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Rural youth interest in economic activities along the agricultural value chain: empirical evidence from KwaZulu-Natal (South Africa) and implications

RESEARCH ARTICLE

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Abstract

Identifying which agricultural activities rural youth would be interested to participate in and understanding which factors are enabling and constraining their participation is essential in attempting to alleviate rural youth unemployment and ameliorate the poor succession plan in smallholder agriculture. Employing a recent household survey dataset, descriptive statistics, and multinomial logit regression, this study sought to examine this issue. A structured questionnaire was designed and administered to 152 rural youth from Amajuba and Umzinyathi districts in KwaZulu-Natal Province. The study showed that rural youth are interested in engaging in all activities along the agricultural value chain. The factors enhancing their interest include access to resources and services (agricultural training, land, information, and communication technologies), age, and having a household member engaged in agriculture. However, access to other resources and services (formal education, social media, finance, psychological capital, and wealth), and dependency ratio were found to negatively affect their interest. These findings suggest that policymakers should formulate strategies that are sensitive to the resource endowment and access to services of the rural youth when aiming at engaging them in agricultural activities.

Keywords: rural youth, agricultural value chains, perceptions, psychological capital, smallholder agriculture
JEL code: Q10

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1. Introduction

Poverty and food insecurity are common challenges faced by the majority of people living in remote areas of many developing countries, especially those in Sub-Saharan Africa (SSA) (AGRA, 2020; Bello *et al.*, 2021; FAO, 2014). According to Mills (2012), the lagging economic growth of the SSA region and the persistence of socio-economic challenges, years after independence, can be attributed to the lack of human and government capacity, poor infrastructure and trade access, the effects of too little (or too much) foreign aid, the legacy of arbitrary colonial boundaries, and low productivity, to mention a few. The spillover effects of these include unsustainable livelihoods and unemployment. The latter has now become chronic to South Africa. For the past decade, the country's unemployment rate averaged about 25% (O'Neill, 2021). Even more, recent statistics show that more than 34% of the South African labour force is unemployed (Statistics South Africa, 2021). This is despite the introduction and implementation of various policies and programs such as the Reconstruction and Development Program', Growth, Employment and Redistribution Policy', National Development Plan Vision 2030', Employment Tax Incentives Bill (also known as the Youth Wage Subsidy') and the Expanded Public Works Program'. These initiatives were introduced to improve economic growth and alleviate multiple socio-economic challenges, including poverty, inequality, and unemployment. Nevertheless, these challenges remain chronic, especially among the poor.

Given the prolonged poor economic growth rate and the impact of the pandemic, job creation to absorb all active employment seekers is unlikely, even in the long run. For this reason, policymakers, scholars, and government officials have identified self-employment as a potential strategy to assist in alleviating unemployment, especially among the youth. This was further reinforced by the President of South Africa, Mr. Cyril Ramaphosa, in his last two State Of the Nation Addresses on the 11th of February 2021 and 10th February 2022, in reference to the National Development Plan Vision 2030. The involvement of rural youth in alternative entrepreneurial activities will not only lighten the burden of government dependency but will help improve the economic *status quo* of rural residents (Kimmitt *et al.*, 2020). According to the National Planning Commission (2012), the agricultural sector is the primary economic activity in rural areas with the potential to offer rural youth the opportunity to do so. Given that most of these youth have exposure in agriculture, either through experience or observation, the potential livelihood strategies that can be derived from their involvement cannot be ignored.

However, many studies on youth participation in agriculture (Abdullah *et al.*, 2012; Adesina and Favour, 2016; Aphunu and Atoma, 2010; Babu *et al.*, 2021; Bahaman *et al.*, 2010; Bezu and Holden, 2014) have reported very limited involvement and interest. Due to the complexity and multi-dimensionality of the challenges of engaging young people in agriculture, resolving the well-known constraints (such as access to land and finance) will not guarantee youth involvement in the sector. There is ample evidence in the literature that highlights that young people do not have a preference to engage in agricultural activities. Studies indicate that they perceive agriculture as low status, hard labor, and unattractive job (Geza *et al.*, 2021; Irungu *et al.*, 2015). According to the youth, agriculture is a part-time job and not a profession or livelihood strategy. Youth prefer non-agricultural careers / off-farm employment because they consider them as more stable, providing relatively more income, and requiring less physical labor (Bello *et al.*, 2021; Rietveld *et al.*, 2020). The majority of these studies, however, emanate from research conducted on primary agriculture. This narrow focus on primary agriculture has given the impression that youth do not prefer to engage in agriculture as a sector. They largely ignore the possibility that, although youth might be less interested in primary agriculture, they might be interested and willing to engage in other opportunities along the agricultural value chain. The nature of the work and the incentive structures in primary agriculture are different from those from agricultural value chain. Thus, it is hypothesized that economic activities along the agricultural value chain are more attractive than primary agriculture.

While engagements in most activities within the agricultural value chain (such as processing) require substantial investment, public-private partnerships, and specific advanced skills, there are other less demanding activities that youth can engage in relatively easier. Such activities include retailing of farm inputs and

outputs, serving as a farm agent, buying and reselling livestock and livestock products, and transportation of both inputs and outputs to different locations (O'Planick, 2016). These activities can serve as a stepping-stone for rural youth to engage in agriculture and allow them to initiate and run their businesses. However, at present, most of the value chain activities in rural areas are offered by big commercial companies (South African Cities Network (SACN), 2015). For instance, farm inputs are only found in towns where they are supplied by commercial companies. Processed food in rural tuck shops is also produced and supplied by commercial companies. This alone indicates the lack of rural residents involvement in the food value chain. Without any institutional reorganization, it also presents an existing natural entry barrier for the inexperienced and minimally resourced rural youth. Thus, the potential gross margins and entrepreneurial opportunities that can be realized by rural residents are lost to the commercial companies. According to Haggblade *et al.* (2012), the only role that people in rural areas play within the agricultural value chain is through primary agriculture. It is then not surprising that, for rural youth, involvement in agricultural practices means taking part in primary agriculture.

The creation of an enabling environment for rural youth to actively participate in the agricultural value chain should be considered vital, not only for the revitalization of the sector but also for the development of rural people. This is because the potential benefits of their engagement in these activities will not be limited to themselves alone. There will be various benefits to the broader community through the backward and forward linkages, with multiple spill-over effects like job creation opportunities and skills development. Through the backward linkages, multiple potential investment opportunities can be initiated, including the increased demand for raw materials (farm produce) and technical skills critical for businesses along the agricultural value chain. Through the forward linkages, value-adding activities will result in convenient access to food for rural consumers. These linkages will collectively create a conducive beneficial environment for agricultural activities. In addition, Arslan *et al.* (2021) and Bello *et al.* (2021) highlighted that youth inherent unique cognitive abilities and desirable traits (such as creativity, innovative thinking, and flexibility) which are necessary for the transformation, development, and sustainability of the agricultural sector, especially in the era of the fourth industrial revolution.

To the best of the authors knowledge, there is hardly any empirical study on youth participation and /or interest in agricultural value chains in South Africa. Available studies (such as Baloyi, 2010; Lee *et al.*, 2012; O'Planick, 2016; Trienekens, 2011) focused on agricultural value chains in developing countries looking at opportunities and challenges for smallholder farmers in general, and not the youth. All these studies found that the lack of access to land for expansion, limited water for irrigation, the lack of modern irrigation systems, mechanization, transport logistics, and market information were the key constraints hindering smallholder farmers from participating in high-value markets along the value chain. It is clear that these and other studies not presented here do not focus on the youth. Thus, the study aims to close the identified gap in the literature and provide empirical insights on available opportunities and constraints hindering rural youth from engaging in agricultural value chains in South Africa.

2. Conceptual framework

Multiple factors can affect one's interest (decision thereof) to engage in economic activities, including those along the agricultural value chain. In this paper, economic activities along the agricultural value chain are taken as alternative means of making a living in agriculture. One theory that better explains the economics of the decision-making process is the theory of bounded rationality. According to the theory, decision-making in the real world is often complex and it is made under uncertainty which affects the ability of humans to adopt the optimal choices/decisions. The limitations of the human ability in knowledge and making correct computations about available choices prevent them from behaving in ways congruent to the predictions of the neoclassical theories (Simon, 1982: 279). In attempting to contextualize the theory, Hernández and Ortega (2019) noted that the desires individuals possess and the opportunities they think they have, affect how they make decisions even though they are not certain/fully knowledgeable about the choices available and the outcomes of the respective choices. That is, they may be unaware of other opportunities available

and in some cases, they believe that the available opportunities are favorable to them when in reality are not. The youth decisions about their career choices or where they want to operate along a chosen career path are boundedly rational because they are often made without the full knowledge of the possible alternatives and outcomes/consequences of each alternative. Given the lack of relevant information accessible to rural youth and limitations pertaining to their cognitive abilities to comprehend all the information, the study has assessed their decision-making (interest in agriculture or lack thereof) as a bounded rational decision.

Psychological capital defines the state of the mindset of the youth at a given point in time. The way youth view themselves and their perception of the world contribute to how they respond to daily events. When one is in a good psychological state, it enhances his/her ability to take up opportunities and to be resilient and proactive when faced with challenges and setbacks. It then becomes important to assess and understand the state of mind of the youth as one of the factors to explain their decision/choice (or lack of) to engage in agriculture-related activities. In the literature, psychological capital is often qualitatively represented using four dimensions, namely, optimism, hopefulness, efficacy, and resilience (Chipfupa and Wale, 2018; Luthans, 2004; Luthans *et al.*, 2007, 2015). This paper has attempted to measure and quantify this variable, following Chipfupa and Wale (2020) and Phakathi and Wale (2018). It is worth noting that this variable is often overlooked in most rural development literature (Chipfupa and Wale, 2018).

To complement the theory of bounded rationality, the study integrates another behavioral economics concept; the theory of reasoned behavior (TRB). According to TRB, perceptions (how people around you perceive a given situation/activity/choice) and social validation (how people endorse or invalidate a given activity/choice) affect the reaction towards a choice/action (Fishbein and Ajzen, 2011; Montano and Kasprzyk, 2015). How the youth perceive agriculture-related economic activities and the opinions of other people around them regarding agriculture are important in affecting their decision-making, particularly because youth are individuals that mostly derive their motivation and aspirations from the achievements, opinions, and practical experiences of people around them (Bernard *et al.*, 2014; Morrow *et al.*, 2005). This is the demonstration effect and social validation process that affect the decision-making process. In addition to the behavioral and psychological elements, the resource endowment of the youth is also essential in understanding their decision-making. For rural youth to actively engage in a typical agricultural activity, access to or ownership of natural assets (such as land and water) is necessary (Geza *et al.*, 2021). Furthermore, one needs to have access to financial assets that will enable them to purchase the necessary inputs, services, and technologies required to successfully initiate and manage agricultural activities along the value chain. Skills, training, and knowledge on how to manage and operate those activities are also necessary (Abdullah and Sulaiman, 2013). Access to markets and timely market information will require the youth to have access to physical assets such as mobile phones and motor vehicles, among others. Furthermore, according to Maluleke (2016), people normally prefer to buy from individuals or firms they know. This means that endowment in social capital (in the form of social networks and group membership) is also essential. The study employed this conceptual framework to investigate the factors affecting youth interest to engage in economic activities along the agricultural value chain.

3. Research methods

3.1 Study area selection

Data used in the study was collected from two districts in KwaZulu-Natal, namely, Amajuba and Umzinyathi. The two districts were selected because relative to other districts in the province: (1) they are characterized as rural with high levels of poverty; (2) according to the departmental officials with whom the research team had discussions, research fatigue among the youth is less prevalent in these districts as fewer studies have been conducted, relative to other districts in the province; This was confirmed through a quick rural appraisal undertaken before sampling and questionnaire pre-test; and (3) the two show great potential for rain-fed smallholder agriculture. Though recent statistics on youth employment at the district level are not available, provincial statistics show that about 46% of youth aged 15-34 years in the province are not in employment,

education, or training (Statistics South Africa, 2020). The province is the second worst-performing with regards to unemployment in the country and has the largest share of people living in poverty (Statistics South Africa, 2018).

Umzinyathi is located in the central north of the KwaZulu-Natal province, with an estimated population of 568,284 and an area size of 8,652 km^2 (Cooperative Governance and Traditional Affairs, 2020b). According to Umzinyathi District Municipality (2018) and Cooperative Governance and Traditional Affairs (2020b), the district is classified as one of the poorest and under-developed areas in the province with more than 29% of the population unemployed. Moreover, 84% of the district population resides in rural areas with more than 60% living below the poverty line and are food insecure. On the other hand, Amajuba district is located on the north-western side of the province, with an estimated population of 556,580 and an area size of 6,911 km^2 (Cooperative Governance and Traditional Affairs, 2020a). It has similar socio-economic characteristics to Umzinyathi district. It is predominantly rural with high level of poverty and food insecurity. More than 50% of its population lives in poverty with inadequate access to food (Amajuba District Municipality, 2015; Cooperative Governance and Traditional Affairs, 2020a). The biophysical conditions of the two districts are also similar. They have mild temperatures (annual mean of 15 to 20 °C) with moderate rainfall (annual average of 600-1,200 mm) which makes a conducive environment for both irrigation and rain-fed agriculture (Amajuba District Municipality, 2015; Brigid *et al.*, 2013). Agriculture is one of the primary employers in Umzinyathi while most of the people in Amajuba are employed in the manufacturing sector.

3.2 Sampling methods and data collection

Purposive and multi-stage random sampling were employed in collecting the data. The study purposefully selected youth (aged between 18 and 34) to participate in the survey. At the first stage of the multi-stage random sampling, two local municipalities were selected from each district. Following that, 200 youth, 50 from each local municipality, were randomly selected from the local database of about 500 unemployed youth provided by the local municipality offices. This method was primarily chosen because it provided a narrow framework of the geographically dispersed study site while providing a randomly selected sample that represented the population with minimal sampling bias. The primary data was collected in April 2019 through face-to-face interviews using structured questionnaires administered by five trained local enumerators fluent in both English and the native language in the study area (IsiZulu). A total of 152 rural young respondents were successfully interviewed. The collected data was coded, captured, and analyzed using the Statistical Package for Social Sciences 25 (SPSS 25, IBM Corporation, Armonk, NY, USA) and STATA 15 (Stata Corporation, College Station, TX, USA). All ethical considerations for the study were checked and approved by the Humanities & Social Sciences Research Ethics Committee of the University of KwaZulu-Natal (Protocol Reference No. HSS/1191/018).

3.3 Analytical framework

Due to the polychotomous nature of the dependent variable, multinomial logit (MNL) was employed to investigate the factors affecting rural youth interest to participate in different agricultural activities. The dependent variable was the different agricultural activities that youth showed interest to engage in. For this study, there were three available agricultural activities that rural youth were interviewed about to capture their interest (or otherwise): primary agriculture only', agricultural value-adding economic activities (AVAEAs) only', and the whole value chain (Figure 1). Because the study is not product-specific, the option primary agriculture only entails all the activities involved in the production stage of crop, vegetable, and livestock farming. AVAEAs only includes all the other value-adding activities outside the agricultural production stage such as retailing, buying and reselling of livestock, agricultural market agents, etc. The option whole value chain', due to a lack of a better word, simultaneously incorporates the two to represent the entire agricultural value chain. Considering the possibility that some of the youth might have no interest in any of the three options/activities, a fourth option was added – not interested in any agricultural activity'.

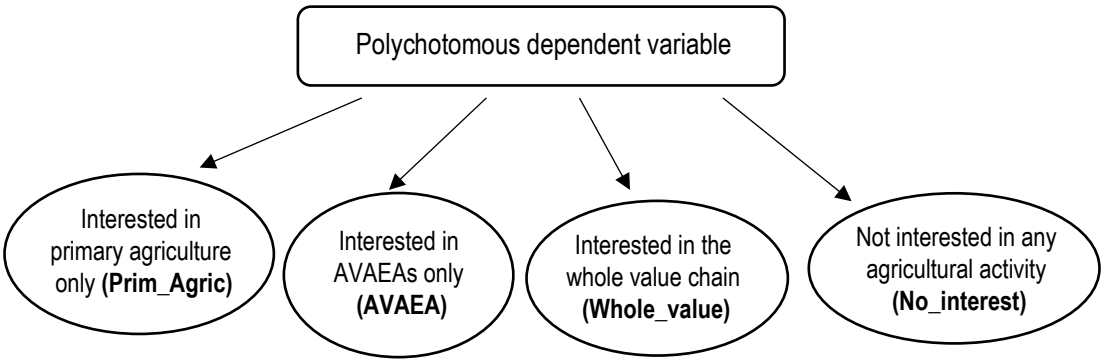

Figure 1. Structure of the dependent variable.

The question designed to capture the dependent variable had the form shown in Table 1.

Following Train (2009), the probability associated with rural youth being interested in engaging in any given agricultural activity is denoted by P_{nj} (j=1, 2, 3, and 4), where n represents the rural youth; j=1 represents the rural youth interested in engaging in agricultural activities in category 1; j=2 represents the rural youth interested in engaging in agricultural activities in category 2; and so on. If the unobserved portion of the utility (ε_n) is identically and independently distributed across alternatives, the MNL model can be specified as:

$$Pnj = \frac{e^{(\beta X_{nj} + YK_{nj})}}{\sum_{j=1}^{4} e^{(\beta X^{jj} + YK^{nj})}} \quad (1)$$

If the β_s and Ys are set to zero for one of the categories (for instance, category 4), the MNL model for each category (j≠4) can be expressed as:

$$P_{nj\ j \neq 4} = \frac{e^{(\beta X_{nj} + YK_{nj})}}{1 + \sum_{j=1}^{4} e^{(\beta X_{nj} + YK_{nj})}} \quad (j=1, 2, \text{and } 3) \text{ and} \quad (2)$$

$$P_{n4} = \frac{1}{1 + \sum_{j=1}^{4} e^{(\beta X_{nj} + YK_{nj})}}$$

where X_{nj} are the explanatory variables included in the model and K_n is a random disturbance term. The explanatory variables included in the model are described in Table 2.

Table 1. Structure of the dependent variable (survey questionnaire, April 2019).

	Activity	Please tick one box that is relevant to you
A	Interested in primary agriculture only	
B	Interested in AVAEAs only	
C	Interested in the whole value chain (A and B combined)	
D	Not interested in any agricultural activity	

Table 2. Description of the explanatory variables included in the multinomial logit model.

Explanatory variable	Description	Expected sign
Location	Location or study area 1 = Umzinyathi district, 0 = otherwise	+/–
Age	Age of the youth (years)	+
Age^2	Square of age	–
Gender	1 = male, 0 = female	–
Dependecy_ratio	Ratio of the sum of dependents (i.e. 0-14, above 65 years, permanently sick and/or disabled members of the household) to the working-age group (15-64)	+/–
Education	Years of formal education of the youth	+/–
Training	Agriculture-related training received (1 = yes, 0 = otherwise)	+
Land	Size of land the youth have access to (in hectares)	+
Credit	Access to loan (s) in the past 12 months (1 = yes, 0 = otherwise)	+
Household_Agric	Presence of a household member residing with the youth currently engaged in any agricultural activity (1 = yes, 0 = otherwise)	+
Social media	Do you have a social media account (WhatsApp, Twitter, Instagram, Facebook, etc.)? (1 = yes, 0 = otherwise)	–
LogICT	Natural log of the total monetary value of all the ICT assets (TV, radio, cell phones, laptops) that the youth have access to	+
LogHhldWealth	Natural log of the total monetary value of all the household assets minus the ICT assets	+
Pos_Psych	Positive psychological capital score (obtained by summation of scores from a five-point Likert scale of eight statements that are meant to measure the four constructs of psychological capital). The higher the score, the more the respondent in question is endowed with positive psychological capital (Table 3)	+/–
Perception_Agric	Perception score (obtained by summation of scores from a five-point Likert scale of four statements that are meant to capture rural youth perceptions regarding agriculture). The higher the score, the more the respomdent in question has positive perceptions about agriculture (Table 4)	+

Table 3 summarizes the statements used to measure the psychological capital of the youth. This was informed by previous studies including Chipfupa and Wale (2018), Phakathi and Wale (2018), and Chipfupa and Wale (2020). Table 4 below also provides a summary of statements that were used to quantify the perceptions that youth have on agriculture. The nature and format of the statements were adopted from Njeru (2017).

Table 3. Psychological capital constructs.[1]

Construct scenarios	Possible responses	Score
Hope and optimism		
(What would you do if you were interested in farming but had no access to land?)	• I would engage my family and friends to parcel/lend me land • I would engage traditional authorities/leaders to parcel/lend me land • I would wait until land is given to me • I would reapply when they re-advertise	
Resilience and persistence		
(What would you do if your job application was rejected multiple times)	• I would apply to a different place • I would stop applying	
(What would you do if you were running a non-profitable business?)	• I would continue with the business even if it was not making a profit and try to make changes • I would continue with the business even if it was not making a profit and seek advice • I would leave the business	
Self-confidence		
(What would you do if you were nominated for a leadership position?)	• I would accept a leadership position if elected • I would ask them to nominate someone else	
(If you had opposing views from that of the leadership of a group you are a member of, what would you do?)	• Agree with the leader to avoid conflict • Oppose the opinions not aligned with your beliefs	

[1] Code for all response: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree.

Table 4. Perceptions about agriculture.[1]

Perceptions of agriculture	Score
Agriculture is for both educated and uneducated people	
Agriculture can be profitable	
Youth can also engage in agriculture	
Agriculture can provide employment opportunities for young people	

[1] Code for all response: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree.

4. Results and discussion

4.1 Youth interest in economic activities along the agricultural value chain

Figure 2 shows the distribution of the dependent variable. It shows that rural youth have varying interests in different agricultural activities. The majority of the youth prefer engaging in the whole value chain and AVAEAs only relative to primary agriculture only'. Only 20% reported no interest in farming and related businesses. These findings are complemented by Chipfupa and Tagwi (2021) who found that there are youth typologies that show aspirations to partake in agricultural activities. These results are contrary to the general assertion that most youth are not interested in agriculture (Abdullah and Sulaiman, 2013; Abdullah *et al.*, 2012; Adekunle *et al.*, 2009; Igwe *et al.*, 2020). This can partly be attributed to one of the distinctive features of this study, making a distinction between primary agriculture and economic activities along the agricultural value chain. The findings demonstrate the need for aligning youth support in the sector to their heterogeneous interests.

Transportation of agricultural produce, tanning, retailing fresh produce, and supplying agricultural inputs were among the common AVAEAs that rural youth were interested in and would be able to engage in without major external support (Figure 3). This is because, according to the youth, these activities are relatively easy to initiate and need low financial investments and minimal skills training. However, according to O'Planick (2016), transportation of agricultural produce is deemed to be less sustainable as it is seasonal and has less

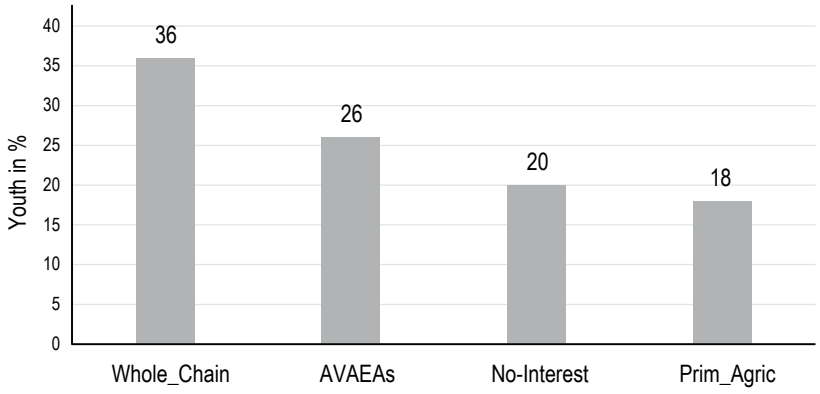

Figure 2. Youth interest in economic activities along the agricultural value chain (survey data April, 2019).

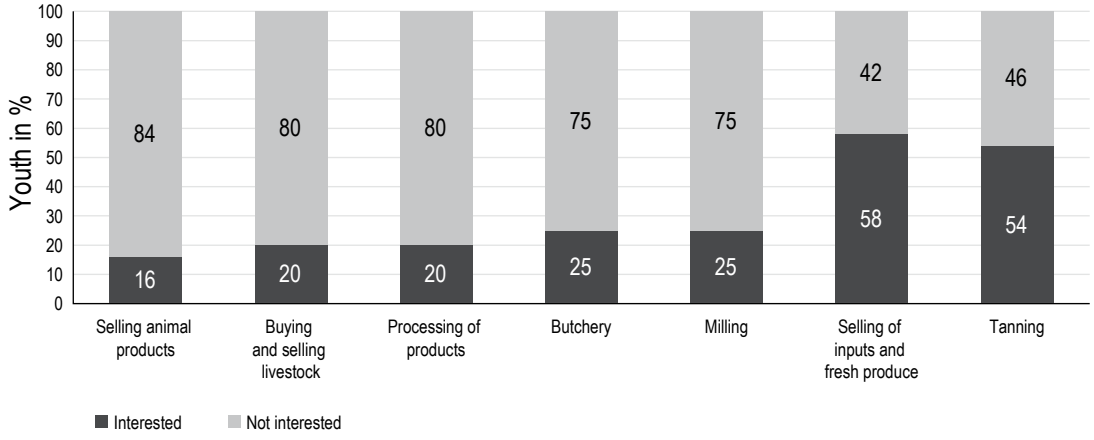

Figure 3. Rural youth interest in agricultural value-adding economic activities (survey data April, 2019).

profit margins compared to transportation of passengers (taxi driving). Thus, such an activity might attract the youth seasonally, but its sustainability remains questionable. Buying and selling of livestock/selling livestock products were the least of the AVAEAs that rural youth aspired to engage in. This is because of the high rates of livestock theft in the area and the fear that their livestock will be consumed by their families without their permission. Given that the study was not product-specific, the above-mentioned activities are broad elements of the agricultural value chain and should serve as a guide when formulating programs and/or strategies aiming to attract rural youth into the sector.

Insufficient financial resources, lack of skills, and lack of the necessary equipment were among the leading constraints identified by the rural youth to be hindering them from initiating AVAEAs (Figure 4). This is in line with findings in other studies which identified finance and lack of skills/knowledge as the main constraints limiting youth engagement in agribusinesses (Giuliani *et al.*, 2017; Magagula and Tsvakirai, 2020). The MNL results presented in Section 4.3 provide a detailed analysis of the factors hindering rural youth from engaging in agricultural activities.

4.2 Model specification

To test for the validity of the MNL model, several tests were conducted. Multicollinearity was checked using the variance inflation factor (VIF). The mean VIF was 1.40, indicating the absence of multicollinearity in the data. Also, a Breusch-Pagan/Cook-Weisberg test for heteroskedasticity was conducted. An insignificant result (χ=0.00; P<0.94) suggests that the standard errors from the estimation of the model were homoscedastic. The Hausman-McFadden test for the independence of irrelevant alternatives (IIA) was also conducted to check for the mutual exclusivity of the categories included in the dependent variable. The results of the test fail to reject the null hypothesis that an additional category will not change the probabilities of the existing categories (χ=0.91; P<1.00). This means that the categories of the dependent variable are mutually exclusive.

4.3 Multinomial logit regression results

Table 5 presents the results of the MNL model estimation. The unstandardized β estimates and the marginal effects (dy/dx) measure the influence of the explanatory variables (odds ratio and likelihood, respectively) on the dependent variable, *ceteris paribus*. The base category for the model is category 4, i.e. 'No_interest'. The study results suggest that age of the youth, access to resources and services (agricultural training, land, and information and communication technologies), and having a household member engaged in agriculture

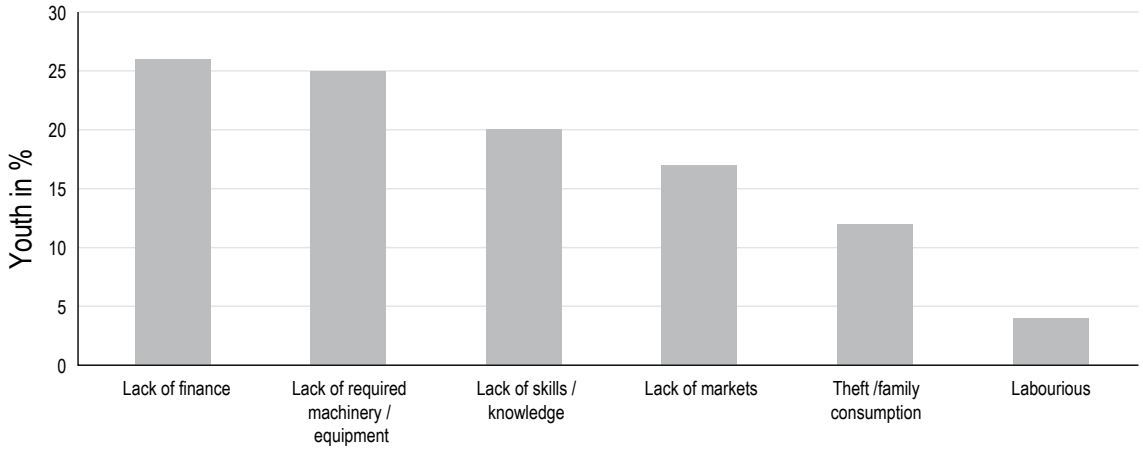

Figure 4. Perceived constraints hindering youth participation in agricultural value-adding economic activities (survey data April, 2019).

Table 5. Multinomial logit regression results (survey data April, 2019).[1]

	Prim_Agric		AVAEAs		Whole chain	
Explanatory variable	**β**	**dy/dx**	**β**	**dy/dx**	**B**	**dy/dx**
Location	0.502	0.072	2.509***	0.287	0.389	0.113
Age	-0.133	-0.007	-0.140	-0.012	-0.013	0.012
Age[2]	3.23e-15**	2.40e-16	1.40e-15	5.71e-18	1.01e-15	6.78e-17
Education	-0.459**	-0.011	-0.650***	-0.036	-0.516**	-0.016
Gender	-0.554	-0.044	0.041	0.54	-0.5422	-0.040
Dependency_ratio	-0.012	0.043	-0.310	0.005	-0.772**	-0.090
Household_Agric	4.526***	0.152	4.583***	0.220	3.207***	0.020
Credit	-2.951*	-0.100	-2.875**	-0.122	-2.199*	0.112
Training	0.861	0.157	2.876***	0.162	3.090**	0.230
Land	-0.488	-0.089	0.297	0.025	0.607*	0.090
Perception_Agric	-0.176	-0.015	-0.167	-0.020	0.100	0.031
Pos_Psych	0.658	0.039	0.490*	0.025	0.623**	0.056
Social_media	-1.670*	-0.113	-1.792**	-0.186	0.375	0.224
LogHhldWealth	-0.320	-0.005	-0.179	-0.037	-790***	-0.088
LogICT	0.312	0.016	0.639*	0.039	0.541	0.026
Number of observations = 152						
Likelihood ratio test: chi-square = 152.3, df = 42, *P*-value = 0.000						
Log likelihood = -128.5						
Overall % youth correctly classified = 78.2%						

[1] *, ** and *** denote statistical significance levels at 10, 5 and 1%, respectively.

[2] The base category is category 4 (youth not interested to participate in any agricultural activity).

positively affect youth interest to engage in different agricultural activities. On the other hand, access to other resources and services (formal education, social media, finance, psychological capital, and wealth) and dependency ratio negatively affect this interest. This suggests that, generally, better educated, entrepreneurial, and relatively well-resourced young people are aspiring to be in economic activities outside agriculture.

The variables that are statistically significant in all three categories relative to the base category are household_ agric, education, and access to credit. Having a household member currently engaged in any form of agricultural activity increases the likelihood of youth being interested in participating in primary agriculture, AVAEAs, and the whole value chain by 15, 22, and 2%, respectively. Having some form of previous exposure and experience in agriculture reduces their risk perception. Young people without any exposure or experience in agriculture find it difficult to venture because they do not know what it entails and what they can expect. That is why they will find it difficult to invest their meager resources. The results are in line with Morrow *et al.* (2005) and Casson and Giusta (2007) who found that decisions and aspirations of the youth are derived from the actions, successes, and failures of people around them. Both of these studies found that youth from households headed by successful entrepreneurs were more willing to initiate their own businesses relative to their counterparts. Nnadi and Akwiwu (2008) found that rural youth who participated in agricultural activities were those whose parents were already involved in agriculture. Although questions as to whether their participation was voluntary or not remain unanswered, this illustrates the role of the demonstration effect in the decision of rural youth engaging in agriculture.

Formal education significantly decreases the probability of rural youth interest to engage in primary agriculture, AVAEAs, and the whole value chain by 1, 4, and 2%, respectively. This means the higher the level of formal education, the lesser the youth's interest in agricultural activities. The study results are in agreement with the findings by Bezu and Holden (2014) and Igwe *et al.* (2020) who both found a positive correlation between formal education and income/livelihood diversification. According to Igwe *et al.* (2020), years of schooling

were significant determinants of income diversification among farmers in Nigeria. In addition to this, the authors indicated that the respondents of their study indicated that formal education attainment negatively affects young farmers involvement in farm activities and may directly or indirectly affect young people's motivation to be farmers. However, these findings are in contract to findings by Nnadi and Akwiwu (2008) who found education to have a positive relationship with youth participation in agriculture. The reason for this finding in this study might be contextual given the major economic activities in the study districts. For example, in Amajuba, the common thriving economic activity is manufacturing, which is more preferred by relatively educated rural youth compared to agriculture. Also, better-educated youth may believe that they stand a better chance of getting more rewarding employment in other sectors relative to their uneducated counterparts. The difference in economic activities in the two districts is also highlighted by the significance of the variable Location. The results indicate that youth who reside in Umzinyathi are 29% more likely to be interested in participating in AVAEAs compared to those from Amajuba.

Furthermore, rural youth who have previously accessed credit are less likely to be interested in participating in any agricultural activity relative to rural youth in category 4. Their likelihood decreases by 10% for primary agriculture only, 12% for AVAEAs only, and 11% for the whole value chain. Considering that the credit in question is a formal loan with stringent requirements (such as from the bank), the negative relationship might be that youth who qualify for such loans are those already employed in other sectors or those who have already initiated other businesses. This would explain their lack of interest to participate in agricultural-related activities. If it is informal credit, which mainly happens to be for consumption purposes, the beneficiaries are desperate and poor, trying to make up for their food shortages using such desperate measures. Their failure or the failure of their family to make a decent living from agriculture has made them consider agriculture a non-viable sector.

Access to social media (WhatsApp, Twitter, and Instagram, among others) significantly decreases rural youth interest in engaging in primary agriculture only and AVAEAs only', relative to participating in none. This is expected given that, currently, there is very little agricultural content on these platforms. Most of the information typically found on social media platforms that attract the attention of the youth is related to entertainment, celebrities, and luxurious lifestyles. This has kindled the desires of the youth for such lifestyles through professional/unprofessional careers that will give them a life depicting that of their role models. However, most of these aspirations remain unrealized as they are just desires without the required skills and endowments. The youth are preoccupied with unrealistic ambitions that block them from taking advantage of locally available low-status agricultural or non-agricultural livelihood opportunities. The mismatch between their endowments and ambitions is one major reason for increasing youth unemployment, particularly in rural areas. Access to primary ICT assets (like radio and television) significantly increases interest to take part in AVAEAs only by 4%. This is because the social media content and the way it is packaged is dictated and controlled by the preferences of the users while that displayed on TV and radio is not. Youth with access to TV and radio have access to a variety of information, including agricultural programs like Living Land on SABC 2. This is an example of an agricultural show that presents various opportunities within the sector, mostly interviewing successful agripreneurs'.

Rural youth endowed with positive psychological capital are more likely to show interest in AVAEAs and primary agriculture by 3 and 6%, respectively. Given the demanding nature of the work and the volatile nature of income in the agricultural sector, only youth who are endowed with positive psychological capital are more likely to have the psychological and emotional strength to navigate the ups and downs and succeed in agriculture. Moreover, considering the general negative attitude that youth have towards agriculture-related activities, it will require youth with better psychological capital to choose to overlook the challenges involved and pursue opportunities in agriculture, despite the prevailing constraints.

Agricultural training significantly increases the probability of rural youth being interested in AVAEAs and the whole value chain by 16 and 23%, respectively, relative to engaging in none. This is in line with findings by Adekunle *et al.* (2009) who indicated that lack of skills hinders youth involvement in agricultural

activities. Also, the results indicate that rural youth who have access to land have an increased probability of engaging in the whole value chain by 9%. This is as expected as land has been identified by studies in the past as one of the major constraints affecting youth participation in agriculture. This is one of the most consistent findings in the literature (Abdullah *et al.*, 2012; Baloyi, 2010; Bello *et al.*, 2021; Bezu and Holden, 2014; FAO, 2014; Gichimu and Njeru, 2014). The cultural norms of the study area dictate that land is allocated to married people. In cases where land is seldom allocated to the youth, males get the priority. In addition to this, inherited land is also said to belong to the eldest male child of the family. Such practices become inherent and entrenched constraints for young unmarried females with potential interest to engage in agriculture. Empowering young women and addressing the prevailing gender bias has to, therefore, be a priority in rural development policy agenda. One of the attractive features of engaging the rural youth in value-adding economic activities along the food value chain is that land is not a constraint to pursue these opportunities. This is important in the context of rural South Africa where traditional leadership still has immense role in rural land tenure arrangements which do not favour young people. Given the entrenched nature of the influence of traditional leaders, the *status quo* is unlikely to change in the foreseeable future.

The results further show that an increase in household wealth will decrease the likelihood of youth interest to engage in the whole value chain by 9% compared to not participating in any agricultural activity. This finding is in line with Zizzamia (2018) who highlighted that youth or young adults', as the author refers to them, who have financial support from their families are more likely to wait for what they perceive as better jobs than taking up jobs in agriculture. Moreover, youth from wealthier families have the resources (and relevant networks) to explore non-farm opportunities in urban areas. However, the results differ from Bezu and Holden (2014) who found that Ethiopian youth from families with relatively high asset value preferred farming as a livelihood strategy. In their reasoning, the authors stated that such youth have the necessary resources to take advantage of agriculture-related opportunities around them. Moreover, the youth from such households will have better trust in agriculture as a livelihood strategy as they have seen farming to have been the basis for accumulation of wealth. The difference in the findings might be attributed to contextual differences among the study areas. Such differences could emanate from the importance of agricultural enterprises (livestock, food crops, cash crops, etc.), soil quality, and endowment in agriculture-related assets. While smallholder agriculture is a full-time job in most rural areas of Ethiopia, it is not taken as such in South Africa. Both studies, including this one, did not separate agricultural assets from total household assets. Youth from a wealthier family that is endowed with more agricultural assets might have the interest to engage in agriculture and utilize the assets. Moreover, youth from a wealthier family not endowed with agricultural-related assets might not be interested to engage in agriculture. Youth in this study are mostly from households that are not well endowed with agricultural assets.

The higher the number of dependents (children, members who do not have labor contribution for health reasons, and elders) in a household (labor-constrained households), the lesser the interest of the youth from such a household to engage in the entire agricultural value chain. Yobe *et al.* (2019) also found that households with more dependents were less likely to choose an agriculture-centered livelihood strategy. The most probable reason is that more dependents require or demand more time from the productive members of a household (including youth) in unpaid care responsibilities (also known as household chores) including monitoring. This leaves them with less remaining time to engage in other economic activities, including agricultural activities. Todes *et al.* (2010) and Mutenje *et al.* (2010) have also reported that dependency ratio has a significant influence on economic activities that household members choose to take part in. According to Mutenje *et al.* (2010) for subsistent smallholders/unskilled workers in Zimbabwe, typically with higher dependency ratios and high dependence on transfers, 79% of their income is derived from off-farm casual labor. Todes *et al.* (2010) found that households with more dependents relied more on social grants. Yobe *et al.* (2019) also found that households with high dependency ratio have mixed farming/migration/social grant livelihood strategies, further highlighting their preference for a diverse livelihood strategy relative to an agriculture-dominant strategy.

The square of the variable age shows some very interesting results regarding youth interest to participate in primary agriculture only. It indicates that age and rural youth interest to engage in primary agriculture have a u shaped relationship. This means that initially, youth interest to engage in primary agriculture decreases until a certain age and then starts to increase again as the youth gets older. This suggests that at a younger age, the youth might have hope and aspirations of getting employment in other sectors. As they get older, they realize the limited opportunities and increased responsibilities that come with it and are left with no choice but to resort back to primary agriculture. Thus, their participation in agriculture in the later years of their youth is driven more by necessity rather than interest.

5. Conclusions and policy implications

Over the years, agriculture has been at the forefront of development and employment creation in most rural areas. Nevertheless, recent studies have indicated a descending trend in the sector's succession plan. Available empirical evidence has attributed the lack of youth interest and participation to be the primary cause of this. However, most of this research focuses on primary agriculture largely ignoring the possibility that rural youth might be interested in other activities along the agricultural value chain. Hence, this study aimed to investigate: (1) which types of agricultural activities are rural youth interested in; and (2) what kinds of factors flourish or deter this engagement.

Youth were found to have the interest to engage in all activities along the agricultural value chain. However, in relative terms, they prefer to engage in activities higher up the agricultural value chain or a combination of primary agriculture and economic activities along the agricultural value chain. This suggests that the blanket conclusion that youth do not have preference for agriculture, including primary agriculture, is not a true reflection of the reality about the youth in KwaZulu-Natal and the rest of South Africa. Furthermore, the empirical results suggest that factors affecting their interest in different agricultural activities are relatively similar, and mostly emanate from their limited resource endowment. Thus, improving the resource base of the rural youth should be a starting point for strategies that seek to address the challenge of limited youth participation in the agricultural sector.

Institutional amendments, particularly cultural practices concerning land allocations, should be addressed. Youth, regardless of marital status and gender, should be allowed the same opportunity to inherit, borrow, lease, and where possible, purchase agricultural land without any restrictions. Initiatives aiming to change rural land policies should engage traditional leaders to find a common ground on ways and means of ensuring equal access to land by the rural youth. Also, there is a need to pave the way for institutional transformation that will improve youth access to production credit as an enabling factor for their participation in agriculture, considering the need for capital investments in initiating sustainable agricultural activities, particularly value-adding activities. Developing micro-finance programs that will offer production credit packages with requirements that can be met by a typical rural youth with payment arrangements that are in line with the repayment capacity of the rural youth is necessary.

Furthermore, the introduction of skills development programs to equip rural youth with the necessary agricultural skills (non-cognitive and practical skills) is vital. Such programs should include practical agricultural training, business/farm shadowing initiatives, and on-site mentoring programs, among others. The study has also shown the importance of social capital, particularly the demonstration effect of the success (or lack thereof) of smallholder agriculture in attracting or deterring the youth to agriculture. The promotion of success stories in agriculture on social media platforms will play an important role, as such platforms play a crucial role in information dissemination among the youth. Improving the youths social capital should, in essence, be the responsibility of the youth themselves. However, interactive initiatives (such as seminars, indabas, and workshops) that engage successful people in agriculture and agribusiness will contribute significantly to the social capital of the youth, particularly for those with no family members currently engaged in the sector.

Overall, it should be noted that the creation and implementation of the various recommended strategies will not be of much assistance without, first, the mentality and attitude transformation from the youth themselves concerning agriculture. They have to align their ambitions and mindsets to the realistic opportunities on the ground and their resource endowments. Strategies around the creation of an enabling environment and adaptation of technology-intense practices in an effort to make agriculture more youth-friendly and less physically demanding are desirable. However, such interventions are not realistic and applicable, especially in rural smallholder farming constrained by various institutional, biophysical, and resource endowment factors. At the macro-level, such interventions will have a negative impact on rural youth employment, replacing unskilled labor with machinery. Future research should focus on *ex-post* investigations and adopt a revealed preference approach to measure variables like psychological capital and perceptions. There is a need to examine the extent to which government youth-targeted programs have contributed to reducing youth unemployment. In addition to this, future research should be product-specific to understand the contextual factors relevant to specific agricultural enterprises, both on-farm and along the food value chain.

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