





Evaluating factors influencing youth participation in agricultural enterprises: Implications for food security and agribusiness



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Background: Agriculture is crucial for economic growth, yet youth engagement in agricultural enterprises is declining due to concerns related to perceived profitability, resource access, and social stigmas. Understanding these determinants is vital for fostering youth interest in agriculture and promoting sustainable rural development and food security.

Aim: This study examines the factors affecting youth engagement in agricultural enterprises in Umzimvubu Local Municipality, South Africa, and their implications for food security and agribusiness.

Setting: Addressing youth unemployment and enhancing agriculture's contribution to gross domestic product (GDP) require understanding barriers to youth participation. This study was conducted in Umzimvubu Local Municipality, South Africa.

Methods: A structured questionnaire was administered to 210 youths through stratified random sampling. Descriptive statistics and a univariate probit regression model were used for analysis.

Results: Findings indicate male dominance in agriculture, with educational background positively correlating with participation. Single youths showed greater interest than married counterparts. Challenges like land availability and a lack of financial support hinder engagement. Significant determinants include age, education, farming skills, social group membership, and household revenue, while factors like household size, gender, and limited access to credit negatively impact willingness to participate.

Conclusion: Addressing financial barriers through improved access to loans is essential to enhance youth involvement. Policies should cater to youth-specific traits and environmental challenges to build a resilient agricultural sector driven by young innovators.

Contribution: The study emphasises the need for a comprehensive policy framework collaboratively developed by the government, the Department of Agriculture, and non-governmental organisations.

Keywords: agricultural enterprises; youth engagement; economic growth; food security; Umzimvubu Local Municipality; determinants; willingness; interest; rural development; policy framework.

Introduction

The agricultural industry is regarded as a dominant job creator in emerging commercial centres, and it is critical to most developing countries' economic growth and poverty alleviation goals (August 2020). The agricultural sector is the only sector that ensures global food security, particularly in small-earning countries where farming is the fundamental source of income (Mokgomo, Chagwiza & Tshilowa 2022). To maintain agricultural growth, it is essential to inspire young individuals and their engagement in agricultural enterprises (Etim & Udoh 2020). Youths are essential assets for every country (specifically in South Africa), notably for maintaining agricultural output, which is a critical industry for enhancement (Kimaro, Towo & Moshi 2015), so their large population must be managed appropriately. Young people hold the capacity to address a few of the significant barriers to expanding farm output in the nation, as young people are generally more transparent on new concepts and techniques than aged cultivators (Daum & Birner 2017). Regrettably, this group of people is not considered in policy and programme considerations. As a result, there are several factors accountable for the poor engagement of youths in agriculture such as insufficiency of land, capital, trading centres, experiential learning

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and motivations (Kimaro et al. 2015), yet limited research has been conducted.

Agriculture is a significant sector for the sustainable commercial growth and public security of all growing nations in the world (Mthi et al. 2021). This is a fact because agriculture is the main employment avenue in emerging commercial centres and performs a significant responsibility in commercial development and social welfare enhancement in most countries, especially in sub-Saharan Africa (Modi 2019). Henning et al. (2022) further specified that agriculture serves as a global livelihood source for 60% – 80% of people and significantly contributes to revenue and economic growth, as many individuals derive their livelihoods from agricultural activities. Agriculture stands as one of the best optimistic industries in sub-Saharan Africa (SSA), capable of employing youth and alleviating poverty (Henning et al. 2022). It is estimated that the farming sector accounts for 35% of total employment in the world and 86.8% in the African continent, as well as supplies currency trading, food and nutritional well-being. Karimou (2018) recommended that these rewards call for financial commitment in the farming industry as the central influence of commercial development. Additionally, Ntshangase (2016) specified that agriculture is the only resolution to numerous social and economic problems confronting South Africa, especially among the outlying regions in which agriculture seems to be practised.

Despite farming's significant input to the economy of developing countries, particularly SSA, the sector faces some serious constraints, such as the fact that agricultural production is still entrusted to elderly cultivators, who presently compose most of the rural agricultural workforce (Kwenye & Sichone 2016). Youth involvement in agriculture has decreased over time, which hurt the agricultural economic system. The elderly's agricultural production cannot match the swiftly rising population's food and fibre requirements (Kwenye & Sichone 2016). Youth participation has been insufficient, irregular and unreflective of the sector's previous commitment (Magagula & Tsvakirai 2020).

There are government-led schemes and policy reforms that were developed to promote young people's engagement in farming industries such as the Rural Development and Land Reform Agriculture Youth Development Initiative for South Africa of 1998, Youth Empowerment Strategy of 2008 (FANRPAN 2012), Youth in Agriculture and Rural Development (YARD) and newly, the National Policy for Beneficiary Selection and Land Allocation of 2020. Nevertheless, youth participation remains the problem regardless of these campaigns that recognise the significance of involving young people in farming (August 2020).

Some distinct reasons and barriers have been identified as the cause of poor youth involvement in agricultural enterprises, which include scarcity of agricultural loans, restricted authority subsidy and shortage of knowledge, information and connection technology (ICT) (Yami et al. 2019). Additionally, young people encounter several

challenges, including insufficient training programmes and instruction to further grow and sustain their abilities, inadequate technology and expensive and shortage of agro-inputs (Banga, Njambi-Szlapka & Phiona 2021). Other obstacles resulting to poor participation in farming include the absenteeism of functional farmer organisations, lack of access to credit, scarcity of land governance, lack of extensive hydrological resources improvement initiatives and limited expertise and proficiency in farming (Ntshangase, Muroyiwa & Sibanda 2018). Also, there is a broad scarcity of core competencies in the farming sector; the structure of the Ministry of Agriculture and Cooperatives (MoAC) has been slow to respond to the nation's need for technological assistance. The farming sector lacks market responsiveness, and suitable policies are scarce. Additionally, there are deficiencies in capacity and unproductive distribution organisations, which further hinder effective agricultural development. Young people also encounter problems like unproductive agricultural advisory services of the MoAC, inadequate marketing framework, excessive expenditure of foreign inputs and reduced product costs and scarcity of breeding materials and feeder stock.

Even though agriculture has the potential to handle youth employment and poverty alleviation, the youth still have no interest in agriculture as the sector has been left with the elderly and illiterate population (Mama 2020; Ouko et al. 2022). Consequently, agricultural productivity has been declining over the years. Furthermore, youth largely do not participate in agriculture because agriculture as a career choice is weighed down with misconceptions such as agriculture is for the poor and it is backbreaking work with low returns (Afande et al. 2015; Daum & Birner 2017; Mulema et al. 2021; Udemezue 2019; Yami et al. 2019). Moreover, rural youths are migrating to big cities with little success in getting decent employment ending up worsening the unemployment statistics (Zidana, Kaliati & Shani. 2020). Also, non-agricultural sectors have not been able to provide sufficient employment opportunities for youths (Dolislager et al. 2021). Consequently, youth struggle to meet their daily needs and some get involved in illegal activities for survival (Alabi, Famakinwa & Ogunmokun 2023). Furthermore, this results in higher unemployment, underemployment and extreme poverty among young people (Mncayi 2020). Recent studies accentuate that insufficient employable skills, inadequate investment and inconsistency between the demand for labour and the youth's skills contribute to the affliction of youth unemployment (Ayonmike & Okeke 2016; Brundage & Cunningham 2017; Kabbani 2019). These factors produce ill-prepared youth labour force to compete in the labour market and hinder their employability (Geza et al. 2021).

Most studies have been conducted on youth engagement in farming (Ahmed & Ahmed 2021; Bezu & Holden 2014; Boulanger et al. 2019; Getahun & Fetene 2020). Some of these studies focused on the perceptions of youth on agricultural enterprise (Adeyanju, Mburu & Mignouna. 2021; Magagula & Tsvakirai 2020; Simões & Do Rio 2020), whereas some studies focused on the barriers and opportunities of young people's

participation in farming (Dietershagen & Bammann 2023; Mulema et al. 2021). There is limited information on factors affecting youth participation in agriculture. Therefore, this research investigated the determinants of factors that influence youth engagement in agriculture.

Theoretical framework: Role model theory

Role model theory suggests that people are more likely to understand behaviour by perceiving others instead of comprehending the consequences of their own actions (Paisley 2018). For example, young people are more expected to adopt many of their beliefs and behaviours by inspecting elders in their surroundings. Beyond mere exposure, Zainal and Leta (2021) argued that young adults tend to identify individuals whose behaviours they find more admirable. Youth who have role models are more inclined to pay attention to the actions of role models who are being recognised than people in their surroundings (Van Auken, Fry & Stephene 2006). Additionally, as adolescence is a span where identity development begins, young people often look up to elders to figure out suitable and acceptable actions and to discover mentors they aspire to emulate (Erikson 1968). Mentors who mostly possess a positive influence on young people are recognised as holding high image, control and good reputation (successful) (Bandura & Barab 1971). However, the viewer's perceptions of these traits and the degree to which they are influenced by their role model can be different depending on the population and the context.

The role model theory highlights how youth's decision is influenced by role models (Hornbeck & Salamon 1991). Youth having access to role models like successful young farmers will be advantageous as it will help youth gain some knowledge and experience in agriculture. Several researchers (Deakins et al. 2005; Kirkwood 2017; Etim & Udoh 2018) have identified that role models will have a positive influence and outcomes among young people. Werner (1995) noted that favourable mentors function as guarding determinants that contribute to adaptability in high-risk youth. Her findings showed that most resilient individuals are likely to have similar gender role models. Bryant and Zimmerman (2003) stated that having favourable role models around one's family or in society can safeguard youth from unfavourable psychosocial exposures. Particularly, the study showed that urban youth who had female role models revealed greater psychological well-being compared to those without role models. Furthermore, youth who had male role models (especially paternal figures) showed better academic achievements than those who did not have mentors. Yancey, Siegel and McDaniel (2002) found that young people with acknowledgeable mentors obtain good marks, increase self-confidence and show more powerful beliefs and identities than those who do not have mentors.

Noteworthy, they established that the positive impact of role models is stronger when young people have a personal connection with them. McMahan (2004) revealed that young people having role models are connected to decreased

aggressive behaviours, anxiety and depression. Hurd, Zimmerman and Xue (2009) acknowledged that young people with role models are less likely to be affected by unfavourable influence from external elders, leading to diminished psychological distress and violence. Additionally, youth with role models presented more favourable educational results. Collectively, these findings support the notion that role models foresee favourable results for youth.

Methodology

Description of the study

The study was carried out in Umzimvubu Local Municipality under the Alfred Ndzo District in the Eastern Cape province. Geographically, the Eastern Cape is the second largest province behind the Northern Cape. The reason for its selection was that the province houses the second most farmers practising crop and livestock farming after KwaZulu-Natal province (DAFF 2020). The province further boasts about its agricultural activities (crop, livestock, citrus, sugarcane and vegetable farming) and tourism sectors, which also contribute to the general province's gross domestic product (GDP). Meteorologically, the Eastern Cape province is characterised by a semi-arid rainfall pattern particularly in the inland regions, favouring livestock farming. According to Stats SA (2016), farmers in this province receive agricultural support from the government, the private sector and other institutions. Additionally, Norton and Alwang (2020) asserted that public sector-led extension service remains the dominant source for technical information delivery for many of these smallholder farmers.

Research design and approach

This research utilised a cross-sectional research design. This research implemented both quantitative research approaches. This was essential because it ensures data triangulation, and shortcomings of individual sorts of information are offset by the strong points of another. Moreover, it helps to ensure that understanding is enhanced by integrating diverse means of knowing.

Sampling approaches and data collection techniques

The population of the youth in the local municipality (80467) was selected for sampling purposes. The selected population of young people (44257) participating in agricultural enterprises was drawn from the youth population.

The sample size of the study was calculated using Equation 1 below:

$$N = \frac{z^2 \times p(1-p)}{e^2} = 384 \quad [\text{Eqn 1}]$$

Kothari (2004) noted that n is the sample size, z is the value of standard deviation at a 95% confidence level (in this case 1.96), 3 is the level of precision ($\pm 5\%$), p is the sample proportion in the target population, $q = 1 - p$ and N is the size

of the population. Therefore, the sampling size of the study was 210. The sampling was determined based on the proportion of participating youth relative to the total youth population within the local municipality. Thereafter, the identified value was subsequently multiplied by the sample size obtained using Equation 1, as specified above.

The study utilised a stratified random sampling procedure and managed to sample 210 respondents. The sample included both male and female individuals, aged 18–35 years, engaged in varied agricultural and non-agricultural occupations. Primary data were gathered over an interval of 2 months by applying a structured questionnaire. The information included socio-economic characteristics of farmers such as household income, demographic variables and farm-specific variables, such as farm size, crop types, livestock types, soil quality, technology and equipment. In this study, several measures were taken to ensure the reliability and validity of the findings. These include the research instrument; a structured survey was developed based on a comprehensive literature review. Furthermore, the research procedures were standardised across all participants, and detailed protocols for administering the survey and conducting the training were established and followed to ensure uniformity in data collection.

Empirical model specification

A univariate Probit regression model was applied in determining the aspects possibly affecting the willingness and interest of youth's participation in farming activities. The aspects that were identified by young people that impact their determination to engage in agricultural activities could be effective for product design, integration and sales. This model has been experimentally employed in literature (Falusi 1975; Etim & Benson 2016; Hailu 1990; Rahm & Huffman 1984). The observed model for willingness to engage in an agricultural enterprise (Equation 2) is designated as:

$$Y_i^* = P(Y_i = 1) = \beta x_i + \varepsilon_i \quad [\text{Eqn 2}]$$

where Y_i = 'willingness to engage' (WTP) in agricultural enterprises; Y_i^* = estimated value of Y_i ($Y_i^* = 1$) if $Y_i > 0$ and ε_i is the error term that follows a normal distribution (mean $\mu = 0$, variance $\sigma = 1$). P is the probability function and β is the vector of factors to be estimated. X_i is the matrix of explanatory variables that impact the i th young people's determination to be willing to engage in farming enterprises. The dependent variable Y_i or WTP takes a value of 1 for cultivators who are willing to engage in agricultural enterprises and zero otherwise.

Data

The collected information is presented in Table 1.

Ethical considerations

Ethics approval was obtained from the University of KwaZulu-Natal's Humanities and Social Science Research

Ethics Committee (HSSREC) with ethical clearance number HSSREC/00005088/22.

Results and discussion

The major outcomes of the study are deliberated in this section. A description of the aspects that impact the willingness and interest of young people in agriculture is presented. The findings from the Probit model estimation will be presented here along with the discussion. This section provides a detailed examination of the study's key outcomes, focusing on the factors influencing the willingness and interest of young individuals in agriculture. It includes an analysis of the findings derived from the Probit model estimation, accompanied by a comprehensive discussion of these results.

Socio-economic characteristics of youth

Table 2 represents the socio-economic traits of youth engaging in farming practices. The study results reveal that males are the most dominating gender when it comes to youth involvement in agriculture with a mean age of 27 years. This is the case because of the perception that agriculture is demanding and requires energy to operate, which scares females from participating. These results aligned with the findings of Douglas, Singh and Zvenyika (2017), Bergman et al. (2019), Mujuru et al. (2022) and Thibane et al. (2023) that males dominate agricultural enterprises as they easily get information from their counterparts, unlike females. The study further shows that youth participating in agriculture are literate as they have secondary education as they spend more than 11 years in school in attaining skills and knowledge, which plays a pivotal role in operating the agricultural enterprise as well as knowing the reasons for participating in farming activities. Secondary education contributes significantly to the skills and knowledge required for successful participation in agriculture. These results further state that being educated was beneficial to farmers in terms of adopting new innovative techniques and they were able to interpret agricultural information that benefitted the

TABLE 1: Relationships between dependent and explanatory variables of the Probit model.

Variable	Variable description	Method of measurement	Expected sign
AGE	Age of household head	Number in years	±
GEN	Gender of household head	0 = Male, 1 = Female	+
EDULVL	Number of years in school	Actual number in years	+
HHSZE	Number of household members	Actual number in years	±
MARSTA	Marital status	0 = Single; 1 = Married; 2 = Divorced; 3 = Widowed	±
HHINC	Household income	Actual number in ZAR	±
LOWSHIP	Land ownership	1 = Own land; 0 = Otherwise	+
FRMSIZ	Total land owned by farmer	Actual number of hectares	±
DISTMKT	Distance to the market	Distance in km	+
ACCCRE	Access to credit	1 = Yes; 0 = No	+
ACCEXT	Access to extension services	1 = Yes; 0 = No	+
GRPMEM	Group membership	1 = Yes; 0 = No	+
FRMEXPE	Farming experience	Actual number in years	+

ZAR, South African rand; km, kilometre.

TABLE 2: Socio-economic characteristics of youth.

Variables	Mean	SD	Frequency	%
Gender (male)	-	-	122	58
Marital status (single)	-	-	179	85
Availability of markets (yes)	-	-	63	30
Availability of credit (yes)	-	-	40	19
Availability of extension services (yes)	-	-	88	42
Access to land (yes through inheritance and renting)	-	-	69	33
Youth club or group (1 = yes)	-	-	95	45
Digital group(s) (1 = yes)	-	-	80	38
Age	27.13	9.34	-	-
Education level (secondary)	5.10	1.43	-	-
Household size	4.13	3.18	-	-
Total household income (ZAR)	3 241.56	2 654.00	-	-
Farm size	1.89	1.48	-	-

SD, standard deviation; ZAR, South African rand.

enterprise. These results aligned with the findings of Giwu (2024) and Cheteni (2016) who revealed that educated youth were more likely to view agriculture as a viable career option. The family size was utilised as a proxy for domestic labour. The average household comprised four individuals, who significantly contributed to family labour, thereby reducing the need for hired labour for agricultural operations. These results were in line with Mdoda, Christian and Agbugba's (2023) study that the majority of the households in the Eastern Cape province have four people per household. The youth involved in agricultural enterprises were single, which was beneficial in terms of allowing youth to embrace risk preferences, facilitating income generation and engaging in risk-taking behaviours in farming.

The youth had access to agricultural extension and advisory services, but it was not as anticipated as they had one visit in a month by the agricultural agents who only provided them with production information. Having access to agricultural extension services means that youth were able to receive new agricultural information and assistance from extension personnel although it was not enough given that they visit once a month yet farmers have various challenges. These visits provided youth with trainings aimed at enhancing their enterprise with new agricultural techniques disseminated by extension agents. This negatively impacted storage and marketing as youth were not exposed to such agricultural techniques and agricultural information, which are crucial in providing market information and storage to keep the product fresh. Youth have access to land through rentals and inheritance from their families, which played a crucial role in involving in agricultural enterprises. Youth had an average farm size of 2 ha that they strictly used for farming. This is because of the fact that land is a scarce resource for youth and they can get it only through inheritance or renting. This is not surprising as in Africa, young people are not given land as per the African customs. Youth were members of youth clubs and social media groups, which were instrumental in disseminating information about available training opportunities and how to access markets through online networks. The youth had access to markets, but it was minimal as they only got such information from the clubs and groups, they joined but mostly its informal

markets. The youth had no access to credit. Only 19% of youth have access to credit, and this is not surprising as smallholder farmers in South Africa also struggle with this (Apeh et al. 2023; Mulema et al. 2021; Mdoda et al. 2019; White 2020). Youth engaged in agricultural enterprise had a monthly income of ZAR3241.56 per month, which is derived from agricultural enterprise that was used to take care of the family and farm operations.

Agricultural Enterprise interest by youth

Agriculture encompasses a diverse array of enterprises that are determined by the individual objectives and goals of the farmers. Table 3 shows the agricultural enterprises in which youth have expressed willingness and interest to participate. The most practised agricultural enterprise by youth is poultry keeping. This is common because it requires less training and infrastructures as compared to other agricultural enterprises, and it has a rapid growth circle, requiring only 4 weeks to reach maturity for sales. Youth believe in a fast-selling agricultural enterprise rather than an enterprise that requires time. The second most practised is crop production with 72%. This is common as they get land from families they do not use and practise those crops that do not require more than 2 months to grow and crop production requires less as well as easy to sell to generate income. Tsitsi (2019) noted that youth in agriculture are occupied in the first-stage production of crops for consumption. Also, young people were willing to engage in livestock even though it required a lot of resources. Lastly, small stock production is least as it is more expensive to practice as it requires finances and land at your disposal for grazing and a herder to look after them. These outcomes aligned with the observations of Thibane et al. (2023) that livestock farming is least practised by youth given its demand and finances.

Reasons for willing to participate in agricultural enterprise

Youth participate in agricultural enterprises for several reasons. Table 4 outlines why youth are inclined to participate in farming practices. The study identifies the factors driving their willingness to engage in agricultural activities. South Africa is one of the African nations with a high rate of food insufficiency at the household level and a high unemployment rate. Youth involvement in agriculture is one of the strategies for mitigating food insecurity through enhancing food productivity, which will enhance food availability and generate income. The study outcomes exhibit that most youth commit to agricultural enterprises as they believe they will generate income from practising agricultural enterprises by selling their agricultural produce. With scarce job opportunities in rural areas, agriculture can be a valuable tool to provide income (Zamxaka 2015). Youth engage in agricultural activities as they want to produce their food, which will reduce food consumption expenditure as food prices are exceedingly high, and some people cannot afford them, which will result in starvation. Lastly, they participate in agricultural enterprises to reduce poverty and hunger,

TABLE 3: Agricultural enterprises youth willing to engage in.

Agricultural enterprise	Mean
Poultry keeping (broilers and layers)	0.85
Animal production (such as pig and sheep)	0.60
Crop production (maize, cabbage, potatoes and spinach)	0.72

TABLE 4: Reason for youth willing to engage in agriculture.

Reasons	Mean
Generate income	0.85
Reduce poverty and hunger	0.63
Reduce food consumption expenditure	0.77

which are objectives 1 and 2 of the sustainable development goals (SDGs). This is crucial as poverty and hunger are remarkably high in rural areas.

Determinants of factors influencing willingness and interest of youth in agriculture

Factors influencing the willingness and interest of young people's engagement in agricultural enterprises were predicted by utilising the univariate Probit regression model. Table 5 presents the predictions of the determinants of factors influencing the willingness and interest of young people in farming in the study area. Subsequently, dependent variables were used as the parameters of willingness and interest of young people's involvement in farming. A parameter with a negative sign in the independent factors is regarded as either diminishing participation or decreasing participation of youth. The outcomes of the coefficients, standard errors, significance level, marginal effects, log-likelihood ratio (LR, Chi-square) and pseudo- R^2 from the evidence-based estimation of the univariate Probit model are presented in Table 5. The outcomes of univariate Probit regression reveal that the log-likelihood ratio (LR, Chi-square) is significant at 1%, meaning that independent variables included in the univariate Probit model jointly explain the possibility of young people in farming activities. The pseudo- R^2 was 54%, meaning the model fits the data. A comprehensive analysis of the results is provided below.

The results reveal that the gender of the respondents had a negative coefficient and was statistically significant at a 5% level. There is a negative interaction between gender and young people's engagement in agriculture. This implies that a 1% increase in the proportion of male youth, who are the predominant gender, correlates with a reduction in youth's engagement in farming activities. This trend is attributed to the preference among many males, as they mature for investing in non-agricultural pursuits that promise quicker returns and require less physical effort. These results were in line with Jayasinghe and Niranjala (2021) who found equivalent results. The marginal effect of youth participating in agricultural enterprises and all other things is kept constant; for a 1% increase in gender, the youth participation in agricultural enterprises will increase by 33%.

Education level had a positive coefficient and was statistically significant at a 5% level. This suggests that education and

youth participation have a positive relationship. This implies that one more year spent in schooling will generate a rise in youth engagement in farming activities because of the vast knowledge and skills gained. This phenomenon arises because extended years of schooling enhance an individual's knowledge and skills, which are beneficial for effectively managing and operating a farm. Also, the youth is attaining information on new agricultural techniques and market information that assist the agricultural enterprise as well as on how to manage the farm as he or she spends more years in school studying. Youth who are educated tend to look for work outside the agricultural industry as they consider farming as labour intensive and is practised by uneducated people. This implies that the results are not the same of Mehrotra and Parida (2019) who noted that youth with education tend to look for employment in other sectors. Nonetheless, it is crucial to broaden the perspectives of educated youth, enabling them to apply their enhanced knowledge and skills effectively in agricultural activities and sustain their engagement in the sector. These findings concur with Ng'atigwa et al. (2020), Etim and Udoh (2020) and Yami et al. (2019) that education is very crucial for youth engagement in agricultural activities as it improves their management skills and facilitates better access to market information. However, these results disagree with Tarekegn et al.'s (2022) findings that educational level negatively affects youth engagement in agricultural activities. The marginal effect of youth participating in agricultural enterprises and all other things is kept constant; for an added year spent in school (education level), the youth engagement in agricultural enterprises will increase by 53%.

Availability to agricultural extension had a positive coefficient and was statistically significant at a 1% level. The positive coefficient of availability to agricultural extension shows that extension contact motivates the engagement of young people in farming activities. This is the case as agricultural extension services disseminate information like new agricultural techniques and train youth in agricultural enterprises. These outcomes aligned with the conclusions of Madan and Maredia (2021) and Mujuru et al. (2022). The marginal effect of youth participating in agricultural enterprises and all other things is kept constant. For a 1% increase in availability to agricultural extension, the youth engagement in farming will increase by 26%. Membership in a social group had a positive coefficient and was statistically significant at a 5% level. This suggests that the majority of the young people who are participants are likely to engage in farming. The findings are supported by Greenhow and Lewin (2019), who noted that membership groups can help youth learn and adopt modern technologies. The marginal effect of youth participating in agricultural enterprises and all other things is kept constant; for a 1% increase in membership of the social groups, the youth participation in agricultural enterprises will increase by 27%.

Farm size had a positive coefficient and was statistically significant at a 5% level. This suggests that an expansion

TABLE 5: The factors influencing the willingness and interest of youth.

Variables	Coefficient	SE	$P > z$	Marginal effects
Gender	-0.63	0.29	0.03**	0.33
Education level	0.38	0.70	0.01**	0.53
Access to agricultural extension	1.49	0.49	0.01***	0.26
Farm size	0.14	0.01	0.02**	0.05
Membership in social groups	0.29	0.02	0.01**	0.27
Farming skill	1.05	0.49	0.01***	0.44
Access to credit	-0.72	0.27	0.02**	-0.25
Water availability	2.57	0.35	0.01***	0.44
Constant	-4.10	0.92	0.00***	0.13

Note: Observation = 210; LR χ^2 ($p > \chi^2$) = 35.61 (0.00); Pseudo- R^2 = 0.54; Log-likelihood = -321.787.
SE, standard error.

** ,significance level at 5%; ***, significance level at 1%.

of 1 ha in farm size will generate an expansion in youth engagement in farming activities because having land at your disposal permits one to practise any agricultural enterprise of his or her choice with no limitation. These results aligned with Jayasinghe and Niranjala (2021) and Tarekegn et al. (2022). The marginal effect of youth participating in agricultural enterprises and all other things is kept constant; for an added hectare increase in farm size, the youth participation in agricultural enterprises will increase by 54%. Water availability had a positive coefficient and was statistically significant at a 1% level. This implies that a 1% water availability will generate youth engagement in agricultural activities. This is because water is the most crucial resource in farming and is a need because without it, there is no farming. The day-to-day running, like irrigation and dams, is crucial for agricultural enterprises. How close are they to the enterprise to limit cost? These results agree with Jayasinghe and Niranjala (2021) and Farayola et al. (2020) that water available is the most significant resource for agricultural enterprises. The marginal effect of youth participating in agricultural enterprises and all other things is kept constant; for a 1% increase in water availability, the youth participation in agricultural enterprises will increase by 44%.

Farming skills had a positive coefficient and were statistically significant at a 1% level. This variable is particularly significant and shows a positive bond between farming skills and youth engagement in farming. This indicates that a unit expansion of 1% in farming skills will cause an improvement in youth engagement in farming activities. This is true because for youth to be fully engaged in farming, they need to possess a certain skill that will enable them to be competitive and knowledgeable about the agricultural enterprise of their choice. The marginal effect of youth participating in agricultural enterprises and all other things is kept constant; for a 1% increase in farming skills, the youth participation in agricultural enterprises will increase by 44%.

Access to credit had a negative coefficient and was statistically significant at a 5% level. This implies that a unit expansion by 1% in access to credit will diminish young people's engagement in farming activities. This is the case as many young people will see this as an opportunity to invest in

non-farm activities that generate income quicker than farming. Additionally, the access to credit will allow the youth to purchase what they need in the household rather than purchasing inputs. Credit availability can assist young people in obtaining enhanced diversity and access to farming technology advancements (farming implements, packing facilities, vehicles supplied with cold storage, shade utilisation, plastic containers and production facilities) that are important in agricultural enterprises. These results aligned with Ng'atigwa et al. (2020) who stated that credit availability is pivotal in farm operations and transporting goods to market centres. The marginal effect of youth participating in agricultural enterprises, along with all other things, is kept constant; for a 1% increase in access to credit, the youth participation in agricultural enterprises will decrease by 25%.

Challenges faced by youth participating in agricultural activities

As much as youth were participating in agricultural activities, they faced challenges. Table 6 shows challenges faced by youth willing and interested in participating in agriculture enterprises. The main challenge encountered by youth was finance. This is the main problem as South Africa is a country that lacks financial institutions that support youth and smallholder farmers (Thamaga-Chitja & Morojele 2014). This challenge was felt as most of the youth quit as they were unable to purchase inputs or transport their produce to markets as they lacked the finance needed. These outcomes aligned with the findings of Thibane et al. (2023); Njeru (2017) and Brenya et al. (2023) that lack of financial support hinders farm operations. The second challenge was limited access to agricultural inputs. This negatively impacted youth interest as agricultural resources are required to establish an agricultural enterprise, so the limit negatively affected youth as they lack resources. Another challenge was the lack of knowledge, information and advisory services among youth involved in agricultural enterprises. This has resulted in most young farmers being unable to implement and adopt new techniques. Lastly, insufficient land is a problem for youth in the study. About 33% have landed through renting from families who do not utilise it and

TABLE 6: Challenges faced by youth who are willing to participate in agriculture.

Challenges	Mean
Limited access to agricultural input (such as seeds, planting material, tools and capital)	0.78
Lack of finance	0.91
Lack of knowledge, information and advisory devices	0.66
Insufficient land	0.60

other inheritance. Land is scarce for young people, and they only get access through renting it, which is costly. Most of the youth do not own the land. These results were in line with Chisasa and Makina (2017), Mdiya and Mdoda (2021) and Ngcobo and Kwesa (2017).

Implication for food sufficiency and agribusiness

The implications for food sufficiency and agribusiness arising from this study are multifaceted and hold significance for both the local community in Umzimvubu Local Municipality and the broader agricultural sector.

Food sufficiency enhancement

The positive correlation between youth engagement in agriculture and critical factors such as educational level, farming skills and social group membership highlights a promising pathway to enhance food security. Focused interventions in these domains by policymakers, agricultural agencies and local communities can cultivate a resilient and skilled agricultural workforce. Investing in educational empowerment through specialised training programmes and workshops equips youth with modern agricultural practices, fostering efficiency and adaptability. Concurrently, fostering farming skills development through first-hand experiences and mentorship enhances proficiency, leading to improved productivity and the adoption of sustainable farming techniques. Encouraging social group membership creates collaborative platforms for knowledge exchange and mutual support, enhancing the overall resilience of the agricultural community. Addressing barriers such as limited land access and financial support is crucial, with initiatives like community-based land-sharing programmes and financial assistance empowering youth to establish and expand agricultural enterprises. Strategically addressing these factors creates a conducive environment for youth to actively contribute to local food production, promoting food security at the community level and cultivating a sustainable and thriving agricultural sector with broader economic implications.

Diversification and agribusiness growth

Recognising household size as a significant factor influencing youth participation in agriculture reveals strategic opportunities for collaborative efforts in farming ventures. This insight is pivotal for maximising the diverse contributions of youth demographics to agriculture, particularly the engagement of single youths. Their increased involvement and demonstrated interest in agriculture offer a valuable resource for diversifying farming practices. Diversification, including various crops, livestock or non-traditional products, gains momentum as single youths,

unburdened by familial responsibilities, showcase higher flexibility and a willingness to explore unconventional agricultural paths. This interest can lead to adopting novel and sustainable farming practices, laying the groundwork for innovative agribusiness ventures. With their inherent risk-taking capabilities, single youths may experiment with alternative crops, organic farming and value-added products, contributing to the overall enrichment of agricultural practices. Their genuine passion for agriculture drives sustained agribusiness growth, with potential endeavours including small-scale agricultural businesses, participation in farmer cooperatives and the creation of niche markets for unique agricultural products. Understanding the influence of household size on youth participation not only informs collaboration strategies but also unveils a promising avenue for diversification and innovation within the agricultural sector, fostering adaptability and resilience.

Economic contribution and gross domestic product growth

The research emphasises the critical responsibility of youth engagement in agriculture, highlighting its potential to significantly enhance economic contributions to the national GDP. As youths actively participate in agricultural enterprises, their positive influence extends beyond local communities, becoming a driving force for overall economic growth. Positive associations between youth engagement and key demographic factors, such as age, education, farming skills, social group membership and household income, signal an opportunity to harness the demographic dividend for broader economic benefits. Facilitating access to financial resources emerges as a critical strategy, enabling young farmers to secure loans for investments in equipment, technology and sustainable practices; fostering agribusiness growth and increasing sector efficiency. The study's emphasis on sustainable agribusiness growth reflects a long-term perspective, advocating for environmentally friendly practices and innovative technologies to ensure enduring contributions to the GDP. The findings suggest a transformative potential wherein active youth involvement catalyses economic development. The positive correlations with demographic factors provide a roadmap for targeted interventions, with financial access standing out as a vital enabler to unlock the full economic potential of youth-led agribusinesses. Nurturing these initiatives can harness the youth's vibrancy, innovation and energy, propelling sustainable economic growth and cultivating a dynamic and resilient agricultural sector that significantly contributes to national prosperity.

Policy development and holistic approaches

Advocating for a tailored policy framework that caters to the unique characteristics of the youth and adapts to environmental challenges emphasises the necessity of a holistic technique for promoting sustainable youth engagement in agriculture. This imperative recognises that policies must go beyond conventional methods, considering the distinct needs, aspirations and problems young individuals in the farming industry encounter. Collaborative efforts involving government,

the Department of Agriculture and non-governmental organisations are essential for this comprehensive policy development. The energy among these stakeholders ensures a diverse and inclusive approach. These policies should not only address financial barriers but also encompass educational empowerment, skill development and the creation of a supportive social environment. By fostering an integrated and collaborative policy landscape, countries can make conducive surroundings for youth to prosper in agriculture, contributing to the resilience and innovation of the agricultural sector while addressing broader socio-economic challenges.

Conclusion and recommendations

The study observed aspects that impact youths' willingness to participate in agriculture in Umzimvubu Local Municipality. A stratified random sampling approach was used to gather data from youth. Descriptive statistics and a univariate Probit regression model were applied for analysis. The study provides valuable insights into the socio-economic characteristics, interests, motivations, challenges and determinants influencing youth engagement in agriculture within Umzimvubu Local Municipality. Key findings reveal that male youths dominate agricultural activities because of perceptions of physical demands, while educational attainment and access to social groups significantly influence their participation. Financial constraints, limited access to agricultural inputs and insufficient land pose significant challenges to youth involvement in farming. Empirical results reveal that education level, access to agricultural extension, farm size, membership in social groups, farming skills and water availability positively influenced youth participation in agricultural enterprises. In contrast, gender and access to credit negatively influenced youth participation in agricultural enterprises. Based on the study findings, it is recommended that government and policymakers invest in the targeted educational programmes and promote agricultural curriculum in schools. Improving access to agricultural extension services should include comprehensive storage, marketing and sustainable practices training. Facilitating access to finance through tailored mechanisms like low-interest loans and grants is crucial, alongside promoting participation in youth clubs and digital groups for knowledge sharing and networking. Addressing land access issues through land-sharing programmes and supporting diversification in agricultural enterprises will encourage innovation and sustainability. Additionally, advocating for flexible and inclusive policies prioritising youth in agriculture is essential for long-term sectoral growth and development.

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The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

O.G., L.M., S.S.N. and O.L. contributed equally to the design and implementation of the research, to the analysis of the results and to the writing of the article.

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Data availability

The data that support the findings of this study is available from the corresponding author, L.M. upon reasonable request.

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