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# Start Them Early Program Baseline Study: Understanding Youth Perceptions toward Careers in Agriculture

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## Summary

Youth are critical participants within the modernization of African agriculture but often their perceptions of farming are negative. A survey of 1264 secondary school students belonging to eight secondary schools in Dr Congo, Kenya and Nigeria was conducted to assess their attitudes toward career pathways to agriculture and agribusiness. Of these students, 53% ± 2% identified agriculture as their highest career ambition and others recognize supplemental livelihood opportunity from it. Livestock, field cropping, small animal production, and horticulture were seen as the most viable enterprises. Other students (46%) plan to avoid agriculture due to perceived difficulties in securing land (25%), hard labor (30%), and low returns (20%). Agricultural courses are attended by 86% of these students, but they very rarely (9%) belong to extracurricular young farmer clubs. Differences were noted between countries, schools, and between girls and boys. Agriculture exists in a less commercialized stage in DR Congo and this tempers many attitudes toward it. Fewest youth in Kenya are attracted to career pathways in agriculture. Students in schools located in peri-urban areas prefer more intensive agricultural enterprises. Differences were also noted between the perceptions and career plans of young women and men; with women more attracted to horticulture and agro-processing, and having less experience with machinery. The results of this study suggest several avenues for future STEP activities designed to strengthen career pathways toward agriculture in specific schools, but the relatively small sample size is not intended to necessarily reflect upon the larger status within their respective countries.

## Background

A diverse set of economic and socio-cultural factors influence youths' aspirations toward engagement in agribusiness (Betcherman and Khan 2015). The economic factors include low level of agricultural productivity and earnings, causing the youth to form negative perceptions about agriculture as a career (Barratt et al. 2012; Sumberg and Okali 2013; Daum and Birner 2017). Perceptions of youth are influenced by educational level, household responsibilities, and expectations of family members, friends, communities, and the media (Flynn and Sumberg 2017). Indeed, many African youth are convinced there is too few opportunities available through agriculture. For instance, youth with secondary education often show some reluctance to learn agricultural skills as they aspire to take up "white collar" jobs in government or business (White 2012), or through engagement with the digital revolution (IYF 2013). In Ethiopia, very few youth and parents show interest in taking up agriculture as a career due to negative perceptions about the sector (Tadele and Gella 2012; Bezu and Holden 2014). The lack of role models and champions who have succeeded in agriculture is mentioned as causing youth not to aspire to engage in agriculture.

The Start Them Early Program (STEP) is a new youth program launched by the International Institute of Tropical Agriculture (IITA) to advance agribusiness development to secondary schools across Africa. It is based on the idea that agriculture must be the engine of future economic growth across Africa, but the attractiveness of careers in agriculture among youth in secondary schools remains low. Consequently, many youth do not prepare themselves to become modern farmers and agribusiness persons, but rather chase after too few white collar job opportunities, often in urban areas, depriving rural areas of its brightest and most ambitious youth. STEP was launched in August 2019 and is starting its operations in DR Congo, Kenya and Nigeria by working with a limited number of secondary schools and their students. STEP is becoming recognized as a very timely advance because many development agents are increasingly concerned with how to better engage “younger” youth (e.g. 15 to 18 years old) into the agricultural transformation mainstream. One of STEP’s initial activities involves a baseline study to better understand the perceptions and attraction of youth to career paths in agriculture, and differences between different genders and socioeconomic settings. This report describes the initial STEP baseline survey in Dr Congo, Kenya and Nigeria conducted during October 2019.

### **Survey Approach**

A baseline study was conducted to generate information on the attitudes of secondary school students toward agriculture as a candidate career choice. A formal survey was constructed that quantified the proportion and gender of youth that enroll in agriculture courses, belong to young farmer clubs and practice different agricultural enterprises. It consisted of five parts describing 1) school and student characteristics; 2) career pathway ambitions; 3) enrollment in and perceptions of agricultural coursework and practicals; 4) membership and participation in extracurricular young farmer clubs; and 5) engagement within home agricultural enterprises. The survey was developed in conjunction with the STEP teams in DR Congo, Kenya and Nigeria to allow for comparability of results. It consisted of 75 closed and open-ended queries and was field tested and refined in DR Congo by STEP officers from all three countries. Some of these open-ended queries specifically addressed what actions by STEP can best reinforce school and extracurricular agricultural activities that better direct youth to career pathways in agriculture.

The study was conducted among a representative cross section of students in eight systematically selected schools located in contrasting areas. A multistage sampling method was employed. Several schools were approached as possible collaborators with the STEP program and evaluated against early selection criteria. Structured questionnaires were formulated in line with the study objectives and loaded into android mobile devices using KoboToolBox software. Enumerators were trained in the use of these devices. Baseline data were collected using these mobile devices, aggregated in the *kobotoolbox.org* platform, compiled within computer worksheets, inspected for errors and subjected to summary statistics, in most cases sums, means or frequencies. Standard Errors were calculated to assist in mean comparisons. These data were segregated by school, gender, and other parameters of interest to better partition and understand student attitudes, preferences and practices.

### **STEP Schools in DR Congo, Kenya and Nigeria**

**DR Congo.** In DR Congo, STEP is implementing its activities within three schools in South Kivu Province (Eastern DR Congo); Institut Weza, EDAP/ISP, and Institut Mushunguri. Weza

is a private school and the latter two are public. EDAP/ISP is located in a mixed market farming setting, while the other two are located in more subsistence farming areas. Weza is the only institute that is both a primary and secondary school. Agricultural instruction is provided at least three times in a week and offered over several grades.

Some additional characteristics of these schools follow. All the schools have field area for course practicals in crops. They rely on rainfed agriculture and lack irrigation systems. Before engagement with STEP none had agricultural machinery. Two schools include practical training in the rearing of small animals. Marketing and value-addition are underrepresented in the curriculum. There are few computers in these schools but when available are shared between teachers and students for agricultural instruction. Extracurricular agricultural clubs have been in existence for the past two years in Weza and EDAP but are not available in Mushunguri. Where available the clubs meet about two to four times per week depending on the school.

**Kenya.** Schools for the STEP project were selected using the following criterion: 1) availability of facilities and space for establishing pilot enterprises, 2) mixed enrollment of both boys and girls for gender balance, 3) a public rather than private school, 4) ongoing agricultural curricula and students ready to participate in practicals and clubs, 5) located in contrasting peri-urban and rural zones. 6) irrigated fields or ready access to water, and 6) willingness of the school administration to participate in STEP and its studies. After visits to several schools, it was decided to work with Mwiki Secondary School (Nairobi County), Afraha High School (Nakuru County) and Muongoiya Secondary School (Kiambu County). Only the first two schools are described in this report. Plans for expanding the scope of STEP activities to Makueni county in semi-arid east Kenya are also under development.

Afraha Secondary School is located adjacent to a large commercial farming area within Nakuru and the Great Rift Valley. It has adequate land and irrigation for field activities with facilities also available for food processing, operates a computer laboratory but lacks animal enterprise facilities and small-scale farm equipment. Mwiki Secondary School is located on the outskirts of Nairobi but is near mixed highland farming systems, has modest field space, water for irrigation, and ongoing animal enterprises, but lacks a computer laboratory and food processing facilities. Both schools have neighboring schools that could replicate STEP approaches and require assistance with farm inputs, new crop varieties, mechanized tools, and modest renovation. Currently school produce is being provided to the school kitchen and sold to teachers and the neighboring community, or distributed to participating students. Both schools require assistance in upgrading their Information and Communication Technology (ICT) facilities.

**Nigeria.** The first phase of STEP in Nigeria is being implemented in three schools within the South Western region of the country; Fasola Grammar School, Oluponna High School and Lead City International School. Fasola Grammar School and Oluponna High School are both government operated and situated in rural communities; with the former located in a subsistence livelihood setting and the latter in a market-oriented, mixed agriculture area. The third school is a private school, with little land area for establishing demonstration fields but high levels of classroom and laboratory instruction.

The two government schools have sufficient land for agricultural practice on crop production and horticulture, while opportunities in value addition will be emphasized in Lead City International School. Oluponna High School has most of its graduates going into

vocational fields while a small number of students further their education in Universities and Polytechnics. One reason for the small proportion of students furthering their education is that most of their parents lack formal education as well. Secondary schools in Nigeria have compulsory agricultural training during the Junior year, and then offer it as an elective during the Senior year. Attracting more Seniors to that elective becomes a target for STEP in Nigeria. Note that Fasola Grammar School is located close to Fasola Farms, a government farm settlement with agribusiness experts from the Ministry of Agriculture; and that Oluponna High School is adjacent the OFFER Agricultural Center that offers a national diploma in agriculture.

## Results and Findings

**Overall results and findings.** The attitudes of 1264 secondary school youth toward careers in agriculture were assessed at public eight schools in three African countries (Table 1). The average age of these youth was 16 years old, and in general the sample was drawn from students in their final two years of school. This age represents a critical time in determining career pathways following graduation, particularly for youth not destined for tertiary education. Of these students, 41% were girls, and 30% came from farming families. A slight majority of these students (54%) imagined agriculture playing some role in their future, with animal enterprise (42% of them), field cropping (30%) and food processing (15%) being the most attractive options. At the same time, 46% of those surveyed had no attraction to agriculture for a variety of reasons including its requirement for excessively hard labor (30%) while offering reduced returns to effort (20%) and an overall unfavorable image of farmers (21%). At the same time, 25% of these youth stated that they lack the land or facilities needed to practice farming and this excluded it as an option in their career planning.

It is important to note that most of these students attended courses in agriculture (86%) and that in many cases it was a required course. For the most part (81%) this coursework included practicals and field work. Very few of these students (6%) expressed a strong dislike for their agricultural courses. Also, very few of these

Table 1. Summary results of a survey among secondary students concerning attitudes toward agricultural career pathways.

Parameter	Frequency	± SEM
Young women	0.414	± 0.014
From a farming background?	0.299	± 0.013
Future plans for farming	0.544	± 0.014
If yes: future plan involves field crops	0.303	± 0.015
If yes: future plan involves animals	0.422	± 0.016
If yes: future plan involves food processing	0.152	± 0.012
No future plans for farming	0.456	± 0.014
Currently study agriculture in school	0.858	± 0.010
Member of young farmer club	0.093	± 0.008
Currently involved in agricultural enterprise	0.689	± 0.013
If yes: grow field crops	0.575	± 0.017
If yes: raise small animals and livestock	0.365	± 0.017
If yes: practice horticulture	0.238	± 0.019
Not currently involved in agriculture	0.311	± 0.013

students (9%) were members of extracurricular young farmer clubs for a variety of reasons, mostly because schools outside of DR Congo do not offer such clubs, and where offered many youth did not have time (or energy) to participate. Disinterest in these clubs does not mean, however, that students are not presently engaged in farming. Indeed, 69% of those surveyed are involved in farming, mostly as part of family enterprise with field cropping

(58% of them), animal rearing (37%) and vegetable horticulture (24%) the most common activities.

Of the 31% not currently engaged in farming, a variety of reasons were offered including lack of available facilities (59% of them), and lack of interest (21%), time (20%) or parental permission (5%). Students were also asked what a project such as STEP could do to assist them to successfully pursue careers in agriculture, and again a wide variety of responses were collected including help to better access inputs (26%) or new agricultural technologies (22%), finance for their new enterprises (20%), support for improved instruction (14%) and assistance in securing access to land or facilities (12%). These results were then disaggregated by country and gender.

**Trends within countries** Strong trends and differences were expressed between the countries (Table 2). Slightly younger students were surveyed in Nigeria (<15 years old) and fewer girls surveyed in DRC and Kenya (33% and 39% of students, respectively). Large differences in farm family backgrounds exist with nearly half from farms in Nigeria and <10% from farms in Kenya. Fewest future plans for agriculture are made in Nigeria (29%), most in DR Congo (91%). Field cropping is least attractive among students in DR Congo, maybe due to the areas steep terrain. Animal enterprise is more appealing than field crops across all countries. Aquaculture is most attractive in Nigeria (24% of respondents), much less so in Kenya (2% of respondents). Results related to horticultural ambitions suggest that Nigerians do not understand horticultural enterprise, and do not distinguish it from field cropping. Value-added processing was most attractive in DR Congo, suggesting stronger opportunity for cottage and small-scale processing enterprises but across all countries, youth appear to under-recognize marketing and agro-industrial career opportunities.

Aversion to agriculture appears strongest in Kenya and Nigeria and farming is widely viewed to involve drudgery across all countries. The potential profitability of farming is recognized least in Nigeria (9% of respondents) and most in Kenya (26% of respondents). Availability of land poses a problem to many youth in DR Congo (22%) and Kenya (33%). Many youth, but not most, have no interest in agriculture, but have difficulty in articulating their reasons. Career ambitions toward agriculture are very low in Kenya (8% of respondents) but remain high in DR Congo and Nigeria (70 to 80% of respondents). Fewest students in Kenya attend agricultural courses (62%) where it is handled as an elective to other vocational fields, in contrast to the schools in DR Congo and Nigeria where it is a core course. All courses involve classroom lectures but slightly fewer courses include field practicals. Very few students in DR Congo and Kenya strongly dislike their course (3 to 10%) as opposed to some other courses (data not presented). No information on this topic was collected in Nigeria. Many of these results reflect the level of agricultural development within the survey area and the presence and strength of alternative economic sectors within their countries.

Young farmer clubs were in widespread operation only in DRC but well attended there (24% of respondents). Nigerian youth are least familiar farming equipment (only 8%) as opposed to Kenya (20%). A large majority of students remain involved in farming enterprises across all three countries (69%), mostly through home enterprises, but fewest in Kenya (53%). Field cropping is the most common enterprise, and greatest in DR Congo while animal enterprise is less frequent, but with greatest frequency in Kenya. In Nigeria, animal enterprises were not differentiated between small animal rearing (e.g. poultry) and livestock. Fish farming is most common in Nigeria (12%), least in Kenya (<1%) suggesting differences in diets, water resources and available infrastructure. Horticulture appeals to many youth in DRC and

Kenya (between 20 to 28% of respondents) but not understood as a separate enterprise opportunity in Nigeria. To a large extent, opportunities for food processing are not widely appreciated among youth in Kenya, likely because of its more advanced food industry. At

Table 2. Survey results among students in DR Congo, Kenya and Nigeria.

Parameter	DR Congo ( $\pm$ SEM)	Kenya ( $\pm$ SEM)	Nigeria ( $\pm$ SEM)
Female students	0.332 $\pm$ 0.024	0.387 $\pm$ 0.023	0.508 $\pm$ 0.024
<b>From a farming background?</b>	0.338 $\pm$ 0.024	0.092 $\pm$ 0.014	0.461 $\pm$ 0.023
<b>Future plans for farming</b>	0.914 $\pm$ 0.014	0.485 $\pm$ 0.024	0.286 $\pm$ 0.021
If yes: future plan involves field crops	0.205 $\pm$ 0.022	0.311 $\pm$ 0.032	0.394 $\pm$ 0.026
If yes: future plan involves animals	0.402 $\pm$ 0.027	0.493 $\pm$ 0.035	0.399 $\pm$ 0.026
If yes: future plan involves fish farming	0.098 $\pm$ 0.016	0.019 $\pm$ 0.010	0.240 $\pm$ 0.023
If yes: future plan involves horticulture	0.188 $\pm$ 0.021	0.129 $\pm$ 0.023	0.006 $\pm$ 0.004
If yes: future plan involves food processing	0.263 $\pm$ 0.024	0.086 $\pm$ 0.019	0.084 $\pm$ 0.015
If yes: future plan involves marketing	0.092 $\pm$ 0.016	0.153 $\pm$ 0.025	0.064 $\pm$ 0.013
<b>No future plans for farming</b>	0.086 $\pm$ 0.014	0.515 $\pm$ 0.024	0.714 $\pm$ 0.021
If not, why: unfavorable image of farmers	0.094 $\pm$ 0.052	0.225 $\pm$ 0.029	0.230 $\pm$ 0.045
If not, why: farming is too labor intensive	0.250 $\pm$ 0.078	0.282 $\pm$ 0.031	0.345 $\pm$ 0.051
If not, why: farming offers reduced opportunity	0.125 $\pm$ 0.059	0.258 $\pm$ 0.030	0.092 $\pm$ 0.031
If not, why: no land or facilities are available	0.219 $\pm$ 0.074	0.329 $\pm$ 0.032	0.069 $\pm$ 0.027
If not, why: no future interest in farming	0.406 $\pm$ 0.088	0.146 $\pm$ 0.024	0.415 $\pm$ 0.055
<b>Hold career ambition in agriculture</b>	0.707 $\pm$ 0.023	0.084 $\pm$ 0.013	0.798 $\pm$ 0.019
<b>Currently study agriculture in school</b>	0.955 $\pm$ 0.011	0.622 $\pm$ 0.023	1.000 $\pm$ 0.000
If yes: attend agriculture course lectures	0.832 $\pm$ 0.019	0.994 $\pm$ 0.004	0.986 $\pm$ 0.006
If yes: Participate in agricultural practicals	0.905 $\pm$ 0.015	0.653 $\pm$ 0.027	0.852 $\pm$ 0.017
If yes: Strongly dislike agriculture as a subject	0.099 $\pm$ 0.016	0.027 $\pm$ 0.008	na $\pm$ na
<b>Member of young farmer club</b>	0.243 $\pm$ 0.022	0.040 $\pm$ 0.009	0.018 $\pm$ 0.006
Use machinery in club (or elsewhere)	0.181 $\pm$ 0.020	0.200 $\pm$ 0.019	0.084 $\pm$ 0.013
<b>Currently involved in agricultural enterprise</b>	0.718 $\pm$ 0.023	0.530 $\pm$ 0.024	0.815 $\pm$ 0.019
If yes: grow field crops	0.630 $\pm$ 0.030	0.491 $\pm$ 0.034	0.587 $\pm$ 0.026
If yes: raise small animals and livestock	0.309 $\pm$ 0.028	0.441 $\pm$ 0.033	0.360 $\pm$ 0.025
If yes: raise fish	0.026 $\pm$ 0.010	0.005 $\pm$ 0.005	0.118 $\pm$ 0.017
If yes: practice horticulture	0.200 $\pm$ 0.025	0.284 $\pm$ 0.030	na $\pm$ na
If yes: process foods	0.042 $\pm$ 0.012	0.000 $\pm$ 0.000	0.101 $\pm$ 0.016
If yes: market produce	0.023 $\pm$ 0.009	0.005 $\pm$ 0.005	0.022 $\pm$ 0.008
<b>Not currently involved in agriculture</b>	0.282 $\pm$ 0.023	0.470 $\pm$ 0.024	0.185 $\pm$ 0.019
If not, why: no interest in agriculture	0.052 $\pm$ 0.023	0.253 $\pm$ 0.032	0.316 $\pm$ 0.054
If not, why: no time for outside enterprise	0.103 $\pm$ 0.031	0.142 $\pm$ 0.025	0.447 $\pm$ 0.057
If not, why: lack funds to invest	0.216 $\pm$ 0.042	0.195 $\pm$ 0.029	0.197 $\pm$ 0.046
If not, why: land or facilities are not available	0.742 $\pm$ 0.045	0.705 $\pm$ 0.033	0.079 $\pm$ 0.031
If not, why: no permission to do so	0.010 $\pm$ 0.010	0.032 $\pm$ 0.013	0.132 $\pm$ 0.039
<b>How can STEP best assist you?</b>			
Help to provide better training	0.058 $\pm$ 0.012	0.274 $\pm$ 0.023	0.095 $\pm$ 0.015
Help to better access inputs	0.422 $\pm$ 0.026	0.144 $\pm$ 0.018	0.223 $\pm$ 0.021
Help by providing new agricultural technologies	0.279 $\pm$ 0.024	0.179 $\pm$ 0.020	0.199 $\pm$ 0.020
Help to secure access to land or facilities	0.153 $\pm$ 0.019	0.141 $\pm$ 0.018	0.069 $\pm$ 0.013
Help to provide finance to project and enterprise	0.044 $\pm$ 0.011	0.217 $\pm$ 0.021	0.320 $\pm$ 0.024
Assist in achieving food security	0.014 $\pm$ 0.006	0.005 $\pm$ 0.004	0.069 $\pm$ 0.013
Provide other forms of assistance	0.030 $\pm$ 0.009	0.019 $\pm$ 0.007	0.026 $\pm$ 0.008

the same time, youth are seldom involved in marketing (<3%)

Relatively few students are not currently involved in some form of agricultural enterprise, with disinterest is greatest in Kenya and Nigeria (25% and 32%, respectively). Many of the disinterested youth in Nigeria have no time for outside enterprise (45%), presumably so that they can concentrate more on their studies, less so in DR Congo and Kenya (10% and 14%, respectively). Funding poses a smaller obstacle to outside enterprise than might be expected (20% to 22% of respondents in each country, but the availability of land and facilities appears to pose a major barrier in DR Congo and Kenya (72% on average). Few students are forbidden permission to practice outside farming enterprises by their parents (1% to 13% in different countries), in part because a majority of them are already doing so (Table 2).

STEP is developing a multi-faceted approach to career pathways, and this must be refined to meet the needs of specific schools and countries. Few students ask for better agricultural training except for Kenya (27%) suggesting that course upgrades may be viewed as having secondary importance in DR Congo and Nigeria. Proportionately greater demand exists for better access to inputs and new technologies, particularly in DR Congo (42% and 28% of respondents, respectively). That students fail to distinguish between new technologies and the need for training in their application in DR Congo and Nigeria is curious. It is important that STEP and the farming clubs it stimulates provide land and facilities to its members, a need identified by between 18% and 28% of respondents in different countries. In addition, STEP should include labor-saving technologies in its approach. Finance concerns must be addressed but are secondary, although the very low perceived need for investment opportunity in DR Congo (only 4% of respondents) may actually be related to its reduced level of agricultural commercialization compared to Kenya and Nigeria (22% and 32% of respondents, respectively). Note that concerns over food security are reduced among these students across all countries (between <1% in Kenya to <7% in Nigeria). Very few additional forms of assistance relating to STEP's backstopping options other than to the aforementioned ones are requested across all three countries (2% to 3% of respondents).

**Gender Implications.** Of the students surveyed in three countries and eight schools, 41% were girls, allowing for strong gender comparisons (Table 3). Fewer girls profess to originate from farming backgrounds (-12%) or to have future plans involving farming (-28%). Both of these factors imply a gender basis for stigma associated with agricultural careers. Of those girls attracted to careers in agriculture, fewer are attracted to field cropping (-16%), animal rearing (-31%) and fish farming (-20%); but girls are far more attracted to opportunities involving food processing (+36%) and marketing (+46%). More girls than boys are discouraged from farming because it involves drudgery (+43%), but fewer girls believe that agriculture offers reduced opportunity (-33%).

In general, equal proportions of girls and boys study agriculture and participate in field practicals ( $\pm 2\%$ ) although slightly more girls strongly dislike agriculture as a subject (+8%). Girl's attitudes toward agriculture are further illustrated by their reduced involvement in extracurricular agricultural clubs (-48%) and experience in the use of small-scale farming machinery (-78%). However, about equal proportions of girls and boys continue to be engaged in agriculture ( $\pm 7\%$ ), usually through their family farms and enterprises, but with much fewer girls involved in animal and fish rearing (average -26%) while far more active in food processing and marketing (average +78%). Among those girls and boys not currently engaged in agriculture (31% of the total), a variety of reasons are offered including no time from their studies (+19% more girls), insufficient opportunity for investment, reduced access



Table 3. Differences in relationship, attitudes and plans for career paths toward agriculture among secondary student girls and boys (age 16.0 years  $\pm$  0.05).

Parameter	Girls ( $\pm$ SEM)	Boys ( $\pm$ SEM)
<b><i>From a farming background?</i></b>	0.279 $\pm$ 0.020	0.314 $\pm$ 0.017
<b><i>Future plans for farming</i></b>	0.453 $\pm$ 0.022	0.607 $\pm$ 0.018
If yes: future plan involves field crops	0.274 $\pm$ 0.024	0.322 $\pm$ 0.020
If yes: future plan involves animals	0.343 $\pm$ 0.025	0.473 $\pm$ 0.021
If yes: future plan involves fish farming	0.119 $\pm$ 0.017	0.147 $\pm$ 0.015
If yes: future plan involves food processing	0.186 $\pm$ 0.020	0.130 $\pm$ 0.014
If yes: future plan involves marketing	0.122 $\pm$ 0.017	0.078 $\pm$ 0.011
<b><i>No future plans for farming</i></b>	0.55 $\pm$ 0.02	0.39 $\pm$ 0.018
If not, why: farming is too labor intensive	0.364 $\pm$ 0.039	0.238 $\pm$ 0.032
If not, why: farming offers reduced opportunity	0.166 $\pm$ 0.030	0.232 $\pm$ 0.031
<b><i>Currently study agriculture in school</i></b>	0.866 $\pm$ 0.015	0.852 $\pm$ 0.013
If yes: Participate in agricultural practicals	0.805 $\pm$ 0.018	0.820 $\pm$ 0.015
If yes: Strongly dislike agriculture as a subject	0.063 $\pm$ 0.015	0.058 $\pm$ 0.011
<b><i>Member of young farmer club</i></b>	0.067 $\pm$ 0.011	0.112 $\pm$ 0.012
Use machinery in club (or elsewhere)	0.090 $\pm$ 0.013	0.198 $\pm$ 0.015
<b><i>Currently involved in agricultural enterprise</i></b>	0.662 $\pm$ 0.021	0.707 $\pm$ 0.017
If yes: raise small animals and livestock	0.324 $\pm$ 0.026	0.393 $\pm$ 0.022
If yes: raise fish	0.048 $\pm$ 0.012	0.067 $\pm$ 0.011
If yes: process foods	0.089 $\pm$ 0.016	0.034 $\pm$ 0.008
If yes: market produce	0.024 $\pm$ 0.008	0.014 $\pm$ 0.005
<b><i>Not currently involved in agriculture</i></b>	0.34 $\pm$ 0.02	0.29 $\pm$ 0.02
If not, why: no time for outside enterprise	0.216 $\pm$ 0.032	0.179 $\pm$ 0.027
If not, why: lack funds to invest	0.173 $\pm$ 0.030	0.224 $\pm$ 0.029
If not, why: land or facilities are not available	0.556 $\pm$ 0.039	0.607 $\pm$ 0.035
If not, why: no permission to do so	0.043 $\pm$ 0.016	0.050 $\pm$ 0.015
<b><i>How can STEP best assist you?</i></b>		
Help to provide better training	0.142 $\pm$ 0.016	0.141 $\pm$ 0.013
Help by providing new agricultural technologies	0.175 $\pm$ 0.018	0.248 $\pm$ 0.017
Help to secure access to land or facilities	0.137 $\pm$ 0.016	0.108 $\pm$ 0.012
Help to provide finance to project and enterprise	0.219 $\pm$ 0.019	0.181 $\pm$ 0.015

to land and other resources and lack of permission from their families (only 5% of total), presumably holding them back from doing so.

When asked how STEP can assist them to advance career pathways toward agriculture, equal proportions of girls and boys cited a need for better training (14% of total), but more boys asked for stronger exposure to technologies (+34%) while more girls anticipated need for investment capital (19%) and better access to land and facilities (+24%). That more girls express concern over access to land suggests disparity in, or reduced awareness of, land tenure rights; an area that perhaps requires stronger inclusion within current curricula.

## Conclusions

This baseline study reinforces many widely held assumptions about African youth concerning their attitudes and orientation toward career pathways in agriculture, but also illustrates important differences among these youth between countries and gender. Many unfavorable attitudes toward agriculture are held by youth; including those originating from farming families, but at the same time these youth recognize that opportunity exists from adopting modern farming methods and commercial agricultural enterprises. These youth

regard agricultural enterprises as much more than just involving field cropping, but also consider animal enterprises, horticulture and food processing as attractive options. At the same time, opportunities related to marketing remain under-appreciated and food processing appears viewed more as a cottage industry. Less progressive attitudes concerning agricultural opportunities are held in more subsistence-type settings, particularly in DR Congo. Despite this lack of intensification involving the steady transition from traditional to commercial farming, many youth remain committed to becoming successful farmers.

A large majority of secondary students include agriculture as part of their studies, and most regard this course in a positive light; even where these courses are handled as an elective offered against other vocational fields. That agriculture courses are so well attended, and are generally regarded in good standing provides an important foundation upon which STEP can build. Field practicals are less appreciated, in part because tasks of land preparation and weeding may be assigned or perceived as a punishment. Introducing mechanization as a component of these practicals is an important means to altering these negative attitudes. So too is the role of introducing ICT reliant upon mobile devices as a means to obtain planning information, diagnostics and market intelligence. Computer studies are seldom offered within the public secondary schools, and even fewer of them link computer access to agricultural studies. Indeed, it is very important that STEP include strong components of both small-scale mechanization and information technologies within its efforts to improve how agriculture is taught and how many students grow committed toward it. Unfortunately, too few schools appear to sponsor extracurricular young farmer clubs, but the cause for this shortcoming was not examined across our baseline study. Nonetheless, designing these clubs and offering incentives for their success emerges as another important task before STEP.

Differences in how girls and boys aspire to careers in agriculture emerge. Girls are particularly adverse to the excessive labor required in farming, and this drudgery conditions their unfavorable attitudes to the field as a whole. This aversion may be well founded in that across rural areas women often bear the brunt of this hard labor. At the same time, girls appear to be more aware of the benefits of agricultural intensification, and the need for investment in modern technologies. This awareness is particularly strong toward horticulture, rearing of small animals and value-added processing. One concern among girls that tempers their attitude toward farming is that they will have less access to land and facilities following graduation, and explaining their tenure rights may be important in many settings. While the access to small-scale farming machines is limited across all schools, a trend emerged that girls have an aversion to using and learning about these equipment. Presenting agriculture as a family business built upon joint decision making and fair allocation of labor responsibilities is another task before STEP.

Some important elements necessary for STEP's broader success were also identified. Students recognize the need for new technologies; whether they are better access to production inputs such as fertilizer and improved seed in less developed settings, or the provision of new pilot enterprises in more developed areas. That so many students fail to recognize that these technologies must be better represented in course content is curious, and will likely be corrected once STEP's training tools become adopted by instructors. Also among these needs are greater access to land, improved facilities and credit; although this situation varies strongly between countries and schools. Note that country-level

interpretation of this baseline survey follows for each target country; DR Congo (Appendix 1), Kenya (Appendix 2) and Nigeria (Appendix 3).

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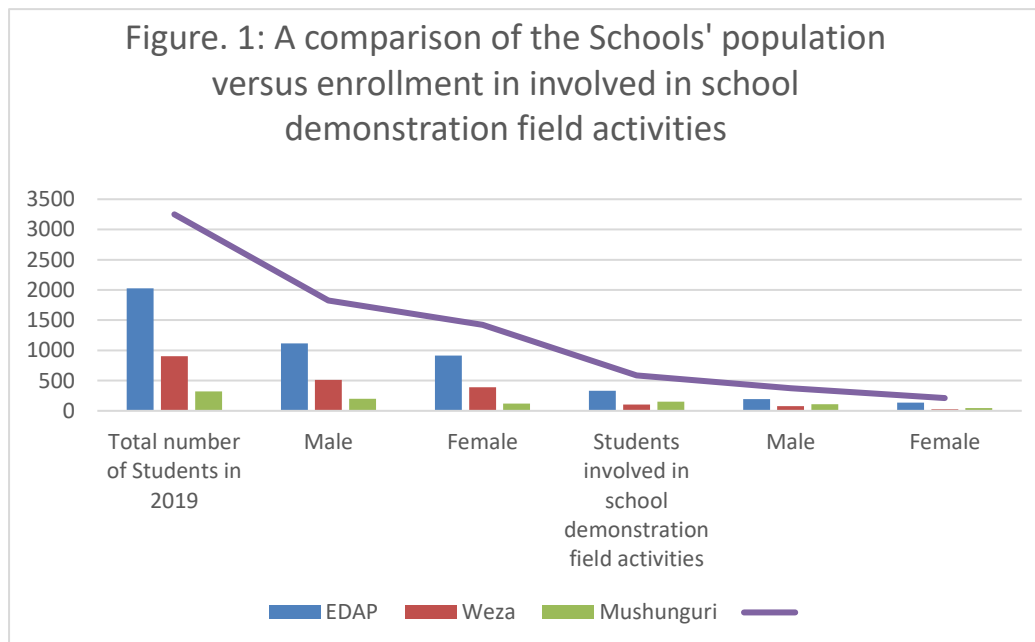
## **Correct Citation**

Mulei, W., Larinde, B., Tangabanga, P.B., Adefioye, A. and Woomer, P.L. 2020. Start Them Early Program Baseline Study: Understanding Youth Perceptions toward Careers in Agriculture. STEP Program, International Institute of Tropical Agriculture, Ibadan. 26 pp.

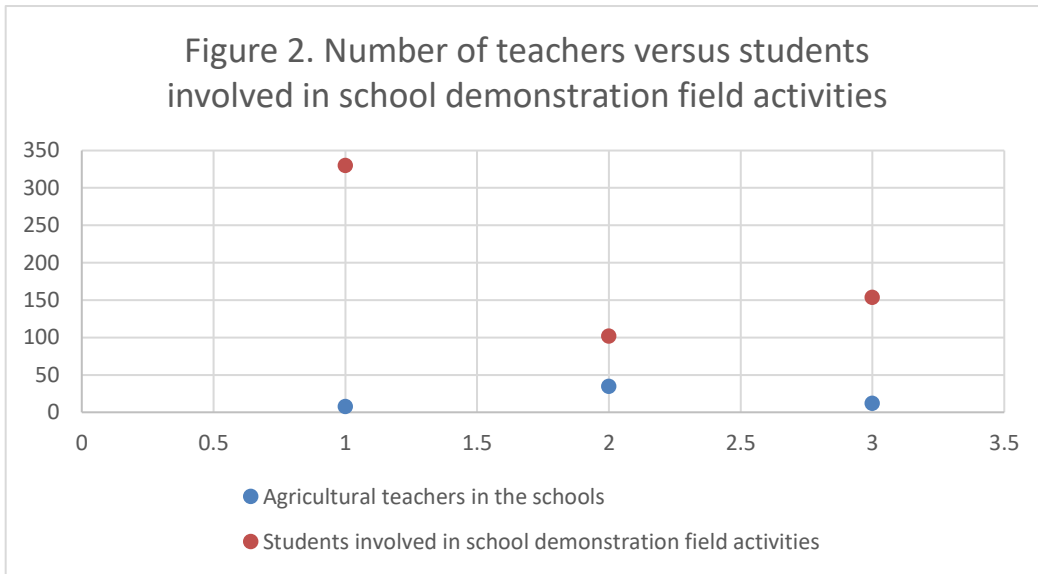
## Appendix 1. The DR Congo STEP Baseline Report

Note that this is a summary of a larger baseline report prepared in DR Congo by the STEP team at the IITA Kalambo Station near Bukavu, South Kivu, and is available upon request from the STEP Coordination Office at IITA Headquarters in Ibadan, Nigeria.

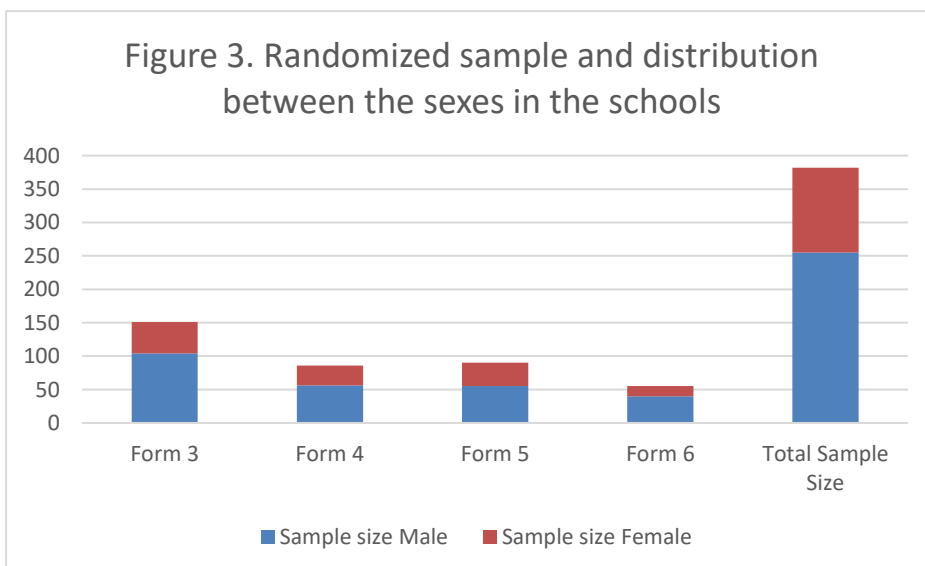
In DR Congo, STEP is implementing its activities within three schools namely; Institut Weza, EDAP/ISP, and Institut Mushunguri; the first one being private and the rest public schools. EDAP/ISP is within a mixed agriculture setting while the other two are in food crop oriented, subsistence farming areas. Weza is the only institute that is both a primary and secondary school. Agriculture is taught at least three times in a week. The schools are open to collaboration with the private, developmental and public sector. Extracurricular agricultural clubs in these schools are no more than two years old since introduction, and non-existent in Institut Mushunguri. These clubs meet within a range of two to four times per week depending on the school. All the schools have demonstration fields for student field practice; below is a comparison of the schools' population against school demonstration field activities (Figure 1), and with respect to the numbers of teachers (Figure 2).



None of the schools have irrigations systems. There was no agricultural machinery available at two of the schools. Small animals were reared in two schools. Two of three schools considered the condition of the vocational agriculture training facilities to require significant upgrading. A sustainable model proposed to the schools involves students benefiting directly from the enterprises by marketing and sharing the enterprise products, a departure from past practices. There were no computers in two of the schools, however, where available both teachers and students share access to them. All of these schools asked the STEP Program to assist in establishing profitable pilot enterprises, strengthen ICT capacities, provide better access modern agricultural technologies, improve agricultural instruction, and raise the profile and standards of their school. This support includes STEP providing training to teachers. Two of three schools requested STEP to assist them acquire new books, participate in exchange visits, and rehabilitate buildings and other facilities.



A sub-sample of students representative of the school’s population was selected using a multi-stage sampling technique for further documentation. Form One students were excluded from the survey because they do not study agriculture or related fields as part of their curriculum. Form Two students were also excluded owing to constraints of scope, time and resources available to STEP. Below is a breakdown of the sample in the three schools in DR Congo, as a result limiting our study to students belonging to Forms Three through Six (Figure 3).



## **Appendix 2. The Kenya STEP Baseline Report.**

*Note that this is a summary of a larger baseline report prepared in Kenya by the STEP team at the IITA-ICIPE Coordination Office in Nairobi, and is available upon request from the STEP Coordination Office at IITA Headquarters in Ibadan, Nigeria.*

Youth are critical participants within the modernization of African agriculture but often their perceptions of farming are negative. A survey of 431 secondary school students belonging to two Kenyan high schools was conducted to assess their attitudes toward career pathways toward agriculture and agribusiness. Only 9% of these students identified agriculture as their highest career ambition but nearly half (49%) recognize livelihood opportunity from it. Livestock, field cropping, small animal production and horticulture were seen as the most viable enterprises. Other students (51%) plan to avoid agriculture due to perceived difficulties in securing land (33%), requirements for excessive labor (28%), low economic returns (26%) and excessive risks (22%). Agricultural courses are attended by 62% of these students, but very few (4%) belong to extracurricular young farmer clubs. Differences were noted between schools, with more intensive enterprises preferred in peri-urban areas. Differences were also noted between the perceptions and career plans of young women and men; with women more attracted to horticulture and agro-processing, and having less experience with machinery. The results of this study suggest several avenues for future STEP activities and should be compared to similar studies conducted in DR Congo and Nigeria.

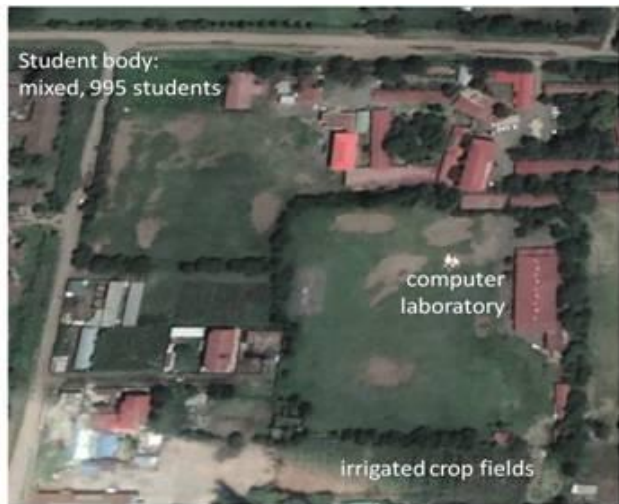
Schools for the STEP project in Kenya were selected using the following criterion: 1) availability of facilities and space for establishing pilot enterprises, 2) mixed enrollment of both boys and girls for gender balance, 3) a public rather than private school, 4) ongoing agricultural curricula and students ready to participate in practicals and clubs, 5) located in contrasting peri-urban and rural zones. 6) presence of irrigated fields or ready access to water, and 6) willingness of the school administration to participate in STEP and its studies. After visits to several schools, it was decided to work with Mwiki Secondary School (Nairobi County), Afraha High School (Nakuru County) and Muongoiya Secondary School (Kiambu County). Aerial images and coordinates of these schools edited from Google Earth are presented with this report. Only the first two schools are described in this report as Muongoiya School could not be accessed due to its ongoing national examinations coinciding with the survey operations and will be surveyed at a later date. Plans for expanding the scope of STEP activities to Kisiyani Secondary School in semi-arid east Kenya are under development.

Afraha Secondary School is located adjacent to a rural area in Nakuru in the Great Rift Valley, has adequate land and irrigation for field activities, facilities available for food processing, operates a computer laboratory but lacks animal enterprise facilities and small-scale farm equipment. Mwiki Secondary School is located on the outskirts of Nairobi but nearby mixed highland farming systems, has modest field space, water for irrigation, and ongoing animal enterprises, but lacks a computer laboratory and food processing facilities. Both schools have neighboring schools that could replicate STEP approaches and require assistance with farm inputs, new crop varieties, mechanized tools, and modest renovation. Currently the Farm produce is currently being provided to the school kitchen and sold to teachers, the neighboring community and distributed to participating students. Both schools require assistance in upgrading their ICT facilities.

The survey team compiled and interpreted the replies from 431 youth attending two different schools in Kenya (Table A2.1). The respondents ranged in age from 13 to 20 years in age (average age 16.7 years) and were 39% girls. Close to one half (49%) of these youth foresee agriculture and agribusiness in their futures, despite relative few coming from strictly farming families (9.2%) and a majority have larger ambitions outside of agriculture (91.6%). Livestock (41%) and field crops (31%) were the two most preferred enterprises with small animal (e.g. poultry), horticulture and marketing also frequently identified candidate enterprises (13% to 15%). On the other hand, few youth identified plans for fish farming and agro-processing. Conversely, a slight majority of youth (51%) expressed disinterest in agricultural career pathways due to its excessive risks, reduced profitability, and high labor requirements (23% to 28% frequency). The most frequent reason, however, is lack of access to land (33%).

A majority of youth are currently studying agriculture as a course within their secondary school curricula (62%). Nearly all of this coursework (99%) includes lectures but many are also engaged in practicals involving field practicals (65%), often as individual rather than group projects. When asked if agricultural studies are among their most enjoyed courses, 15% responded positively, while only 3% included it within their least favorite courses. In general, youth considered agricultural courses to be of satisfactory quality, with an average rank of 2.3 on a scale of 1 to 3 (with 3 considered to be very good).

Several strong differences were noted between schools and boys and girls. There were 14% greater female respondents at Mwiki, indicative of its



**Afraha High School, Nakuru, Kenya, 0°17'44.74"S, 36°04'13.16"E, 1811 MASL**



**Mwiki Secondary School, Kasarani, Kenya, 1°13'32.45"S, 36°56'00.76"E, 1538 MASL**



**Muongoiya Secondary School, Kiambu County, Kenya, 1°11'33.10"S, 36°47'10.45"E, 1768 MASL**

Table A2.1. Characteristics and views on agricultural career pathways among youth surveyed in two secondary schools in Kenya.

Variable	overall	by school		by sex	
		Afraha	Mwiki	boys	girls
----- frequency (unless noted) -----					
<b>Respondents (number)</b>	<b>431</b>	<b>281</b>	<b>150</b>	<b>264</b>	<b>167</b>
Average age (years)	16.7	16.8	16.6	16.9	16.5
Female respondents	0.387	0.338	0.480	0	1
Parents are farmers	0.092	0.075	0.127	0.102	0.078
<b>Future agricultural plans (if yes, what)</b>	<b>0.485</b>	<b>0.491</b>	<b>0.473</b>	<b>0.511</b>	<b>0.443</b>
Field crops	0.311	0.304	0.324	0.341	0.257
Small animals	0.139	0.072	0.268	0.170	0.081
Fish	0.019	0.022	0.014	0.022	0.014
Horticulture	0.129	0.080	0.225	0.096	0.189
Livestock	0.407	0.449	0.324	0.481	0.270
Processing	0.086	0.065	0.127	0.044	0.162
Marketing	0.153	0.130	0.197	0.111	0.230
<b>No agricultural plans (if no, why)</b>	<b>0.515</b>	<b>0.509</b>	<b>0.527</b>	<b>0.489</b>	<b>0.557</b>
low success, excess risk	0.225	0.222	0.231	0.200	0.261
too hard work	0.282	0.230	0.372	0.232	0.352
low profit potential	0.258	0.237	0.295	0.264	0.250
No available land	0.329	0.319	0.346	0.312	0.352
no interest in agriculture	0.146	0.133	0.167	0.160	0.125
<b>Agriculture is highest ambition</b>	<b>0.085</b>	<b>0.103</b>	<b>0.047</b>	<b>0.102</b>	<b>0.054</b>
<b>Currently studying agriculture (if yes)</b>	<b>0.622</b>	<b>0.580</b>	<b>0.700</b>	<b>0.617</b>	<b>0.629</b>
includes lectures	0.994	0.995	0.993	0.995	0.992
includes field practice	0.653	0.519	0.832	0.660	0.643
one of most enjoyed courses	0.153	0.199	0.067	0.159	0.144
one of least enjoyed courses	0.027	0.019	0.041	0.020	0.038
course rating (scale of 1 to 3)	2.3	2.2	2.3	2.3	2.3

more balanced student body. Mwiki is located in Nairobi's peri-urban periphery and enterprise preferences appear adjusted to market opportunities for small animal enterprise and vegetable horticulture. Alternatively, more students in Afraha expressed interest in larger livestock, as ranching and dairy are predominant in the Great Rift Valley where that school is located. Concerns over the drudgery of farm labor were more widespread (+14%) at Mwiki school, perhaps because of its more urbanized setting but also as a result of the greater requirement for agriculture within the curricula (+12%) and for field practice as a component of that agricultural coursework (+31%). Despite its widespread study requirement, the agriculture courses tended to be neither the favorite nor least liked among the students, although the course at Afraha School tends to be better appreciated (+13%). Three strong preferences among girls were also expressed; they are less attracted to livestock enterprise (-21%), more attracted to marketing activities (+12%) and more concerned over the drudgery associated with farming (+12%), often expressed as their aversion to becoming dirty.



Table A2.2. Membership in young farmer clubs and home farming activities among youth surveyed in two secondary schools in Kenya.

Variable	overall	by school		by gender	
		Afraha	Mwiki	boys	girls
-----frequency-----					
<b>Belong to farming club ( if yes)</b>	<b>0.040</b>	<b>0.046</b>	<b>0.027</b>	<b>0.042</b>	<b>0.036</b>
use small-scale farm machinery	0.200	0.159	0.273	0.245	0.127
pay membership dues	0.294	0.308	0.250	0.455	0.000
earn money through participation	0.529	0.615	0.250	0.727	0.167
<b>Home farming (if yes, what enterprise)</b>	<b>0.530</b>	<b>0.535</b>	<b>0.520</b>	<b>0.568</b>	<b>0.469</b>
Home enterprise with field crops	0.491	0.542	0.397	0.445	0.579
Home enterprise with small animals	0.221	0.174	0.308	0.253	0.158
Home enterprise with fish farming	0.005	0.000	0.013	0.000	0.013
Home enterprise with horticulture	0.284	0.215	0.410	0.260	0.329
Home enterprise with livestock	0.261	0.278	0.231	0.281	0.224
Other home enterprises	0.019	0.007	0.039	0.014	0.026
<b>Not engaged in farming (if not, why)</b>	<b>0.470</b>	<b>0.465</b>	<b>0.480</b>	<b>0.432</b>	<b>0.531</b>
Limited interest in agriculture	0.253	0.297	0.181	0.262	0.241
Limited availability of time	0.142	0.136	0.153	0.131	0.157
Limited availability of funds	0.195	0.119	0.319	0.187	0.205
Limited availability of land	0.705	0.669	0.764	0.710	0.699
Limited parental approval	0.032	0.017	0.056	0.037	0.024

The baseline survey also addressed youth participation within farming clubs, and the prevalence of agricultural enterprises within their home farms (Table A2.2). Very few youth participate within extracurricular farming clubs (4%) with little variation between school and gender. Of those that do belong to these clubs, however, large differences exist between their familiarity with machinery between schools (Mwiki +11%) and between boys and girls (girls -12%). Note that these equipment tended to be small-scale weeders and sprayers, not tractors or harvesters. Afraha School tends to operate more profitable enterprises on behalf of its members (+37%). Very anomalous results were obtained between the differences among boys and girls in the payment of membership dues and revenue generation with respect to club membership, and these results require further study as to why girls would be exempt from dues but not welcome to enterprise proceeds. Clearly, much scope exists for the promotion of extracurricular agricultural clubs, but care must be taken to ensure that they are conducted in a profitable and equitable manner.

A very high proportion of youth remain engaged in agriculture within their homes (53%) although fewer young women are engaged in these activities than boys (-10%). The most frequent enterprises are field cropping (49%), horticulture (28%), livestock (26%) and small animal rearing (22%). Very few are engaged in fish farming, marketing and cottage industry. Enterprise choices are partly dependent upon school location with greater reliance upon field cropping in the rural rift valley, and more horticulture and small animal rearing in Nairobi. Young women appear to be expected to contribute to household field cropping to a greater extent than boys (+14%). By far the greatest reported limitation to youth involvement is the availability of land (71%) although other reasons cited include limited

Table A2.3. The distribution of student’s career ambitions, preferences among young women and relationship to enrollment in agriculture coursework.

<b>Career ambition</b>	<b>Preference among students</b>	<b>Preference among females</b>	<b>Currently study agriculture</b>
	----- <i>frequency</i> -----		
Medicine	25%	62%	62%
Science and engineering	19%	16%	57%
Entertainment and media	11%	92%	59%
Travel and hospitality	11%	58%	66%
Business and commerce	10%	50%	41%
Agriculture and veterinary	9%	39%	100%
Law	8%	29%	52%
Education	5%	45%	76%
Other fields	2%	81%	25%

interest, time and funds (14% to 25%). Lack of parental permission is an infrequent reason cited, suggesting that few rural parents insist that their children focus exclusively upon schoolwork at the expense of home enterprise. Also note that the high frequency of home enterprises (53%) conflicts with the low reports of parents employed through agriculture (9%, Table 2.1) suggesting that in many cases farming may be regarded as a secondary household income strategy.

The results of this survey shed important light on the way forward for STEP in Kenya. While youth planning careers in agriculture remain in a minority (Table A2.3), they occupy positions that will allow them to gain better understanding of modern agriculture and agribusiness. Career ambitions among these youth appear to be skewed toward more prestigious, white collar professions that are likely unobtainable. At the same time, modern farming is a primary driver of Africa’s economic growth, and youth can be readied to adjust to the realities of opportunity by preparing for careers in agriculture, even when it is not their first choice. At the same time, agribusiness need not be organized by full time farmers, as those who find success in other professions can then commit savings to invest in actions by other family members. This awareness appears to exist in part by the comparison of the minority who plan for careers in agriculture, versus the many who foresee future engagement with agriculture despite their preference for other fields of employment.

That many youth are enrolled in agriculture courses is in large part the result of its being a required course within some grades (Appendix 2 Annex). Part of this coursework is through lectures, but it is important that lectures be complemented with practicals. Our findings suggest that this is not always the case (Table A2.1). Furthermore, course contents must be regularly updated to provide information of recent proven farming technologies and opportunities. Our rapid survey was not positioned to characterize the quality of the agricultural curriculum, although results indicate that far more students greatly enjoy their agricultural instruction than dislike it, despite the minority who intend to pursue agriculture as a full time career. We note that all youth intent upon pursuing agriculture as a career were enrolled in agricultural courses (Table A2.3), indicative that they are positioning themselves well to take advantage of educational opportunities. But at the same time, we

note that proportionately fewer young women are attracted to careers in agriculture compared to some other fields, suggesting that the enterprise opportunities most attractive to these young women, particularly horticulture and agro-processing are not provided sufficient attention. In addition, those students intent upon business careers appear to avoid agricultural courses, suggesting that opportunities in agro-processing and agribusiness are not being adequately portrayed.

Conducting this survey raised several important challenges and opportunities in partnering with public secondary schools to improve agriculture education. These schools offer much more than just agricultural education and means must be found to integrate STEP’s purpose into the larger curricula and timelines of partner schools (see Appendix 2 Annex). So too, students have only limited time available to advance their understanding of agriculture and their academic schedules are already crowded. One problem exists with access to limited school ICT resources, and this is a situation beyond just the quality of agriculture instruction alone. Teachers view their access to computers as higher priority in an ICT restricted environment. Another problem is the continued perception of farming with excessive toil and drudgery. This must be countered through the provision of labor-saving technologies within the school practicals and perhaps by better glamorizing rural lifestyles.

Opportunity exists to configure agricultural learning in new and innovative ways. Means must be found to stimulate dialogue about agriculture, position teachers and student leaders as livelihood champions, and to initiate and promote extracurricular activities, including young agriculturalist clubs. Stigmas associated with farming appear particularly strong among girls, and coursework, practicals and club activities must highlight the elements of agribusiness more appealing to young women but preferably not by segregating the groups by gender. Finally, this survey clearly indicates that a large proportion of these students continue to practice agriculture at home, and mechanisms must be installed to promote and document the flow of technologies between the two arenas (school and home enterprise).

One important entry point is the STEP’s support for extracurricular “young farmer clubs”. While relatively few students belong to these clubs at present, there appears to be strong support for their operations. Evidence suggests that some students are willing to pay modest membership dues but in the expectation that revenues from pilot enterprises operated by these clubs will benefit them. That so many youth continue to be involved in home agricultural enterprises serves as additional evidence that demand exists for the services that these clubs may provide (Table A2.4). These clubs can provide experiential learning in modern technologies, provide modest opportunities for revenue generation, and introduce members to profitable production inputs and small-scale farm machinery for distribution among members. Work with youth groups elsewhere suggests that competence with farm equipment can also lead to the provision of contracted services as a source of income, and these services in turn reduce the perception that farming necessarily involved drudgery.

Table A2.4. Services requested from STEP to improve youth’s home farm enterprises.

<b>STEP support service</b>	<b><i>frequency</i></b>
Training materials	32%
Funds for expansion	22%
Access to farm inputs	17%
Farm equipment	14%
Access to land	10%
Facility improvement	2%
Improved market access	2%
Irrigation systems	1%

Survey results also allow for households to be classified and their attraction to agriculture and other fields to be quantified (Table A2.5). Households were categorized based upon the reported occupation of students' parents and then grouped as professional, working class, vulnerable and agricultural. Of these four categories the most frequent were assigned to the working class (59%) and the least to farmers (8%), with a significant proportion considered vulnerable (18%); those with parents' unemployed, irregularly employed deceased, or combinations of each. The frequency of students' attitudes toward agriculture was then assigned. Note that the lowest proportion (3%) of youth with strongest ambitions toward agriculture is among those from agricultural backgrounds. This reinforces the belief that those most familiar with farming are the ones who intend to escape it. This stands in contrast to the children of doctors and nurses, 50% of which intend to enter their parent's medical field; or to those of engineers, 40% of which intend to enter science and engineering (data not presented). At the same time we note that students from agricultural backgrounds are the most likely to factor agribusiness into their larger livelihood plans (54%) or to currently be practicing agricultural enterprise (77%). Also note that the student's most attracted to agriculture are from vulnerable households (13%) although they currently have the lowest opportunity to practice it (40%). The reluctance among students to consider farming among those who understand it most, and the stronger interest among those who are in the weakest position to move into farming are trends that must be factored into plans for agricultural training and enterprise support.

#### **Appendix 2 Annex. Secondary School Education in Kenya**

The secondary education phase within Kenya's current "8-4-4 system" follows eight years of primary schooling and requires four years (the first of the two "4s"). At the end of the fourth year, students take examinations that lead to the award of a Kenya Certificate of Secondary Education (KCSE). The examination is also used for admission into universities and training at other institutions of higher education in the technical and vocational stream (the second "4").

There are three types of secondary schools in Kenya; public, private and community-managed *Harambee* schools yet each system adheres to similar curricula. Thirty subjects are offered at the academic secondary level, grouped into six learning areas:

1. Languages (English, Kiswahili, Arabic, German, French)
2. Sciences (mathematics, chemistry, physics, biology)
3. Applied Sciences (home science, agriculture, computer studies)
4. Humanities (history, geography, religious education, life skills, business studies)
5. Creative Arts (music, art and design)
6. Technical Subjects (drawing and design, building construction, power and mechanics, metal work, aviation, woodwork, electronics)

Note that agriculture is treated as one of three Applied Sciences. In the first two years of secondary education, students take as many as 13 subjects. This is narrowed down to 8 subjects in the final two years, with three core and compulsory subjects taken by all students: English, Kiswahili and Mathematics. Students must also take two science subjects, one humanities subject, and either one applied science (e.g. agriculture) or one technical subject chosen from the pool of subjects above. The subjects offered will depend on individual schools and what they can offer in terms of learning resources and teachers, but situating agricultural learning in a way that competes with other technical vocational skills

may not be advantageous to either considering that managing a successful farm requires many of these technical skills.

Students are tested in four subject groups for the KCSE School leaving examination. The three subjects in Group 1 (English, Kiswahili and Mathematics) are compulsory. The final grade on the KCSE is an average of the scores achieved in the best eight subject examinations. Where a candidate sits for more than eight subjects, the average grade is based on the best eight scores. A final grade of C+ is required for university entry, although higher scores are required for some public universities. Admission to programs leading to certificates and diplomas at polytechnics requires a D+ or C- average, respectively.

Agriculture becomes an optional subject starting in Grade 11 (Form 3) but the quality of its instruction, particularly its practicals, varies greatly between schools. Nonetheless, grades awarded within Agriculture in 2018 were among the highest of all subjects, with 88% of students receiving Grade A. Agriculture examination in Kenya consists of three papers, which tests the student's general understanding of the agricultural principles, concepts and practices. The examination papers are separated as follows: 1) Paper 1 covers General Agriculture, Crop Production, Agriculture Economics and Soil and Water Conservation; 2) Paper 2 covers Livestock Production, Farm Power, Farm Machinery, Farm Structures, Farm Tools and Equipment; and 3) Paper 3 considers two practical projects that may vary between schools and students. It is essential that STEP integrate itself into this curricula and better assist students to achieve higher grades if the program is to be considered an asset by administrators and teachers.

### **Appendix 3. The Nigeria STEP Baseline Report.**

*Note that this is a summary of a larger baseline report prepared in Nigeri by the STEP team at IITA Headquarters in Ibadan, and is available upon request from the STEP Coordination Office at IITA Headquarters in Ibadan, Nigeria.*

The study sought to investigate secondary school students' attitudes towards agriculture and agribusiness in three schools in the south-western region of Nigeria. It serves as a baseline study to establishing a youth model proposed within the Start Them Early Program for Nigerian secondary schools that assists in redirecting the aspirations of secondary school students towards careers in modern farming and agribusiness in Africa. The study adopted a descriptive survey research design using questionnaires as the main data collection instrument. Data was provided by 451 secondary school students who were randomly selected from three purposefully selected schools. The survey revealed that 46.1% of these students have come from a farming background, with either or both parents engaged in agriculture-related activities for generating income to sustain their families. This may not be a contributing factor to the high number of students (80%) that expressed interest in getting involved in agriculture in their future plans, although not as their major career path. Many of these students prefer to establish enterprises in livestock production, particularly small animals (40%), crop production (39%) and fish farming (24%). While very few of them prefer food processing (8.4%) and marketing (6.4%). On the other hand, a majority of those who have no future agribusiness plans attributed their disinterest to its labour-intensive requirement but others stated that low profit and no access to land were their reasons. Insufficient financial support was also identified by relatively few students (1%). All the students consider agriculture courses as one of their subjects which was rated below average (1.46) on a scale of 1 to 3. Even though the schools do not have appropriate farm implements, a near majority (48%) of them still prefer only their practical classes as against those (20%) who prefer to be taught exclusively in classrooms. This suggests that the design and implementation of youth-in-agriculture programs in secondary schools should consider providing young people with specialized modern agribusiness training, as this can improve their participation in agricultural innovations that will lead to improved livelihood.

Data collected from 451 randomly-selected students from three secondary schools in Oyo (2) and Osun states of Nigeria were investigated to better understand their perception towards careers in agriculture and key factors that influence their participation in the sector and their future agribusiness plans. The survey had almost equal representation of both boys (49%) and girls (51%), and ranging in age from 12 to 19 years (and an average of approximately 15 years).

Of these students, 46% come from a farming background (Table A3.1), with either or both parents engaged in agriculture-related activities for generating income to sustain their families. Strong differences exist between schools; of the students in Oluponna (91%) that consider agriculture in their future, only 51% of them are from farming background, while 44% in Lead City that also consider agriculture in future, just only 3.9% of them have come from a farming background.

Many of these students prefer to establish enterprises in livestock production, particularly small animals (40%), crop production (39%) and fish farming (24%). While some of them would rather go for food processing (8%) and marketing (6%). Students (1%) who showed interest in horticulture were all from Lead City. This could mean that the potentials of

Table A3.1: Characteristics and views on agricultural career pathways among youth surveyed in three secondary schools in Nigeria.

Variable	Overall	----- by school -----			---- by gender ----	
		Fashola	Lead City	Oluponna	Female	Male
Number of students	451	92	77	282	229	222
in Senior class	48%	39%	33%	55%	53%	42%
in Junior class	52%	61%	68%	45%	47%	58%
Average age (years)	14.9	15.5	13.4	15.1	15.0	14.8
Female	51%	60%	57%	46%	100%	0%
Male	49%	40%	43%	54%	0%	100%
from farming background	46%	65%	4%	51%	46%	46%
Future agricultural plans	80%	65%	44%	94%	78%	82%
if yes for livestock	40%	45%	38%	38%	37%	42%
if yes for crops	39%	13%	9%	28%	19%	29%
if yes for fish	24%	43%	13%	43%	33%	47%
if yes in food processing	8%	0%	19%	9%	13%	4%
if yes in marketing	6%	8%	38%	2%	9%	4%
No agricultural plans, why	20%	35%	56%	6%	22%	18%
No interest in farming	43%	41%	13%	13%	15%	33%
Too labor intensive	35%	53%	18%	40%	40%	28%
Low profit	9%	3%	15%	7%	6%	13%
No available land	7%	0%	15%	0%	2%	13%

horticulture and food processing in Fasola and Oluponna need to be better explained to the students.

On the other hand, majority of those (20.2%) who have no future agribusiness plans attributed their disinterest to its labour-intensive requirement. While others stated that low profit and no access to land were their reasons. Insufficient financial support was also identified but rather by relatively few students (1%).

Table A3.2 shows that all the students offer agriculture as one of their subjects which was rated below average (1.6) on a scale of 1 to 3. A near-majority (48%) of them prefer only their practical classes as against those (20%) who prefer to be taught exclusively in classrooms. Similar result was obtained for Lead City and Oluponna whose majority of students also prefers the practical classes. In Fasola, many of the students prefer their agricultural trainings be conducted in the classroom. This may be due to the labor-intensive characteristics they have attributed to their field activities as shown in Table A3.1.

No agricultural club exists in Fasola and Oluponna, and the only few students (10%) from Lead City (a private school) who are members of the school's Young Farmers Club do not generate any form of revenue from their club enterprises. This shows that many government schools, particularly those in the rural communities do not have enough resources to engage their students in any form of extracurricular activities, while schools running agricultural clubs may not focus on establishing profitable ventures for members to see the efficacy of making a living from agriculture.

Table A3.2: Rating of agricultural training in schools.

Variable	Overall	----- by school -----			----- by gender ----	
		Fasola	Lead City	Oluponna	Male	Female
Study agriculture	100%	100%	100%	100%	100%	100%
Course rating (1-3)	1.5	1.3	1.2	1.6	1.5	1.4
Agriculture training method						
Coursework	99%	99%	94%	100%	99%	99%
Practical	85%	80%	63%	92%	87%	83%
Preferred training method						
Prefer lecture	20%	40%	16%	14%	17%	22%
Prefer practical	48%	25%	35%	60%	52%	45%
Prefer both	10%	13%	14%	7%	11%	9%
Prefer none	22%	22%	35%	19%	21%	24%

These findings however, present a very good opportunity for STEP to launch agricultural clubs in the three schools, with strong emphasis on establishing profitable enterprises. Short-term commodities (of maximum maturity of 3-4 months) are also strongly advised considering the short school academic periods.

Table A3.3: Distribution by the number of students who participate in school agriculture-related clubs and engagement in home agribusiness enterprises.

Variables	Overall	----- by school -----			----- by gender ----	
		Fasola	Lead City	Oluponna	Male	Female
<b><i>Belong to farming club</i></b>	1.8%	0%	10.4%	0%	1.4%	2.2%
if yes, use machinery	8%	0%	24%	0%	13%	4%
if yes, pay membership dues	71%	0%	71%	0%	67%	75%
if yes, generate income	0%	0%	0%	0%	0%	0%
Engaged in home farming	82%	83%	46%	90%	84%	79%
if yes, with field crops	59%	75%	55%	54%	62%	56%
if yes, in fish farming	12%	1%	9%	15%	15%	9%
if yes in animal enterprise	36%	25%	30%	40%	39%	33%
if yes in food processing	10%	7%	12%	11%	4%	16%
If yes in marketing	2%	0%	3%	3%	1%	3%
<b><i>Not engaged in home farming, why</i></b>						
Limited interest in agriculture	32%	27%	36%	28%	25%	36%
Limited availability of time	45%	53%	56%	24%	47%	43%
Limited availability of funds	20%	20%	11%	32%	28%	14%
Limited availability of land	8%	0%	14%	4%	9%	7%
Lack parental approval	13%	7%	11%	20%	16%	11%



Table A3.4: Student's future career choices.

Student career ambition	Overall	Male	Female	from farming backgrounds
Medicine	29%	28%	30%	13%
Business and commerce	12%	11%	12%	12%
Engineering and science	10%	12%	9%	14%
Education	10%	11%	9%	7%
Agriculture	5%	3%	7%	13%
Media and entertainment	4%	4%	4%	11%
Law & government	3%	3%	3%	9%
Other fields	1%	1%	0%	9%

The survey also investigated those who practice any kind of agribusiness at home. Majority (75%) of students (Fasola) are into Home Crop production also there are more male (62%) than female students involved in crop production practices at home. 82% of the respondents are involved in home farming in different enterprises this implies that majority of the students are involved in agricultural practices even at home through their parents' influence. The students (45%) that were not engaged in home farming stated that they had limited time available for agricultural activities while 32% had limited interest in agriculture.

Table A3.4 shows the distribution of respondents based on their future ambition and the possible influence of having a farming background and future agricultural plans and how these affects their career choice. Many (77%) of the respondents have future agricultural plans, 45% have farming background and 27% of these students aspire to go into the medical field. 66.7% have future agricultural plans, 33% and <1% willing to travel and hospitality (data not presented).

A significant portion (29%) of student respondents have future career ambition in agriculture, there are slightly more female to male students (30% to 28%, respectively) and 85% of the respondents had agricultural plans and 50% of these students have strong

Table A3.5: How STEP can provide support to students attracted to agriculture?

Variable	Overall	----- by school -----			----- by gender -----	
		Fashola	Lead City	Oluponna	Male	Female
Improved training	32%	17%	26%	38%	27%	37%
Access to farm inputs	22%	19%	21%	23%	23%	22%
Access to technology	20%	40%	18%	14%	28%	12%
Access to land	9%	1%	3%	13%	10%	9%
Financial assistance	7%	22%	15%	1%	4%	10%
Food provision	7%	0%	0%	10%	6%	8%
Other needs	3%	1%	17%	1%	2%	3%

farming backgrounds (data not presented).

Table A3.5 shows areas STEP can provide support to the students for their developed interest in agriculture. 82.6% of the students are willing to practice agriculture upon graduation and students of Oluponna Community High School had the highest number of students willing to have an enterprise in agriculture. Majority (31.9%) of the students proposed the need for financial assistance as the support needed to be able to practice agriculture after school. While 22.2% stated the need for access to farm inputs and also technology (20.0%).

These findings show a need for STEP intervention in provision of financial assistance, access to farm inputs and technology as it is seen that students are willing to practice agriculture upon graduation but due to few constraints like lack of farm inputs and financial assistance they may not be able to go into agriculture.