriculture is not taught because our school is commerce-biased" (Academic Master research participant 4, February 2024).

4.4. Stakeholders' Perceptions on the Importance of Agricultural Subject in Schools

The researcher asked the respondents to rate the importance of agriculture as a subject. The students' and teachers' responses are shown in Table 9.

Table 9. Students' and teachers' perceptions on importance of agriculture subject in schools.

Rating	Students		Teachers	
	Frequency	Percentage	Frequency	Percentage
Very important	139	94.6	48	94.1
Important	7	4.8	1	2.0
Not important	1	0.6	2	3.9
Total	147	100	51	100

Data in Table 9 indicates that 139 out of 147 students who responded to the item (94.6 percent) rated agricultural subjects as very important in school. Furthermore, the majority (94.1 percent) of teachers rated the agriculture curriculum as

very important in secondary schools. From the students' perspectives, agricultural education is important for different aspects, such as: providing employment opportunities, gaining agricultural skills, developing resources for basic needs,

and developing sources of income. The following excerpts from open-ended questions on the students' questionnaire elaborate these perspectives:

Agriculture is important because it will shape up the students to be independent even after studies. The subject also helps students to educate the society on how agricultural activities can be done well. (Student respondent 25).

Agriculture can give a wide scope to students self-employment, school can get things like vegetables for consumption and extra income from selling crops. (Student respondent 43).

The subject is very important because in our country, many youths are employed in agriculture sector than other sectors. Agriculture increases individual and national income. It gives students an opportunity of engaging in agriculture to satisfy their needs when they are employed by the government. (Student respondent 114).

Agriculture subject equips students with practical skills which can be used in real life. It promotes entrepreneurship, and it ensures availability of food for students in schools and nation at large. (Teacher respondent 26).

Agricultural skills help students to employ themselves. It will help them to have many options to choose while selecting subjects' combinations. Implementing this subject helps the country to have more experts after students opting for agriculture subject in schools. (Teacher respondent 14)

The perceptions about the importance of agriculture as a curricular subject were also captured from stakeholders (administrators and teachers) through interview as the following quotes illustrate.

Agriculture is life. We, Tanzanians live because we practice agriculture as farmers and livestock keepers. (Academic Master research participant 1, February 2024)

Agriculture gives knowledge on crop production and livestock keeping. It also develops agriculture experts. (Academic Master research participant 2, February 2024)

One of the interviewed head of school (HoS) opined, "Agriculture subject is important to be implemented in schools

because many Tanzanian youths are lacking basic agricultural skills" (HoS research participant 1, February 2024). The skills learned from the subject are significant for different areas of life. As one research participant said: "Agricultural skills are used for food production, helps to reduce poverty, engaging in business after school (agri-business), and improve nutrition" (HoS research participant 3, February 2024).

I personally studied agriculture in that time; it was offered by only a few schools. Up to now, I am applying it at home. I used to plant vegetables in boxes. This is because I learned a lot from school. Agriculture does not end in the classroom, but it is practiced outside school. We have big number of farmers, and we need experts to enhance good ways of farming to improve farming practices. (HoS research participant 4, February 2024).

In addition, another head of school added:

Implementing agriculture curriculum gives knowledge on how to engage in several activities such as crop production and livestock keeping. It is an avenue where we use to develop future agriculture experts like extension officers, veterinary officers and administrators in agriculture field. (HoS research participant 4, February 2024).

The head of school 5 commented that studying agriculture in school can provide opportunities for future employment for the school graduates. He asserted:

Agriculture is one of the potential subjects as it influences employment. Nowadays, students complete school up to universities and there is no employment while agriculture adequate in providing employment. Agriculture gives students skills at school level. This makes them self-reliant after graduating. (HoS research participant 5, February 2024)

The results imply that the subject is perceived very positively by different stakeholders from the schools involved in this study.

The researcher sought from students and teachers on whether the subject should be among compulsory or optional subjects. The responses are as presented in Table 11.

Table 10. Students' and teachers' preferences of agriculture as a subject as compulsory or optional.

Preference	Students		Teachers	
	Frequency	Percentage	Frequency	Percentage
Compulsory	64	43.8	38	79.2
Optional	82	56.2	10	20.8
Total	146	100	48	100

As the data in Table 10 shows, there is a significant number of students with different opinions. Whereby 43.8 percent would prefer agriculture subject to be under compulsory

subjects, 56.2 prefer that the subject would be under an optional category. Furthermore, the majority of teachers (79.2 percent) remarked that agriculture as a subject should be

under the category of compulsory subjects, while (20.8 percent) preferred the subject to be among the optional subjects. The results mean that students and teachers differ in the preference of agriculture subject being implemented as compulsory or optional. The following qualitative quotes from various categories of respondents elaborate on the differences in preference.

Agriculture subject needs to be compulsory. We (as a country) intend to be industrialized with adequate production. Many raw materials are from agriculture. Agriculture employs a large proportion of the people even if it is not a formal sector. (Academic Master research participant 1, February 2024).

Agriculture subject should be compulsory. It is a source of income and food. The subject gives an option for employment. (Academic Master research participant 5, February 2024).

Some students in many schools want to learn and apply agriculture but the subject is not implemented in their schools. Youths also want to learn agriculture for indirect employment (self-employment) and continue with life because nowadays there is a problem of unemployment. (Respondent Student 70).

The subject should be compulsory since agriculture is the backbone of our country's economy. It is important because it involves much practical, which is suitable for all students; fast and slow learners. (Respondent Student 35).

Nevertheless, some had a different opinion, as the following examples show:

The agriculture subject should be under optional subjects because some students would not like it. Taking it will make the core/compulsory subjects too many. (Respondent Student 143)

The subject should be optional because some students are

not interested in agriculture. Some professions may not require the knowledge of agriculture. (Respondent student 149)

The agriculture subject should be optional. Some students can opt for business or any other subjects. (HoS Interviewee-6, February 2024).

Agriculture should be an optional subject based on the interests of the learners. (HoSI-2, February 2024).

Agriculture should be optional based on students' interests from form three class level. (AMI-4 February 2024).

The qualitative data demonstrate that from different categories of respondents (students, teachers, and school administrators) there are many wishing for agriculture as a subject to be implemented as a compulsory subject. The reasons being the acquisition of agricultural skills by students, since the subject is very practical and can enhance self-employment among other benefits. On the other hand, those who would prefer agriculture to be optional supported the choice that it would give students freedom to respond to their interests and choose subjects of preference for their combination of studies. Making it optional is also due to the subject load as having many compulsory subjects increases the subjects load and this may be burden to the students. The results imply that, regardless of making it compulsory or optional, agriculture as a subject is perceived important and beneficial to youth in schools.

The researcher further analyzed the data to check if the difference in preferences of agriculture as a subject as compulsory or optional by students and teachers is significant. With the use of SPSS version 22, the researcher employed a Chi-square test of independence to test the null hypothesis: "The preference of agriculture subject as compulsory or optional does not depend on the respondents' category (students or teachers)".

Table 11. Chi-square test results of difference on compulsory or optional preference of Agriculture by teachers and students.

Pearson Chi-square value	Degrees of freedom	p-value	Level of significance
18.085	1	0.00	0.05

Computed for a 2 x 2 table.

The test results in Table 11 show that the Chi-square value is 18.085, and the p-value = 0.00 at degrees of freedom 1. Comparing the p-value with level of significance (0.05), the p-value is far less than the level of significance. Therefore, there is evidence against the null hypothesis. The researcher rejected the null hypothesis and concluded that the preference of agriculture subject as compulsory or optional significantly depends on the respondent category (as student or teacher).

5. Discussion

This study found that the implementation of the agriculture curriculum is hindered primarily by the lack of human resources (i.e., agriculture teachers) in the secondary schools that were studied. The results agree with those of the study by [21] which revealed a severe shortage of agricultural science teachers for secondary schools in KwaZulu-Natal, South Africa. The results are also in line with those of [22] in

Bitooma-Kyamuhunga Sub-County of Bushenyi District-Uganda that schools were lacking qualified teachers in agriculture.

The results imply that the Tanzanian Ministry of Education, Science and Technology should urgently take strategic measures for training agriculture teachers in teacher education programmes as a remedy to the acute shortage of agriculture teachers in schools. Since agriculture is the backbone of the Tanzanian economy, it is critical that agricultural courses are included in more, if not all, tertiary science education training colleges. Agricultural programs need to be developed by funding agricultural science experts in both public and private educational institutions. Otherwise, if subject continues to be unpopular in schools and society, there will be a significant negative impact to the country's economy.

The second factor for the lack of offering agriculture as a subject, as shown by this study, is the inadequacy of agricultural teaching and learning resources in schools. This was identified by about 50 percent of the students and 67.7 percent of teachers respectively. The results are similar to those of [15], whose research cautioned that inadequate teaching and learning resources hinder effective implementation of agriculture in schools and consequently, the lack of resources negatively impacted the implementation of an agriculture curriculum and lead to low enrollment of students in the subject. The findings echo the results of [22] that the implementation of agriculture curriculum was affected by lack of instructional materials. The current study's results are also in alignment with the research by [23] who identified that the implementation of agriculture curriculum in secondary schools in Busheenyi District Bitoomi sub-county in India is affected by an inadequate number of agriculture teachers and the lack of infrastructure and materials.

This current study further found that all the categories of the respondents perceived agricultural subjects very important to be taught in the schools. The results imply that different stakeholders from the schools involved in this study perceive the subject very positively. The skills from agricultural subjects are potentially linked with various opportunities, such as the acquisition of production skills, becoming subject experts, and various self-employment opportunities as alternative to formal employment. The subject is, therefore, seen as a backbone of Tanzania, since it supports a large proportions of youth employment. Implementing agriculture curriculum at the secondary school level can equip many youth skilled in agriculture. The results are in line with those of [9] who identify that the majority of teachers they engaged perceived that the agriculture curriculum is very important for their students to learn.

The development of agricultural skills among learners has long term benefits beyond schooling. A study by [14] established that there is a positive significant relationship between learning agricultural skills in school and agricultural productivity. The findings are further supported by those by [23] who assert that students easily accept studies in agricultural science in secondary schools. The perceived ease or difficulty is posi-

tively related to their future attitude towards choosing the subject as a future career. Also, the findings of the study by [24] demonstrate that agricultural activities are important in addressing issues like food security, health, nutrition, environmental care and education. This study's findings on the benefits of agricultural education in secondary schools are in alignment with the study by [25], who write that agricultural education increases learners' knowledge and love for agricultural activities and promotes healthy food production. The value of entrepreneurial enterprises in agriculture are strategic for developing post-school employment opportunities, which is a claim made in the reach of [26]. They continue that agricultural education has a positive role on innovative skills, business management skills, production, and technical skills for entrepreneurship development among school graduates.

6. Conclusion and Recommendations

One of the aspects that this study examined is the extent to which different factors are hindering the implementation of the agriculture curriculum in secondary schools in Arusha District Council. The findings indicate that the key factors are lack of teachers and agricultural teaching/learning facilities. The research concludes that the absence or acute shortage of agriculture teachers deprive the current generation of youth of an opportunity to develop and acquire agricultural skills in schools and pursue and interest towards this field in future.

The second objective of the study was identifying the perceptions of the stakeholders toward agriculture as a course subject. The results show that all categories of stakeholders rated the subject as very important. However, the majority of students would prefer the subject as part of an optional subjects cluster, while the teachers prefer it to be under a compulsory subjects cluster. The study tested an hypothesis using a Chi-square test of independence and concluded that the preference of the agriculture curriculum being compulsory or optional depends on the category of the respondent. The study, thus, concludes that, agriculture subject is perceived very positively by the stakeholders.

Based on the findings and conclusions of the study, the researcher recommends the following:

- 1) Agriculture courses should be included in many teachers' training colleges and universities and be among the prioritized training programmes to increase the the preparation and the equipping of agriculture teachers for secondary school education.
- 2) Due to the very inadequate implementation of the agriculture curriculum in secondary schools, there is a need to increase agriculture-supportive schools. This can enable the development of the students' interest at an early stage in order for them to pursue agricultural sciences for developing agricultural expertise for the future. In addition, this can enhance job-creation and self-employment by the school graduates through agriculture related opportunities.

- 3) There is a need for strategic plan by the Tanzanian government to focus on developing agricultural universities and colleges that can concentrate agricultural resources such as modern equipment to support schools resources and facilities needs for agriculture subject.
- 4) Since this study was confined to Arusha District Council only, the findings may not be generalized to entire Arusha region or the country. The researcher therefore recommends for further research with wider coverage including other regions in Tanzania for enhancement of the results generalizability.
- 5) Further research should carry out an analysis of the specific implementation pathways, required resources for development of human and material resources for agriculture and potential associated challenges.

Abbreviations

AMI	Academic Master Interviewee
BBT-YAI	Building a Better Tomorrow-Youth Agribusiness Initiatives
FAO	Food and Agriculture Organization
HoS	Head of School
NECTA	National Examination Council of Tanzania
SPSS	Statistical Packages for Social Scientists
TIE	Tanzania Institute of Education
URT	United Republic of Tanzania

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Author Contributions

Daniel Kosia Mokoro is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

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