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Understanding gender-based differences in the engagement of the youth in agribusiness in South-Kivu province, Democratic Republic of Congo

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Abstract

Agribusiness is a means of job creation capable of reducing unemployment among young people in developing countries. However, the rate of unemployment is notably higher among young girls who have a relatively low propensity to seize new entrepreneurial opportunities than their male counterparts. Using the Oaxaca-Blinder approach, this study measures the share of differences in young men's and young women's engagement in agribusiness in the South-Kivu province of DR Congo. The study builds on a sample of 375 young people, including 28% of girls, drawn from youth associations in Bukavu and its neighborhoods, the catchment area. The results revealed that a difference of 29% was perceived between the engagement of young men and women in agribusiness. About 3% of this difference was explained by land possession, 16% explained by the contribution of different observable characteristics between the two groups, and 84% attributed to discrimination. Thus, disparities in engagement would have decreased by about 16%, if young women had the same socioeconomic and demographic characteristics or the same access to productive resources as their male counterparts. Therefore, we recommend that interventions aimed at giving equal opportunities to female and male youths should be encouraged and promoted.

KEYWORDS

agribusiness, equal opportunity, gender-based differences, youth

1 | INTRODUCTION

Several arguments favor agribusiness as a means of job creation capable of reducing unemployment among young people in developing countries (Sumberg & Okali, 2013; Naamwintome & Bagson, 2013; Olokundun, Falola, & Ibidunni, 2014). However, it turns out that men do more farming than women. Therefore, the unemployment rate is higher among young girls who have a relatively low propensity to seize new entrepreneurial opportunities such as agribusiness (Cheryl, 2014; Holger, 2011).

In the Democratic Republic of Congo, young people represent more than 30% of the total population (28 million young people) and have an unemployment rate of 28%. By gender, girls are the most exposed to unemployment due to their under-education and socio-cultural barriers (Nkoy, 2014). However, the precarious political and economic context prevailing in the country for almost two decades reflects a situation of social crisis characterized by the inability of the secondary and tertiary sector to employ the population, especially the youth (DSCRP, ; Gajraj,). South-Kivu is the second province of the country where the unemployment rate is the highest and varies

greatly depending on the environment and gender. In the rural areas, it stands at 6.9%, 15.3% in cities, and 28.3% in the city of Bukavu (Cheryl, 2014; Holger, 2011). According to Gajraj (), women's activity rate is slightly lower than that of men (50.6% against 54.3%, respectively) with a meager wage rate compared to that of men (only 2.4% against 18%). Similarly, the average monthly working income of women is $15, significantly lower than that of men, which is $20.

Following numerous postulates in favor of the expansion of agribusiness as a means of absorbing the massive unemployed young people and reducing their unemployment rate, several initiatives aimed at promoting agricultural entrepreneurship among young people have been undertaken over the past 10 years and implemented individually or in partnership with the government, development partners and the private sector to promote the engagement of young people in agriculture (Karen, 2015; Naamwintome & Bagson, 2013; Olokundun et al., 2014; Sumberg & Okali, 2013).

As a result, increasing attention is currently being paid to youth entrepreneurship in agribusiness at both the national and provincial levels. However, there is still a significant difference in the engagement of young men and young women in agribusiness by up to 20% (UNDP, 2009). Numerous empirical studies maintain that the differences observed are explained by the inequalities of access to resources, favoring their engagement in agribusiness such as access to land, finance, education, storage facilities, logistics, low income, among others (Kwenye & Sichone, 2016; Nnanna, Eze, & Ijeoma, 2015; Olokundun et al., 2014; Sunday, Inimfon, Samuel, & Damian, 2015). In addition to these challenges, young women have low self-esteem in entrepreneurship, and that increases a negative perception of agribusiness, leading to their non-participation (Samardick, 2000), as well as access to new agricultural technology (Karen, 2015).

Furthermore, by focusing on the Democratic Republic of Congo (DRC) case, more particularly in South-Kivu province, we observed that agricultural entrepreneurship among young people was rarely documented and that even rarer are the studies that have examined the differences based on gender in youth engagement in agribusiness. However, studies conducted in other countries focused on areas such as the analysis of the decision of young people in rural areas to participate in the agricultural workforce (Sunday et al., 2015); the determinants of entrepreneurial choices of graduates in agribusiness in the Abia region of Nigeria (Emerole, Dorcas, & Kelechi,); the determinants of youth participation in the agricultural workforce in the state of Abia in Nigeria (Nnanna et al., 2015); the involvement of rural youth in agriculture by exploring the importance and challenges in controlling the agricultural sector in Zambia (Kwenye & Sichone, 2016); youth participation in agriculture in the district municipality of Nkonkobe (Cheteni, 2017); and agribusiness as a remedy for youth unemployment (Olokundun et al., 2014).

Considering the scarcity of literature in this area, the importance of youth in agribusiness in the region and the gender inequalities previously noted; excellent knowledge of the factors determining young people's engagement in agribusiness as well as the related gender differences would be an essential step in the development of strategies for eradicating youth unemployment in the South-Kivu province in the DRC.

This study identifies the factors and measures the share of gender-based differences in the engagement of young men and women in agribusiness in the South-Kivu of DRC. It draws up the socioeconomic profile of young people, estimates their participation rate in agribusiness before analyzing the different determinants of engagement.

2 | METHODOLOGY

2.1 | Data used

The data used in this study were collected through a survey on agricultural entrepreneurship among groups of young people whose ages vary between 15 and 35 years, conducted by the International Institute of Tropical Agriculture (IITA) in South-Kivu, DRC in 2015. A multistage sampling technic was used to survey youths in the study area. First, we consider Bukavu city and about 25 km around its neighborhood, which was made of rural, urban, and peri-urban environments. In the frame of this survey, several institutions working with youth in the province were approached to constitute the list of all the youth groups and associations in the area. Among these institutions are the provincial minister of youths, the United Nations Institutions, International and Local Non-Government Organisations (NGOs) working with youth in South-Kivu. A total of 110 groups of youth was identified through that process, out of which 75 groups (or 68% of the groups) were reached. From each group, a sample of five individuals (including boys and girls) was randomly selected to administer the individual questionnaire. In total, 375 youth were interviewed, of which 28% were females (see Table 1).

2.2 | An analytical framework for youth engagement in agribusiness in South-Kivu

The framework for a young person's decision to engage in agrobusiness in South-Kivu is similar to the internal migration model. The decision to migrate involves both the push and pull factors (Harris & Todaro, 1970; Lewis, 1954). On the one hand, economic agents are forced to leave rural areas due to certain factors such as the lack of opportunities, the pressure exerted by poverty, the traditional agricultural system, etc. On the other hand, employment opportunities, infrastructure, and education attract migrants to the urban area.

TABLE 1 Distribution of the sample by gender and place of residence (%)

Area of residence	Female	Male	Total
Urban	53 (50.9)	158 (58.3)	211 (56.2)
Rural	29 (27.8)	76 (28.)	105 (28)
Peri-urban	22(21.15)	37 (13.65)	59 (15.73)
Total	104 (27.7)	271 (72.2)	375 (100)

Note: Figures in parentheses are percentages. Source: Authors' computation.

Indeed, the Lewis (1954) model explains migration as a transfer from the workforce in a surplus sector (rural areas) to the workforce of a deficit sector (urban areas). As a result, wage employment in the formal sector, both public and private, is considered a surplus sector, which cannot reduce unemployment among young people in urban areas (Bakare, 2011; Olokundun et al., 2014). Consequently, a refocusing on agriculture is an appropriate remedy for youth unemployment (Barbu & Capusneanu, 2012; Naamwintome & Bagson, 2013; Sumberg & Okali, 2013). The agricultural sector, among other potentials, offers a wide range of jobs, not the least because of the multifaceted and multifunctional nature of the sector. The underlying hypothesis is that the agricultural revolution characterized by commercial agriculture or agribusiness is the basis of the remarkable degree of success obtained in eradicating unemployment among young people (Barbu & Capusneanu, 2012; Olokundun et al., 2014).

To this end, the decomposition of Oaxaca-Blinder (1973) equivalent to the extension of Fairlie (2005) reveals the differences in the engagement of young men and women in agribusiness in South-Kivu, DRC. The Fairlie (2005) decomposition method is similar to that initially proposed by Oaxaca (1973) and Blinder (1973) with the difference. The so-called Oaxaca-Blinder method applies only to linear dependent variables. Using non-linear variables, Fairlie (2005) breaks down the difference in probabilities of young men and women engaging in agribusiness in South-Kivu, DRC, into two parts.

The analysis is based on the estimation using a Probit model of the determinants of the probability of engaging and considers a binary variable A_i of the decision to engage as the result of a latent variable A_i^* representing the decision to participate continuously.

$$\begin{cases} A_i = 1 \, if \, A_i^* > 0 \\ A_i = 1 \, if \, A_i^* \leq 0 \end{cases}$$

It is assumed that the decision to engage A_i^* is explained by several characteristics represented by the vector X_i (age, sex, socioeconomic conditions). β contains the slope of the parameter and the intercept and a term of error ε_1 normally assumed to distribute [N (0, 1)]:

$$A_i^* = \alpha + \beta_i X_i + \varepsilon_1 \quad (1)$$

The analysis of differences in the decision to engage is based on the estimation of the influence of young people's profiles on the probability of deciding to engage. According to Fairlie (2005) the breakdown for the non-linear model of engaging in agribusiness can be expressed as follows:

$$\bar{A}^h - \bar{A}^f = \left[\sum_{i=1}^{N^h} \frac{h(X_i^h \hat{\beta^h})}{N^h} - \sum_{i=1}^{N^f} \frac{F(X_i^f \hat{\beta^h})}{N^f}\right] + \left[\sum_{i=1}^{N^f} \frac{F(X_i^f \hat{\beta^h})}{N^f} - \sum_{i=1}^{N^f} \frac{F(X_i^f \hat{\beta^f})}{N^f}\right] \quad (2)$$

where

- $\bar{H}^j$: is the average probability of participation in agribusiness in population j (with $j = f, h$ for young men and young women respectively);
- X_i^f: corresponds to the distribution of observable characteristics within the population considered;
- $\hat{\beta^f}$: Represents the estimated coefficients assigned to the observed characteristics, N^f refers to the sample size of each sub-population and F (.) represents the cumulative distribution function, which follows a normal distribution.

The decomposition associated with the first equation uses men as the reference group. The coefficients estimated in the population of South-Kivu are used to weigh the first term of the expression. In contrast, the distribution of characteristics of women is used to weight the second term. The choice of the group of men as the reference population suggests discrimination against women (Berchet & Jusot, 2010; Fairlie, 2005; Oaxaca, 1973).

The breakdown of the difference in the average probability of participation can be written differently using the group of women as the reference group:

$$\bar{A}^h - \bar{A}^f = \left[\sum_{i=1}^{N^f} \frac{F(X_i^h \hat{\beta^f})}{N^h} - \sum_{i=1}^{N^j} \frac{F(X_i^f \hat{\beta^f})}{N^f}\right] + \left[\sum_{i=1}^{N^f} \frac{F(X_i^h \hat{\beta^h})}{N^h} - \sum_{i=1}^{N^h} \frac{F(X_i^h \hat{\beta^f})}{N^h}\right] \quad (3)$$

In this case, the coefficients estimated within the group of young men are used to weight the first term of the decomposition. In contrast, the average distribution of the observable characteristics within the group of young women is used to weight the second term of the expression. This (Equation 3) would suggest that the existing discriminations favor the group of young men (Berchet & Jusot, 2010; Blinder, 1973; Oaxaca, 1973).

As a result, the first term of the two expressions measures the difference in participation between the two groups due to differences in the distribution of observable characteristics [the determinants of group engagement being its characteristics (the endowment effect)]. At the same time, the second term measures the difference in the state of engagement between the two populations, attributable to differences in the effect of the observable characteristics of the estimated coefficients. The estimated coefficient of a characteristic here represents the contribution or the return of the latter in the decision to commit to agribusiness (Berchet & Jusot, 2010; Fairlie, 2005).

Therefore, Expressions 2 and 3 are equivalent while considering the breakdown of inequalities in engagement and may, however, lead to differences in the estimates depending on the reference group used. Due to the variability of the results according to the reference group used, the theoretical literature suggests using the coefficients estimated on the sample (Fairlie, 2005; Oaxaca, 1973). This approach considers that discrimination represents both an advantage for the first group and a disadvantage for the second group.

Using the coefficients estimated in the total sample ($\hat{\beta^*}$), the method proposed by Fairlie (2005) makes it possible to assess the relative contribution of each determinant to the difference in the average probability of committing between the two groups. The question is whether age, gender, level of education, and other socioeconomic characteristics contribute to the difference between engaging in

agribusiness by young people in South-Kivu, DRC. The contribution of an observable characteristic X_1 can be expressed as follows:

$$\frac{1}{N^h}\sum_{i=1}^{N^h} F\left(\hat{\beta}_0^* + X_{li}^h\hat{\beta}_1^* + \ldots + X_{ki}^f\hat{\beta}_k^*\right) - F\left(\hat{\beta}_0^* + X_{li}^f\hat{\beta}_1^* + \ldots + X_{ki}^f\hat{\beta}_k^*\right) \quad (4)$$

In this way, the difference in engagement attributed to the variable X_1 is measured by the expected change in the probability of deciding to engage within the group of men by substituting the distribution of the variable X_1 of the group of men for that of the group of women, all other things remaining equal. The relative contribution of the observable characteristics can be positive or negative. A negative estimate suggests that the variable in question contributes to the decrease in the difference in participation, which is attributed to a difference in the distribution of observable characteristics between young men and young women.

3 | RESULTS AND DISCUSSIONS

3.1 | Participation in agribusiness

This study involved the participation of 375 young people from different areas of residence and association/groups out of whom 135 or 36% responded favorably to having engaged in one of the activities linked to agribusiness and 240 or 64% said that they had not been involved in agro-business in South-Kivu, DRC.

Table 2 shows that 36% of the youths interviewed participated in agribusiness in South-Kivu. The percentage of participation was higher in the group of young men (44%) and 15% in young women in South-Kivu. However, young men are more involved in rural areas (50%) than in urban areas (49.5%) and peri-urban areas (9.2%). These results agreed with those of Torimiro and Oluberode (2006), Nnanna et al. (2015), and Cheteni (2017). These authors showed that men generally dominate in rural areas because of their agriculture and their endurance efforts at fieldwork. Also, the majority of young people living in urban areas undertake activities in rural and peri-urban areas. The previous could be difficult for women given their social responsibilities of caring for children, housework, and the family in general.

3.2 | Different links in agribusiness by gender and place of residence

Despite the simplicity of the agribusiness sector, its extensive nature (Obst, Graham, & Christie, ,) describe it as any activity involving the production, processing, and marketing of agricultural goods and services or other related activities (Olokundun et al., 2014). Results in Table 3 show that most of the young people who engage in agribusiness in South-Kivu are mostly concentrated in production (58.5%), where women were the most represented (75%). Followed by marketing (36.3%) were young men (37.8%)

TABLE 2 Participation of young people in agribusiness (%)

Agribusiness	Urban			Rural			Péri-urban			Overall		
	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total
Non-participant	49 (92.5)	99 (62.7)	148 (70.1)	21 (72.4)	27 (35.5)	48 (45.7)	18 (81.8)	26 (70.3)	44 (74.6)	88 (84.6)	152 (56.1)	240 (64.0)
Participants	4 (7.6)	59 (37.3)	63 (29.9)	8 (27.6)	49 (64.5)	57 (54.3)	4 (18.2)	11 (29.7)	15 (25.4)	18 (15.4)	119 (43.9)	135 (36.0)

TABLE 3 Link in agribusiness (%)

Agribusiness link	Urban			Rural			Peri-urban			Overall		
	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total
Production	–	26 (44.1)	26 (41.3)	8 (100.0)	34 (69.4)	42 (73.7)	4 (100.0)	7 (63.6)	11 (73.3)	12 (75.0)	67 (56.3)	79 (58.5)
Transformation	–	2 (3.4)	2 (3.2)	–	5 (10.2)	5 (8.8)	–	–	–	–	7 (5.9)	7 (5.2)
Marketing	4 (100.0)	31 (52.5)	35 (55.6)	–	10 (20.4)	10 (17.5)	–	4 (36.4)	4 (26.7)	4 (25.0)	45 (37.8)	49 (36.3)

were more involved than their female counterparts (25.0%). Processing activities were almost nonexistent (5.2%), and only young men were involved. Depending on the place of residence, production-related activities were more practiced in rural and peri-urban areas and done by 73.6 and 73.3% of youth live in those areas, respectively. On the other hand, marketing-related activities were more practiced in urban areas (55.5%) and peri-urban areas (26.6%). The processing of agricultural products was done in rural (8.7%) and urban (3.7%) areas. Indeed, men's massive involvement is justified by the many opportunities and advantages that they hold, unlike women. The latter face numerous constraints, particularly the lack of access to land, inputs, productive resources, and financial services; limited access to technologies and processing equipment and factories. Our result is in line with those of Sunday et al. (2015) and Cheteni (2017), which proved that men were more willing to do agribusiness than women given the high risks to which they are exposed to couples with limited assets available to them. In contrast, the study by (Spring,) shows that women are increasingly entering commercial farming.

3.3 | Socioeconomic and demographic profile of young people

The results in Table 4 illustrate the socioeconomic and demographic patterns of young people involved in this study. From this table, there was a significant difference between young people (men and women) living in rural areas, urban, and the peri-urban regions at the 10% threshold. Concerning the level of education, it turned out that the majority (49.6%) of young people have reached a secondary education level, 39.2% had university-level, 9.6% had primary level, and only 0.74% had no formal education. Young women were less educated than their male counterparts. Most of them stopped at the primary level. Twenty-five percent of young women had reached the primary school level as against 75% of men. Also, 42% of young men had reached university level against 18.7% of young women; 56.2% achieved a secondary school level as against 48.7% of young women. The Chi square test also proved that there were significant differences between young people who have reached a university and the primary level and who want to engage in agribusiness. These results are similar to those of Sosina and Stein (2014) and Cikezie, Omokore, Akpoko, and Chikaire (2012), which showed that education as human capital enables farmers to make decisions about their agricultural activities. Training improves the level of adoption of modern farm technologies by young farmers and, therefore, helps to develop a younger and better-informed farming population. However, the low engagement rate of young people with university education level or those who have no education level implies that the unemployed, uneducated, and young university graduates do not take advantage of the possibilities offered by agribusiness. These results corroborated Hudu, Hamza, and Afishata (2014). According to them, academics do not prefer agribusiness as a means of creating jobs for themselves after

TABLE 4 Profile of young people

Variables	Female	Male	Overall	χ^2 test
Areas of residence				
Urban	4 (25)	59 (49.5)	63 (46.6)	3.42*
Rural	8 (41.1)	49 (50)	57 (42.2)	0.45
Peri-urban	4 (25)	11 (9.2)	15 (11.11)	3.5*
Educational level				
Non-formal education	0 (0.0)	1 (0.8)	1 (0.74)	0.13
Primary	4 (25)	9 (7.5)	13 (9.6)	4.92*
Secondary	9 (48.7)	58 (56.2)	67 (49.6)	0.31
University	3 (18.7)	50 (42)	53 (39.2)	3.20*
Age group				
% 15–20 years	4 (10.1)	12 (25)	16 (11.8)	3.0003*
% 21–25 years	8 (26.1)	31 (50)	39 (28.8)	3.93**
% 26–30 years	1 (6.2)	47 (39.5)	48 (35.5)	6.80***
% 31–35 years	3 (18.7)	29 (24.3)	32 (23.7)	024
Agribusiness training	1 (18.7)	26 (21.8)	29 (21.4)	0.080
Professional training	6 (37.5)	66 (55.4)	72 (53.3)	1.82
Access to land by a young person	4 (15.2)	4 (25)	22 (16.4)	0.97
Access to land properties by a group	5 (31.2)	36 (32.7)	41 (32.5)	0.013**
Source of funding				
Self-financing	12 (65.5)	78 (75)	90 (66.6)	056
Credit	0 (0.0)	1 (0.8)	1 (0.7)	0.13
Donations and legacies	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Other	1 (6.2)	2 (1.6)	3 (2.2)	1.35
Comparison of means between quantitative variables				
	Average	Average	Average	*T* test
Age	25.3 (5.5)	27.1 (5.1)	26.9 (5.2)	−1.35
Group seniority	11 (7.5)	7.6 (5.2)	8 (5.6)	2.28**
Number of years after the end of the study	6.6 (7.3)	3.9 (5.6)	4.2 (5.8)	1.70*
Value of individual assets ($)	1,489 (409.8)	1,970.8 (112.2)	1,913.1 (110.4)	−1.43
Value of group assets ($)	5,049.6 (0)	4,721.7 (86.1)	4,760.6 (76.4)	1.39

Note: *** Significant at 1%, ** Significant at 5%, * Significant at 10%. The figures in parentheses represent the standard deviation.

graduation. They would prefer salaried employment in other non-agricultural sectors that present fewer constraints for young beginners than the agricultural industry.

Considering the age variable, the young people surveyed were in the productive age, and their vibrant energies could be used in agricultural projects. The average test difference indicates that there is a significant difference between the age groups (15–20, 21–25, and 26–30 years), respectively, at the threshold of 10 and 1%. The majority (35.5%) was between the ages of 26 and 30 years, 28.8% were between the ages of 21 and 25, while 2.8% were between the ages of 15 and 20. These results are in agreement with those of Baah (), Olaniyi and Adewale (2012), Cheteni (2017), and Sunday et al. (2015), which have proved that young people of this age have a high propensity to engage in agribusiness. Therefore, they are impatient to discover new ideas or agricultural innovation than those with advanced age and who generally resist the modification of their old production systems.

However, young men participated more in vocational and technical training program (55.4%) than their female counterparts (37.5%). 21.8% of young men against 18.7% of women participated in agribusiness training. Therefore, training in agribusiness is essential to the success of the development of the sector in itself. This training in the production, marketing, and processing of agricultural products allows them to acquire agribusiness as a business and profit from any activity related to it (Naamwintome & Bagson, 2013; Sunday et al., 2015).

As a result, on average, the asset value of young people and groups of young people is estimated at approximately $1,913.1 and $4,760.6, respectively. It turns out that men ($1,970.8) have more assets than women. The results obtained by Cheryl (2014) have shown that men have more assets than women because of social

norms and domestic and reproductive obligations, which create time constraints.

The results on access to finance reveal that self-financing is a useful source of funding for young people to engage in agribusiness in South-Kivu. Around 75% of young men start their activities with self-financing against 65.5% of women. Some studies revealed a positive and significant relationship between young people's participation in agricultural production and access to credit. The latter infers that accessibility to finance, in the form of inputs, would encourage young people to participate in agricultural production activities (Bello & Saror, 2011). However, it is difficult for young people to access loans for entrepreneurial businesses given their poor socioeconomic characteristics, the political context, and financial institutions characterized by a poor perception of young people. To this, low credit portfolios, high-interest rates, and guarantees are required for credit applicants (Stephen & Hayford, 2015). In South-Kivu, young people currently do not consider financial institutions as an option within their reach to support their projects. Instead, they see the parents and family resources, which they receive as donations, as the only available sources of funding. Besides, only a tiny proportion of women have a bank account or have access to credit because of lack of land titles or assets that can be used as collateral. As an alternative, they participate in tontines (savings and revolving credit association), which often, due to the limited savings capacity of the members and their informal nature, do not allow them to raise sizable funds to start substantial businesses (UNCDF, 2016).

It is also noted from this table, that about 25% of young men had access to land against 15.2% of young women. These results agreed with those of Emerole et al. () and Sunday et al. (2015). Women's inaccessibility to land is because, in many societies, gender inequality in access to the landed property is formalized. Men inherit and receive landed properties from their fathers at marriage. Women often do not receive land, either by inheritance or by donation. However, it is expected that a husband will share the landed properties he receives with his wife. Shared landed properties confer cultivation rights on women, but does not imply control of the land, since women cannot sell land without their husbands' permission (Holger, 2011; Quisumbing & Pandolfelli,). Even if they do, the land they cultivate tends to be smaller and of lower quality than men (Holger, 2011).

TABLE 5 The decomposition of Fairlie

No. of obs	375	
No. of obs (female)	104	
No. of obs (male)	271	
Pr (Yi = 0) if female	0.153	
Pr (Yi = 1) if male	0.439	
Total commitment difference	0.285	
The share attributed to characteristics	0.045	Or 15.7%
Variable	Coefficient	Elasticity (dy/dx)
Age	0.005 (0.32)	0.005 (0.32)
Level of education	0.004 (0.45)	0.003 (0.45)
Technical and professional training	0.001 (0.16)	0.000 (0.16)
Agribusiness training	−0.014 (0.45)	−0.013 (0.45)
Access to new information technology (IT)	0.001 (0.10)	0.000 (0.10)
Manufacture experience	−0.003 (0.21)	−0.002 (0.21)
Service experience	0.002 (0.19)	−0.002 (0.19)
Urban	0.001 (0.20)	−0.001 (0.20)
Rural environment	−0.001 (0.24)	−0.001 (0.24)
Organizational experience	0.001 (0.11)	0.000 (0.11)
Experience in entrepreneurship	−0.025 (1.44)	−0.252 (1.44)
Possession of land	−0.030 (2.76)**	−0.03 (2.76)**
Source of funding	0.000 (0.08)	0.000 (0.08)
Ln individual assets	0.012 (0.97)	0.011 (0.97)

Note: *** Significant at 1%, ** Significant at 5%, * Significant at 10%.

3.4 | The relative contribution of individual characteristics in the difference in participation in agribusiness by young men and women

The decomposition analysis proposed by Fairlie (2005) examines the share of the difference in engagement between young men and young women attributable to a difference in the distribution of observable characteristics illustrated in Table 5. The results in this table show that 15.7% of the difference in youth engagement is explained by the difference in the distribution of observable characteristics between the two groups. Thus, disparities in perceived participation would decrease by about 16%, if young women had the same socioeconomic and demographic characteristics or equal access to productive resources as men (Fairlie, 2005).

To this end, among all the observable characteristics introduced into the model, only the possession of land represents the most relevant determinant to explain the disparity of engagement of young men and young women in agribusiness in South-Kivu. This is explained by 2.76% of the difference attributed to all the characteristics observed. Although not significant, the other variables contributed to explaining the difference in the engagement of young people (male and female) in agribusiness in South-Kivu. Experience in entrepreneurship contributed about 1.44%, while the value of assets contributed 0.97%.

The breakdown of commitment inequalities also proved that the observable characteristics explain 16% of the total difference in agribusiness, which means that around 84% of the difference in commitment is attributable to a difference in the estimated coefficients, that is, in the effect of the observed characteristics. This share is often seen as an approximation of discrimination. It suggests that the impact of the characteristics observed on the decision to hire is different, depending on the population considered.

So the difference in the decision to hire young people (men and women) is dictated by push factors (stressors).

TABLE 6 Determinants of youth engagement in agribusiness

	Model 1 (male and female)		Model 2 (male)		Model 3 (female)	
Variables	**Coef (Z)**	**dy/dx**	**Coef (Z)**	**dy/dx**	**Coef (Z)**	**dy/dx**
Gender	0.862 (4.57)**	0.272 (5.26)**	–	–	–	–
Age	0.001 (0.09)	0.000 (0.15)	−0.001 (0.04)	−0.000 (0.04)	−0.014 (0.31)	−0.002 (0.32)
Level of education	−0.035 (0.33)	−0.006 (0.18)	−0.023 (0.19)	−0.008 (0.19)	−0.122 (0.48)	−0.021 (0.48)
Technical and professional training	−0.143 (0.92)	−0.050 (0.89)	−0.08 (0.46)	0.031 (0.46)	−0.144 (0.33)	−0.025 (0.33)
Agribusiness training	0.337 (1.59)	0.127 (1.54)	0.243 (1.07)	0.096 (1.07)	0.473 (0.55)	0.106 (0.44)
Access to new information technology (IT)	0.874 (2.51)*	0.334 (2.6)**	0.962 (2.50)*	0.359 (2.99)**	−0.246 (0.15)	−0.037 (0.18)
Experience in manufacturing	−0.497 (1.03)	−0.158 (1.2)	−0.603 (1.15)	−0.216 (1.33)	0.627 (0.31)	0.153 (0.24)
Entrepreneurship service expert	0.440 (1.15)	0.168 (1.12)	0.535 (1.27)	0.210 (1.32)	−0.339 (0.23)	−0.048 (0.29)
Urban	0.125 (0.55)	0.039 (0.48)	0.227 (0.88)	0.088 (0.88)	−0.13 (0.23)	−0.023 (0.23)
Rural environment	0.610 (2.52)*	0.231 (2.5)*	0.776 (2.75)**	0.302 (2.89)**	0.192 (0.32)	0.035 (0.3)
Organizational experience	−0.025 (1.28)	−0.009 (1.31)	−0.021 (0.99)	−0.008 (0.99)	−0.008 (0.13)	−0.001 (0.13)
Experience in entrepreneurship in the community	0.029 (1.40)	0.010 (1.39)	0.017 (0.73)	0.006 (0.73)	0.097 (1.64)	0.017 (1.61)
Access to land by individual	0.601 (2.27)*	0.231 (2.22)*	0.370 (1.27)	0.146 (1.28)	2.148 (2.64)**	0.694 (2.94)**
Source of funding	−0.065 (1.12)	−0.021 (1.04)	−0.073 (1.12)	−0.028 (1.12)	−0.020 (0.12)	−0.003 (0.12)
Ln individual asset	−0.099 (1.95)*	−0.035 (1.94)*	−0.036 (0.57)	0.014 (0.57)	−0.250 (2.60)**	−0.043 (2.4)*
_conscons	−0.455 (0.74)		−0.089 (0.12)		0.914 (0.54)	
Number of obs	375		269		104	
LR χ^2 (15)	84.20		38.46		28.97	
Prob > χ^2	0.0000		0.0004		0.0105	
Nickname R^2	0.1718		0.1043		0.3244	
Log-likelihood	−202.93156		−165.19675		−30.163283	

Note: Significant at the threshold of: *** 1%, ** 5%, * 10%.

3.5 | The determinants of youth engagement in agribusiness in South-Kivu

Logistic regression analysis (general model, gender model, place of residence, and decomposition of differences) was carried out to identify the factors likely to influence the decision and which create differences in engagement between young men and young women in agribusiness in South-Kivu, DRC.

The results of the determinants of youth engagement in agribusiness in South-Kivu, DRC, presented in Table 6 indicate that the models as specified are globally significant at the 1 and 5% threshold with respective R^2 of 17.18, 10.43, and 32.1% of the variability in the dependent variable associated with independent variables specified for the models. The latter implies that several variables that could affect young people's decision to enter agribusiness in the study area were not included in the model.

Concerning model 1, it appears that gender, access to land, access to new information technology (IT), staying in rural areas, significantly increases the probability for a young person to engage in agribusiness in South-Kivu, DRC. On the other hand, an increase in the value of a young person's assets decreases his chance of participating in agribusiness in South-Kivu at the threshold of 5%. Taking into account the results of marginal effects, gender, access to new information technology (IT), staying in rural areas, access to land, increase by 0.272, 0.334, 0.231, 0.231 times, respectively, the chances or the probability for young people to engage in agribusiness in South-Kivu' DRC. These results agree with the findings of Sofa and Cherly (), Sunday et al. (2015), and Cheteni (2017). These results prove that, compared to young women, all other things being equal, young men have more chances to engage in agribusiness because of the greater constraints limiting their access to production assets, inputs, and employment opportunities. To this end, access to land is considered one of the critical elements to ensure food and financial autonomy for the individual and to increase agricultural productivity and, therefore, constitutes a crucial issue to facilitate agribusiness. This result seems paradoxical, giving those found by Musemwa et al. (2007), who claimed that women have more interest in agribusiness than men. Young men see farming as a dirty job and tend to engage in activities other than agribusiness (Cheteni, 2017).

On the other hand, the increase in the value of a young person's assets by one unit reduces the probability of engaging in agribusiness in South-Kivu, DRC, by 0.35 times. However, the latter is, instead,

looking to invest in sectors other than agribusiness that can produce in a shorter time (Maïga, Christiaensen, & Amparo, 2015; Osadebamwen, Ideba, & Ikheloa, 2015).

The results of model 2 of determinants of men's engagement, also provide information that access to new information technology (IT), staying in rural areas is statistically significant and positive at a threshold of 1 and 5%. This means that access to ITs and or residing in rural areas increases the chances of young men engaging in agribusiness by 0.962 and 0.776, respectively. These results agree with those of Maïga et al. (2015), Osadebamwen et al. (2015) who argued that in rural areas young people return to farming by constraint because of their high access to productive resources, their physical strength and also inherit the family trades.

Also, model 3 of the determinants of young women's engagement, indicates that access to land is statistically significant and positive at the 1% threshold and increases the probability of young people entering agribusiness. These results are consistent with those of SOFA, Team and Doss (), Musemwa et al. (2007), and Cheteni (2017) who proved that, although women do not have access to land, they exploit small portions that are usually less fertile compared to that of their male counterparts. Therefore, it is clear that improving their access and security of tenure leads to direct positive effects on agricultural productivity and, consequently, to the improvement of household well-being.

Besides, the increase of one unit in their asset values reduces their chances by 0.250 times of engaging in agribusiness in South-Kivu, DRC. According to studies by Holger (2011) and Sofa and Cherly (), women from all regions and all contexts face a surprisingly similar set of constraints limiting their access to production assets, inputs, and employment opportunities. The reasons may be that women have less income to buy assets (television, radio, computers, etc.). They may have less access to financial services, less time available to negotiate services, or, due to prevailing social standards, they must wait for men to finish using certain goods before they are entitled to their services.

3.6 | Model of determinants according to the place of residence

The determinants of young people in agribusiness according to the place of residence (Urban, Rural, and peri-urban) are presented in Table 7. It shows that the three models are globally significant at the 1% threshold and 5% with R^2 of 18.2, 18.9, and 36.6% explaining the

TABLE 7 Determinants of youth engagement in agribusiness by place of residence

	Urban		Rural		Peri-urban	
Variable	Coefficient	Elasticity (dy/dx)	Coefficient	Elasticity (dy/dx)	Coefficient	Elasticity (dy/dx)
Gender	1.068 (3.51)**	0.276 (4.85)**	0.896 (2.69)**	344 (2.93)**	1.106 (1.77)*	0.193 (2.04)*
Age	−0.024 (0.97)	0.007 (0.97)	0.020 (0.68)	0.008 (0.68)	0.033 (0.67)	0.006 (0.71)
Level of education	−0.126 (0.90)	−0.040 (0.90)	0.052 (0.26)	0.020 (0.26)	−0.056 (0.13)	−0.011 (0.13)
Technical and professional training	−0.048 (0.22)	−0.015 (0.22)	0.306 (0.96)	0.120 (0.97)	−1.309 (1.97)*	−0.260 (2.05)*
Agribusiness training	0.318 (0.98)	0.109 (0.93)	0.338 (0.90)	0.130 (0.93)	0.750 (1.19)	0.197 (0.97)
Access to new information technology (IT)	1.774 (3.44)**	.622 (4.82)**	−1.001 (1.34)	−0.363 (1.7)*	–	–
Experience in manufacturing	−1.025 (1.55)	−0.222 (2.72)**	–	–	–	–
Entrepreneurship service expert	−0.317 (0.53)	−0.092 (0.55)	1.064 (1.23)	0.344 (1.82)*	–	–
Organizational experience	−0.052 (1.91)*	−0.016 (1.92)*	0.004 (0.10)	0.001 (0.1)	−0.033 (0.49)	−0.006 (0.49)
Experience in entrepreneurship in the middle	0.079 (2.84)**	0.025 (2.86)**	−0.072 (1.31)	−0.028 (1.31)	−0.099 (1.18)	−0.019 (1.13)
Access to land by individual	0.831 (1.65)*	0.311 (1.58)*	0.231 (0.59)	0.090 (0.6)	1.981 (1.96)*	0.649 (2.06)*
Source of funding	0.021 (0.27)	0.006 (0.27)	−0.197 (1.64)	−0.078 (1.63)	−0.650 (1.86)*	−0.130 (2.63)**
Ln individual asset	−0.077 (0.84)	−0.024 (0.84)	−0.112 (1.43)	−0.044 (1.43)	−0.109 (0.78)	−0.021 (0.76)
_constant	−0.116 (0.13)	–	−0.102 (0.11)	–	0.273 (0.15)	–
Number of obs	211		105		59	
LR χ^2 (15)	46.76		27.29		24.47	
Prob > χ^2	0.0000		0.0070		0.065	
Nickname R^2	0.1817		0.1885		0.3657	
Log-likelihood	−104.31112		−58.4392		−21.21662	

Note: Significant at the threshold of: *** 1%, ** 5%, * 10%.

variability in the dependent variable associated with independent variables specified for the model. It can be inferred from the table that the engagement of young people in agribusiness, whether in urban, rural, and peri-urban areas, is more driven by push factors (incentives) than pull factors (attractive).

Indeed, in urban, rural, and peri-urban areas, gender has a positive and significant influence on young people's decision to engage in agribusiness in South-Kivu, DRC. These results are in line with those of Akpan (), Sunday et al. (2015) and prove that young men and women do not have the same chances of engaging in agribusiness in all three areas.

Likewise, access to new information technology (IT), the increase of 1 year of experience in entrepreneurship in the environment, possession of land by a young person in an urban environment, and a suburban setting increase their chances of deciding to engage in agribusiness. In other words, considering the results of the marginal effects, a unitary increase in access to information and communication technology (ICT), experience in entrepreneurship in urban areas, entrepreneurship in rural areas, possession of land in urban and peri-urban areas, increase by 0.622, 0.025, and 0.311 times the chance or probability for young people to engage in urban agribusiness, 0.344 in rural areas, 0.649 times in peri-urban areas. These results confirm those of Sunday et al. (2015), who prove that a densely populated area will probably have constraints on agricultural land. This finding may suggest that the decision of urban and peri-urban youth could be conditioned because increasing the number of landowners among the youth will likely reduce production costs and likely increase farm profits. Likewise, the increase in the participation of young people in technical and vocational training and access to new information technology (IT) increases their chances of engaging in agribusiness. This could probably be linked to the incentives available or planned in such programs.

Also, access to new information technology (IT) in rural areas, access to technical and vocational training, access to finance in peri-urban areas, reduces the probability of young people engaging in agribusiness. Their marginal effects indicate that the increase of one unit in the participation in technical and vocational training and access to finance reduces by 0.363, 0.260, and 0.130 times, respectively, the chance of a young person to be able to engage in agribusiness. These results agreed with those of Sichone and Kwenye (2018) and Afande, Nderitu, and Mathenge (2015). They proved that the invasiveness of young people to technical and vocational training programs and access to finance provided by government institutions or financial institutions are often severe for most young farmers because they do not have the collateral required by financial institutions. The lack of guarantee can be explained mainly by the inability of young people in urban, peri-urban, and rural areas to access capital.

4 | CONCLUSION

This study focused on the gender-based differences in the engagement of young people in agribusiness in South-Kivu, East DR Congo, identifies the factors, and measures the share of gender-based differences in the engagement of young men and young women in agribusiness. It draws up the socioeconomic profile of young people, estimates their participation rate in agribusiness before analyzing the different determinants of engagement.

The results of this study show that about 36% of young people responded favorably to having engaged in one of the activities linked to agribusiness, and 64% said that they had not been involved in agrobusiness in South-Kivu, DRC. It can, therefore, be seen that access (push factors) contributed significantly to the difference in participation in agribusiness for young men and young women.

However, the results of the determinants of youth engagement in agribusiness are more dictated by push factors including access to land, access to new information technology (IT), the environment, and experience in entrepreneurship, which all have a positive and significant influence on the decision of young people. On the other hand, the value of the assets owned by young people, experience in organization, access to new information technology (IT) in rural areas, participation in vocational training, and access to finance, negatively influence youth engagement in agribusiness in South-Kivu, DRC.

These results suggest that facilitation of access to landed properties, vocational and technical training, access to loan/finance, access to new information technology, and participation of women in political decision-making increase youth involvement in agribusiness. Consequently, this reduces the unemployment rate and gender gap in the engagement of young people in agribusiness in South-Kivu, DRC.

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