REVIEWED JOURNAL INTERNATIONAL of BUSINESS MANAGEMENT
ISSN 2663-127X

Vol. 7, Iss. 1 (2026), pp 588 – 609, November 5, 2026. www.reviewedjournals.com, ©Reviewed Journals

YOUTH PARTICIPATION IN AGRICULTURAL ENTREPRENEURSHIP AND BUSINESS DEVELOPMENT IN THE ALI-SABIEH REGION OF DJIBOUTI, 2020–2025

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Accepted: October 18, 2026

DOI: https://doi.org/10.61426/business.v7i1.601

ABSTRACT

Agricultural entrepreneurship is widely regarded as a pathway to employment, income and food security for young people in developing economies. Djibouti presents a demanding test of this view: agriculture contributes under 3% of GDP, more than 80% of food is imported, and youth unemployment is among the highest in the world. This study examines how youth participation in agricultural production, agribusiness, technology adoption and training relates to agricultural entrepreneurship and business development in the Ali-Sabieh Region between 2020 and 2025. A descriptive, mixed-methods design was used. Structured questionnaires were distributed to a census of 400 respondents drawn from eight categories of agribusiness actors, and 330 were returned (82.5%). Descriptive statistics, Pearson correlations and multiple linear regression were run in SPSS, supported by interviews and focus group discussions. Respondents reported high levels of participation (composite mean = 4.40), strong agreement that enabling factors such as finance, mentorship and training matter (composite mean = 4.44), and strong perceived socioeconomic benefits (composite mean = 4.54). The regression model explained 73.0% of the variance in agricultural entrepreneurship and business development ($R^2 = 0.730$, $F(4, 325) = 219.38$, $p < 0.001$). Participation in agribusiness and entrepreneurship was the strongest predictor ($\beta = 0.386$), followed by involvement in agricultural production ($\beta = 0.255$), participation in training and extension ($\beta = 0.230$) and adoption of modern technologies ($\beta = 0.161$). The findings point to integrated support combining finance, skills and technology as the most promising lever for youth agribusiness in arid settings. Because the data are cross-sectional and self-reported, and because most respondents were older than the 15–35 youth bracket used by the study, the results should be read as associations and interpreted with caution.

Keywords: *Youth Participation; Agricultural Entrepreneurship; Agribusiness; Youth Employment; Ali-Sabieh; Djibouti*

CITATION: Djama, I. A., & Ndokoye, P. (2026). Youth participation in agricultural entrepreneurship and business development in the Ali-Sabieh region of Djibouti, 2020–2025. *Reviewed Journal International of Business Management*, 7 (1), 588 – 609.

INTRODUCTION

Youth engagement in agriculture has become a central concern of development policy. The global farming workforce is ageing, the world population is projected to approach 10 billion by 2050, and young people in many regions continue to see farming as arduous and unprofitable (FAO, 2021; World Bank, 2022). Policy attention has therefore shifted from farming as subsistence to agriculture as a knowledge- and innovation-driven business sector capable of absorbing young labour (FAO, 2024; IFAD, 2023).

The constraints young people face differ sharply across regions. In Sub-Saharan Africa a youthful population and high unemployment make agriculture a natural candidate for labour absorption, but limited land, credit and technology continue to restrict youth agri-entrepreneurship (AGRA, 2021). Kenya has shown how mobile technology and digital finance can widen market access for young agripreneurs, although repayment burdens and arid-zone water and market constraints persist. Rwanda has linked youth employment to its Strategic Plan for Agriculture Transformation, yet land fragmentation and uneven access to technology limit results.

Djibouti is a distinctive case. Agriculture accounts for under 3% of GDP because of aridity and scarce arable land, and more than 80% of food is imported (FAO, 2023; World Bank, 2024). Youth unemployment was estimated at 76.3% in 2024, and youth make up over 60% of the population (Statista, 2025; AfDB, 2024). Government and partners have responded with initiatives such as the PEJACC project, an emphasis on irrigated agriculture, and agribusiness incubation (AfDB, 2022; Ministère de la Jeunesse de Djibouti, 2023). Ali-Sabieh, in the south of the country on the Ethiopian border, is a semi-arid region of agro-pastoral livelihoods and cross-border trade where such interventions are concentrated.

Statement of the Problem

Youth unemployment and limited participation in agricultural entrepreneurship remain persistent problems in Djibouti, and they are most acute in underserved regions such as Ali-Sabieh. With youth unemployment estimated at 76.3% in 2024 and young people making up over 60% of the population, the mismatch between the skills young people acquire and what the labour market demands, together with an underdeveloped productive base, deepens economic exclusion and narrows the routes to a sustainable livelihood (AfDB, 2024; Statista, 2025). In Ali-Sabieh these difficulties are compounded by limited access to land, finance, modern technology and value-chain markets, which hold back youth engagement in agribusiness and the sector's capacity to create jobs and diversify the local economy (FAO, 2024; ILO, 2023; World Bank, 2024). Training, finance and technology programmes have been introduced, but it remains unclear which forms of youth participation, and which supporting conditions, are actually associated with stronger business development in this semi-arid setting. Without such evidence, interventions risk being designed on assumptions drawn from better-watered economies.

The empirical record for this setting is thin. African studies have examined agribusiness empowerment, digital innovation and ICT adoption among young people (Gyamfi et al., 2024; Ouma et al., 2023), and Rwandan evidence documents liquidity and skills constraints (McIntosh & Zeitlin, 2022), but these findings do not transfer readily to Djibouti's arid ecology and institutional environment. Most work also uses national or cross-country scales and overlooks the subnational governance, resource and network conditions that shape local outcomes (Hussein, 2025).

Research Objectives and Questions

This article addresses that gap. It examines the role of youth participation in agricultural entrepreneurship and business in Ali-Sabieh between 2020 and 2025, guided by three objectives: (i) to identify the level and form of youth participation in entrepreneurship and business; (ii) to assess the factors that facilitate participation and business development; and (iii) to determine the relationship between youth participation and business growth and socioeconomic development. The corresponding research questions ask what the level and forms of

participation are, which factors facilitate or hinder it, and how participation relates to business growth and wider development.

Significance of the Study

The study contributes to knowledge and practice in four ways. First, it offers subnational evidence from a semi-arid region of Djibouti where little empirical work exists, and so adds to the literature on youth agripreneurship in arid and semi-arid settings (Boubakar & Mohamed, 2023; Hussein, 2025). Second, it gives policymakers evidence on how existing youth empowerment and agribusiness programmes are perceived by the people they target, and where gaps in access to finance, land, training and markets remain. Third, it helps development partners, cooperatives and extension providers to see which supports young people value most and how those supports might be combined. Finally, it informs young people themselves by documenting the forms of participation open to them, the conditions that help, and the barriers they face.

Scope of the Study

Content. The study examines youth participation in agricultural production, agribusiness and entrepreneurship, technology adoption, and training and extension, together with the factors that facilitate participation and the perceived socioeconomic outcomes. It also profiles respondents by demographic characteristics, type of agricultural activity, and access to training and finance.

Time. The study covers 2020 to 2025, a period in which training programmes, agribusiness initiatives and government and partner support aimed at youth involvement in agriculture were active in the region.

Geography and respondents. The study was conducted in the Ali-Sabieh Region of Djibouti, where agriculture and livestock sustain rural livelihoods and where there is potential for youth agribusiness. Respondents were drawn from eight categories of agribusiness actors identified by the Regional Agricultural Directorate, ranging from youth farmers and agripreneurs to extension providers and local leaders.

Theoretical Background and Conceptual Framework

The study draws on five complementary theories.

Entrepreneurial ecosystem theory holds that entrepreneurial success depends on a network of interdependent actors and conditions, including finance, markets, infrastructure, technology and supportive policy (Isenberg, 2021). Applied to young farmers, it implies that success rests not only on individual motivation but on the environment that supplies resources, training and networks.

Human capital theory treats education and training as investments that raise productivity (Becker, 1964). In agriculture it predicts that young people with technical and business skills are more likely to adopt improved practices, add value and manage profitable enterprises. This logic underlies the study's focus on training and extension.

Resource-based theory argues that performance derives from the strategic use of tangible and intangible resources (Barney, 1991). For youth enterprises, land, capital, inputs and technology, together with knowledge and relationships, shape the growth and sustainability of the business.

Social capital theory emphasises that networks and cooperative linkages give access to information, finance and mentorship (Putnam, 2000). Cooperatives and youth associations are the main institutional form of such capital in Ali-Sabieh.

Diffusion of innovations theory explains how new practices spread through social systems, shaped by perceived advantage, compatibility and communication channels (Rogers, 2003). It frames the adoption of modern agricultural and digital technologies.

The conceptual framework follows from these theories. Four independent variables, namely involvement in agricultural production, participation in agribusiness and entrepreneurship, adoption of modern agricultural technologies, and participation in training and extension programmes, are expected to be positively associated with the dependent variable, agricultural entrepreneurship and business development. Access to finance, mentorship, supportive policy, cooperatives and market linkages are treated as enabling conditions.

Figure 1 sets out the framework, which reads from left to right. Youth participation, captured by the four independent variables, is expected to be positively associated with agricultural entrepreneurship and business development, which is shown through business start-up, growth and expansion, profitability, innovation and value addition, and sustainability. Business development is in turn expected to be linked to wider socioeconomic outcomes: household income, living standards, food security, job creation and community development. Enabling conditions sit beneath this pathway. These are access to finance, mentorship, supportive policy and programmes, cooperatives and youth networks, market linkages, and quality inputs, technology and land. They are expected to shape whether participation translates into viable enterprises.

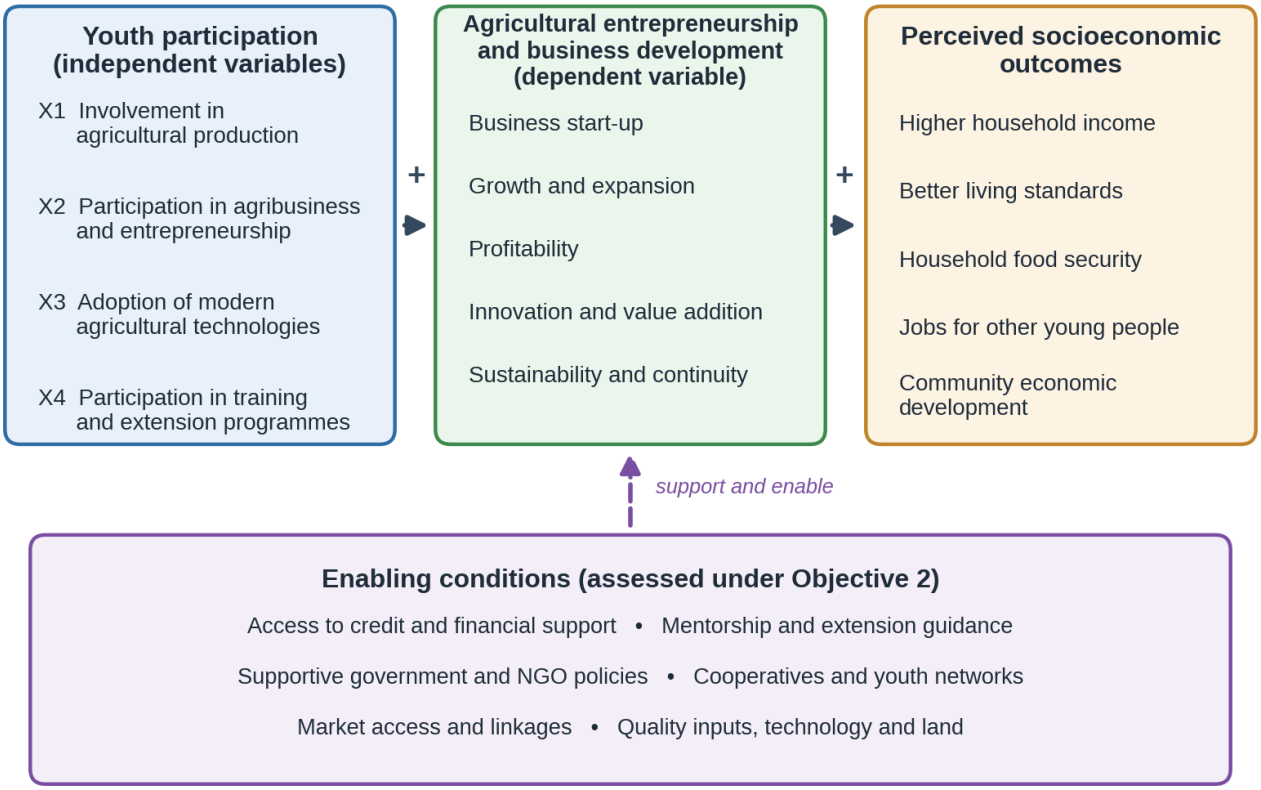


Figure 1. Conceptual framework of youth participation and agricultural entrepreneurship in Ali-Sabieh

Note. Developed by the author from the theories reviewed in this section.

Each element of the framework draws on one or more of these theories. Involvement in production and participation in agribusiness (X1 and X2) reflect the use of land, capital, inputs and experience as business resources (resource-based theory). Participation in training and extension (X4) represents investment in skills (human capital theory), and adoption of modern technologies (X3) captures the uptake of new practices (diffusion of innovations). The enabling conditions combine the supports described by entrepreneurial ecosystem theory with the networks and cooperative linkages emphasised by social capital theory.

Table 1 summarises how each theory is linked to the constructs and expected relationships in the framework.

Table 1. Theories, constructs and expected relationships

Theory	Core proposition	Construct in this study	Expected relationship
Entrepreneurial ecosystem (Isenberg, 2021)	Success depends on interdependent finance, markets, infrastructure, technology and policy	Enabling conditions: finance, mentorship, policy, market linkages	Enabling conditions help participation translate into viable enterprises
Human capital (Becker, 1964)	Education and training raise productivity	X4: participation in training and extension	Positive association with business development
Resource-based (Barney, 1991)	Performance derives from strategic use of tangible and intangible resources	X1: involvement in production; X2: participation in agribusiness	Positive association with business development
Social capital (Putnam, 2000)	Networks give access to information, finance and mentorship	Cooperatives and youth networks (enabling condition)	Facilitate participation and growth
Diffusion of innovations (Rogers, 2003)	Adoption is shaped by perceived advantage, compatibility and communication	X3: adoption of modern agricultural technologies	Positive association; strength depends on stage of adoption

Note. Developed by the author from the theories reviewed in this section.

The framework is associational. It specifies expected relationships rather than causal pathways. Only the four participation variables enter the regression model (Section 4.6), while the enabling conditions and the socioeconomic outcomes are assessed descriptively under Objectives 2 and 3. The framework guides the selection of variables, the structure of the questionnaire and the analysis that follows.

Key terms are used as follows. *Youth* refers to persons aged 15–35, the bracket used by the African Union and the Government of Djibouti (African Union, 2021; Ministère de la Jeunesse de Djibouti, 2023). *Agricultural entrepreneurship* (agripreneurship) denotes the creation and management of agricultural business ventures that seek income and growth. *Agribusiness* covers activities along the value chain from inputs and production to processing, marketing and distribution. *Extension services* are the advisory and technical support offered to producers.

Digital technology adoption refers to the use of mobile applications, social media, e-marketplaces and other digital tools in farming and business activities. *Market access* is the ability of producers to connect reliably with buyers, input suppliers and service providers, and includes access to price and market information as well as physical proximity. *Participation* denotes active involvement in agricultural production, agribusiness, training, cooperatives and related activities, and is measured here through respondents' agreement with statements describing such involvement. *Entrepreneurial engagement* denotes the depth and continuity of involvement in agribusiness ventures, indicated by registration, investment and decision-making. The *Ali-Sabieh Region* is the semi-arid administrative region in southern Djibouti, bordering Ethiopia, in which the study was conducted.

LITERATURE REVIEW

Youth in agricultural development

Young people are both a demographic opportunity and a policy challenge for agrifood systems. Where land access, credit and market information are weak, young people tend to enter agriculture later, on a smaller scale, or not at all, and many prefer off-farm opportunities (FAO, 2024). Comprehensive reform that combines

value-chain participation, skills and institutional support is repeatedly argued to work better than land access alone (World Bank, 2024).

Young people are not a uniform group. Beyond age, gender, education, rural–urban location and socioeconomic status shape who can reach land, finance and training (IFAD, 2023; World Bank, 2024). Roughly 44% of working youth worldwide depend on agrifood systems for employment (FAO, 2024), and in Sub-Saharan Africa, where young people make up over 60% of the population, failure to integrate them into productive value chains risks worsening unemployment, rural–urban migration and food insecurity (AfDB, 2024; Gyamfi et al., 2024).

The structural constraints are well documented. Insecure land tenure and high entry costs fall disproportionately on young entrepreneurs, particularly women, and limit their ability to scale up (Banga et al., 2021; Hussein, 2025). Institutional supports such as youth-targeted extension, vocational training and mentorship offset some of these constraints by building human capital. Contemporary framings also treat young people as active agents who use digital tools, market linkages and collaborative networks to drive rural change, not as passive beneficiaries (Ouma et al., 2023). This shifts attention to aligning skills, finance and market access, and to the place-based conditions, such as ecology, governance and culture, that determine whether interventions are inclusive and effective in settings like Ali-Sabieh.

Agricultural entrepreneurship and value-chain engagement

Agricultural entrepreneurship, often called agripreneurship, is the application of innovative, risk-taking and value-creating business practice along agricultural value chains, from primary production to processing, marketing and services (FAO, 2024; Gyamfi et al., 2024). It differs from subsistence farming in its market orientation, use of technology and pursuit of sustainable profit. In arid settings such as Djibouti it often combines climate-smart practices with the development of niche markets (Banga et al., 2021; Hussein, 2025).

Explanations of agripreneurship draw on opportunity-based entrepreneurship, the resource-based view and livelihoods approaches. Together they suggest that success depends on individual traits such as innovation and risk tolerance and also on an enabling ecosystem of finance, mentorship, market information and supportive policy (Arouna et al., 2023). Where young agripreneurs receive integrated support, they are more likely to adopt digital tools, join cooperatives and move into value-added activities that stabilise income and create jobs (IFAD, 2023; Ouma et al., 2023). The literature also separates survivalist activity from growth-oriented ventures and argues that success should be judged on several indicators, including financial performance, social capital, sustainability and community resilience, rather than revenue alone (World Bank, 2024).

Agricultural activities span crop production, livestock management, post-harvest handling and primary value addition. In semi-arid areas such as Ali-Sabieh they are shaped by water scarcity and soil degradation, which favour drought-tolerant cropping, small-scale irrigation and integrated crop–livestock systems (Banga et al., 2021; Hussein, 2025). Value-chain engagement widens this view to include input supply, processing, distribution and marketing, and treats youth participation as involvement in decisions, innovation and value capture rather than labour alone (FAO, 2024). Land tenure security, access to credit, gender norms and digital literacy determine whether young people can move into higher-value activities such as agro-processing and e-commerce (Ouma et al., 2023), and upgrading through certification or branding requires coordinated support from extension services, financial institutions and policy (FAO, 2025).

Training, extension and human capital

Training and extension are consistently linked to better entrepreneurial outcomes because they build technical, financial and managerial competence. Mentorship from experienced entrepreneurs and extension officers adds a practical, trust-based channel for advice that formal courses cannot replace (IFAD, 2023). The evidence from Rwanda, however, shows that skills alone do not suffice when liquidity constraints bind (McIntosh & Zeitlin, 2022), which supports an integrated rather than single-instrument approach.

Training and extension take several forms, including vocational programmes, farmer field schools, mobile advisory platforms and mentorship. They transfer technical knowledge, such as climate-smart agronomy, post-harvest management and business planning, together with soft skills such as financial literacy and negotiation (Abebe & Tadesse, 2022; FAO, 2024). Their effect depends on the relevance, accessibility and cultural fit of the content (IFAD, 2023). Delivery has also changed: mobile advice, e-learning and social media increasingly supplement face-to-face extension (FAO, 2025; Ouma et al., 2023). Technology-mediated extension must nonetheless allow for gaps in digital literacy, connectivity and language, particularly in remote arid areas (Gyamfi et al., 2024; Hussein, 2025), which is why a hybrid model that pairs community facilitators with digital tools is widely advocated.

Human-capital investment has most effect when it is iterative and participatory, with feedback between providers and young beneficiaries and alignment with market demand and ecological conditions (World Bank, 2024). In resource-constrained settings, extension that is coordinated with finance and market initiatives is more likely to help young entrepreneurs apply and scale what they have learned.

Market access and commercialisation

Participation in cooperatives and producer organisations reduces transaction costs, improves bargaining power and gives young producers entry to buyers. In arid regions, long distances and weak infrastructure make these linkages especially important, and cross-border trade offers additional demand that a place such as Ali-Sabieh is well placed to serve.

Market access is best treated as a multidimensional construct. It covers physical proximity, price and market information, and institutional trust, together with contractual arrangements that limit vulnerability to exploitation (FAO, 2024). Without viable commercialisation routes, youth engagement tends to stay at subsistence level, which limits income and reinvestment (Arouna et al., 2023; World Bank, 2024).

Poor transport, high transaction costs and information asymmetries constrain participation in commercial chains (Banga et al., 2021; Gyamfi et al., 2024). Digital platforms reduce search costs and connect remote producers with urban buyers, while cooperatives raise bargaining power and allow bulk marketing (Hussein, 2025; Ouma et al., 2023). Where physical market infrastructure is thin, as in Ali-Sabieh, these alternative channels matter more. Policies that standardise quality, facilitate cross-border trade and protect smallholders from price volatility strengthen the link between market access and outcomes such as income stability and business scaling (IFAD, 2023).

Digital technology and agritech

Mobile finance, market-information services and digital platforms have lowered entry barriers for young agripreneurs in East Africa and are associated with better business performance (Ouma et al., 2023; Gyamfi et al., 2024). Gains depend on connectivity, digital skills and affordability, and are uneven between regions (FAO, 2025).

Digital technology adoption refers to integrating mobile applications, financial technology, remote sensing and data analytics into farming and business processes to improve efficiency and decision-making (FAO, 2025; Ouma et al., 2023). It can reduce information asymmetries and ease the isolation and limited access to financial services that hold back young producers, but adoption is iterative and requires continued learning and adaptation to local ecological and market conditions (Gyamfi et al., 2024).

Adoption is mediated by digital literacy, reliable infrastructure and the affordability of devices. A digital divide can widen inequalities among young people, particularly in remote or arid regions (Hussein, 2025; World Bank, 2024). Without attention to these foundations, technology interventions risk benefiting only a privileged subset of entrepreneurs and so limiting the wider developmental effect of digital tools.

Entrepreneurial engagement and development outcomes

Youth-led agribusiness is credited with a multiplier effect: successful ventures raise the incomes and food security of their owners, create work for peers and retain value in the local economy (ILO, 2023; IFAD, 2023). The same literature cautions that the strength of these effects depends on the quality of institutional support and on gendered and spatial differences in access to resources.

Entrepreneurial engagement is the depth and continuity of involvement in agribusiness ventures, distinguished from occasional labour by registration, investment and strategic decision-making (Hussein, 2025; IFAD, 2023). Committed entrepreneurs are more likely to adopt innovative practices and diversify income, which strengthens resilience to agricultural volatility. The development outcomes are multidimensional and include financial performance, job creation, household food security and wider community benefit (ILO, 2023; IFAD, 2023). Evidence from semi-arid East Africa links access to credit with better business performance among young agripreneurs (Mwangi et al., 2023), and integrated support across resources, training, markets and technology is associated with more sustainable agribusiness outcomes (FAO, 2024; IFAD, 2023).

Research gap

Taken together, existing studies are either national or cross-country in scale, concentrate on better-watered economies, or examine single instruments such as credit or ICT. Few test an integrated set of participation, training and technology variables against business development in a subnational arid setting. This study addresses that gap for Ali-Sabieh.

In sum, the literature supports three propositions that the present study examines in Ali-Sabieh. The first is that active participation along the value chain, training and extension, and technology adoption are each associated with stronger business development. The second is that finance, mentorship, policy support, cooperatives and market linkages enable these effects. The third is that business development is linked to wider socioeconomic gains. Evidence for Djibouti is thin and tends to be national in scale (Boubakar & Mohamed, 2023; Hussein, 2025), so these propositions have not been examined with subnational data from an arid region.

METHODOLOGY

Research design

A descriptive research design with a mixed-methods approach was adopted. Description suits a study that aims to characterise participation patterns and relationships among variables without manipulating them (Creswell & Creswell, 2022; Saunders et al., 2023). Quantitative data came from structured questionnaires, and qualitative data from semi-structured interviews, focus group discussions and document review, which allowed triangulation.

The mixed-methods component was integrated at the interpretation stage, so that interview and focus-group material could explain or qualify the questionnaire results (Bryman, 2022; Tashakkori & Teddlie, 2021). The descriptive design suits the study’s aims of profiling participation and examining associations among perception-based variables, but it does not support causal inference, and the findings are interpreted accordingly (Saunders et al., 2023).

Study area

The study was conducted in the Ali-Sabieh Region in southern Djibouti, one of the country's six administrative regions. The climate is semi-arid with sparse vegetation. The population is predominantly pastoral and agro-pastoral, engaged in small-scale crop production, livestock rearing and emerging agribusiness. Its position on cross-border trade routes and its growing youth population have attracted development programmes aimed at value-chain strengthening, training and youth employment.

Ali-Sabieh lies along cross-border trade routes with Ethiopia, and its growing youth population has attracted government and partner programmes that aim to strengthen value chains, widen access to training and extension, and increase youth participation in agribusiness (AfDB, 2024; FAO, 2024). Livelihoods combine small-scale crop production, livestock rearing and emerging agribusiness; interview participants described goat and camel rearing, vegetable gardening and local trading as typical youth activities.

Population and sampling

The target population comprised 400 individuals identified through the Ali-Sabieh Regional Agricultural Directorate (2026) across eight categories: youth farmers (120), youth agripreneurs (60), youth in value-chain activities (50), youth leaders and cooperative members (40), beneficiaries of agricultural programmes (70), extension and service providers (25), youth in agritech and innovation (20), and local leaders and policy influencers (15). A census approach was applied so that all categories were represented (Taherdoost, 2022).

Table 2 summarises the target population. A census was feasible because the population was small and registered with the Regional Agricultural Directorate. It removes sampling error and ensures that small but strategically important groups, such as agritech innovators and local leaders, are represented (Taherdoost, 2022). The cost is that the respondents are a roster of agribusiness actors rather than a random sample of all young people in the region, which limits generalisation beyond this population.

Table 2. Target population by category of respondent

Category	Number (N)	Share (%)
Youth farmers (primary producers)	120	30.0
Youth agripreneurs (business owners)	60	15.0
Youth in value-chain activities	50	12.5
Youth leaders and cooperative members	40	10.0
Beneficiaries of agricultural programmes	70	17.5
Extension and service providers	25	6.3
Youth in agritech and innovation	20	5.0
Local leaders and policy influencers	15	3.8
Total	**400**	**100.0**

Note. Adapted from the Ali-Sabieh Regional Agricultural Directorate (2026). Percentages are rounded and may not sum exactly to 100.

Sources and methods of data collection

Primary data came from three sources: a structured questionnaire administered to the eight respondent categories, semi-structured interviews with key informants (cooperative leaders, extension officers, local government officials and project staff), and focus group discussions with youth participants that explored shared challenges, opportunities and innovative practices. Primary data give first-hand, current and context-specific information about participation and about the barriers and enablers young people meet (Kothari, 2022).

Secondary data came from published and unpublished documents. These included national strategies such as the *Stratégie nationale pour l'emploi des jeunes 2023–2027* (Ministère de la Jeunesse de Djibouti, 2023), regional agricultural plans, cooperative registry records, and reports from FAO, the World Bank and IFAD, together with peer-reviewed articles and programme evaluations published between 2021 and 2025. The documents were appraised for credibility, relevance and timeliness, examined through structured content analysis for thematic patterns, policy gaps and implementation challenges, and used to contextualise and cross-check the primary findings (Bowen, 2023).

Combining questionnaires, interviews, focus groups and documents allowed triangulation. Each source could confirm, qualify or extend the others, which strengthens the credibility of the conclusions (Creswell & Creswell, 2022).

Instruments, pilot, validity and reliability

The main instrument was a questionnaire with closed items on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree), organised around the four independent variables and the dependent variable. Interview guides were used with cooperative leaders, extension officers and local officials, and focus group discussions with youth participants. A documentary review covered national strategies, regional plans and reports of international agencies.

The instruments were pre-tested on 40 respondents (10% of the population) in Dikhil District, which resembles Ali-Sabieh demographically and agriculturally. Content validity was established through expert review by lecturers and professionals in agricultural development and research methods. Reliability was assessed with Cronbach's alpha, and all constructs exceeded the 0.70 threshold (Hair et al., 2022; Taber, 2022): involvement in agricultural production (0.812), participation in agribusiness and entrepreneurship (0.749), adoption of modern agricultural technologies (0.891), participation in training and extension programmes (0.857), and agricultural entrepreneurship and business development (0.789).

Validity was assessed in three ways. Content validity rested on review by lecturers and professionals in agricultural development and research methods. Construct validity was supported by aligning items with the theoretical framework and the study objectives. Factor-analytic checks on the pilot data then gave a Kaiser–Meyer–Olkin measure of sampling adequacy of 0.832 and a significant Bartlett's test of sphericity (χ^2 = 990.627, df = 10, $p < 0.001$), which indicate that the data were suitable for factor analysis (Table 3). KMO values above 0.80 are generally regarded as meritorious (Field, 2021; Hair et al., 2022; Pallant, 2022).

The reliability coefficients in Table 3 range from 0.749 to 0.891. Three constructs exceeded 0.80, and the remaining two (0.749 and 0.789) were acceptable against the 0.70 threshold (Hair et al., 2022; Taber, 2022). Participation in agribusiness and entrepreneurship had the lowest coefficient, so results for that construct deserve slightly more caution.

Table 3. Reliability and validity of the research instruments (pilot, n = 40)

Construct or test	Statistic	Interpretation
Involvement in agricultural production	α = 0.812	Good
Participation in agribusiness and entrepreneurship	α = 0.749	Acceptable
Adoption of modern agricultural technologies	α = 0.891	Good
Participation in training and extension programmes	α = 0.857	Good
Agricultural entrepreneurship and business development	α = 0.789	Acceptable
Kaiser–Meyer–Olkin measure of sampling adequacy	0.832	Meritorious
Bartlett's test of sphericity	χ^2 = 990.627, df = 10, p < 0.001	Significant

Note. Pilot data (2026). α = Cronbach's alpha.

Data processing and analysis

Data were coded and analysed in SPSS. Frequencies, percentages, means and standard deviations described the respondents and each objective's indicators. Pearson correlations examined bivariate associations, and a multiple linear regression estimated the combined and individual effects of the four predictors on agricultural entrepreneurship and business development:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$$

where X_1 is involvement in agricultural production, X_2 is participation in agribusiness and entrepreneurship, X_3 is adoption of modern agricultural technologies and X_4 is participation in training and extension programmes. Qualitative material was organised thematically and used to contextualise the statistical results.

Data processing began with checks for completeness and consistency. Responses were then coded, entered into SPSS and cleaned for errors and ambiguous entries (Saunders et al., 2023). Means and standard deviations were computed for each statement and averaged to give a composite mean for each scale. Qualitative material from interviews, focus groups and documents was organised thematically, using procedures that attend to trustworthiness (Nowell et al., 2023), and was integrated with the statistical results.

The analysis was matched to the objectives. Objective 1 was addressed with descriptive statistics. Objective 2 was addressed by descriptive analysis of the rated enabling factors, supported by interview evidence. Objective 3 was addressed with correlation and multiple regression analysis of the four predictors against business development, together with descriptive analysis of perceived socioeconomic outcomes. The Durbin–Watson statistic was used to check for autocorrelation in the residuals, and results were judged significant at $p < 0.05$.

Ethical considerations

Participation was voluntary and anonymous, respondents were informed of the study's purpose, and data were used only for academic purposes. Introduction and data collection letters were obtained from the university and the relevant regional authority.

Informed consent was obtained from every respondent before participation, and respondents were told of their right to withdraw at any time without penalty. No personal identifiers were recorded in the questionnaires or interview guides, data were stored securely, and sensitive questions were phrased neutrally to avoid distress. Approvals were sought from local government and institutional authorities before data collection began (Bryman, 2022; Kothari, 2022).

RESULTS

Response rate and respondent profile

Of the 400 questionnaires distributed, 330 were returned, a response rate of 82.5%, which is adequate for analysis. Males made up 58.8% of respondents (n = 194) and females 41.2% (n = 136). By age, 6.1% were under 25, 24.2% were 25–34, 32.7% were 35–44, 27.3% were 45–54 and 9.7% were 55 or older. By marital status, 37.6% were single, 34.5% married, 11.5% divorced, 11.5% separated and 4.8% widowed.

Educational attainment was mixed: 27.9% had secondary education and 27.9% a diploma, 17.0% primary education, 10.9% a bachelor's degree, 9.1% a postgraduate qualification and 7.3% no formal schooling. Regarding employment, 35.8% were unemployed, 23.6% students, 20.0% government employees, 13.9% employed in other sectors and 6.7% self-employed.

By role, the largest group was beneficiaries of agricultural programmes (28.5%), followed by cooperative members (17.0%), value-chain actors (15.8%), agripreneurs (13.3%), youth farmers (8.5%), local leaders (7.3%), extension providers (6.1%) and agritech innovators (3.6%). Experience was concentrated in the middle range: 34.5% reported 4–6 years, 21.8% reported 7–10 years, 16.4% reported 1–3 years, 13.9% less than one year and 13.3% more than ten. Among those engaged in a specific type of business, 46.1% were in agritech-related activities, 23.6% in trading and marketing, 11.5% in livestock, 10.9% in agro-processing and 7.9% in crop production. Access to agricultural training was reported by 74.5% of respondents and access to financial support by 73.3%.

Table 4 summarises the respondent profile. The sample is mixed. Only about three in ten respondents (30.3%) were under 35, the upper limit of the youth bracket used by the study, so the sample is older than a strict youth definition would imply (see Section 7). Educational attainment was relatively high: 55.8% held secondary education or a diploma and 20.0% held a bachelor's or postgraduate degree, while 7.3% had no formal schooling. More than a third of respondents (35.8%) were unemployed and almost a quarter (23.6%) were students, which may reflect the large share of programme beneficiaries in the sample.

Agritech-related activity was the most common type of business (46.1%), followed by trading and marketing (23.6%), whereas crop production (7.9%) and livestock (11.5%) accounted for the smallest shares. The sample therefore leans towards service, trade and technology activity more than towards primary production, a point taken up in the discussion. About three-quarters of respondents had access to training (74.5%) and to financial support (73.3%), so around a quarter reported no training and a little over a quarter no financial support.

Table 4. Respondent profile (n = 330)

Characteristic / category	n	%	Characteristic / category	n	%
Gender			**Role in agribusiness**		
Male	194	58.8	Beneficiary of agricultural programmes	94	28.5
Female	136	41.2	Cooperative member	56	17.0
Age group			Value-chain actor	52	15.8
Under 25 years	20	6.1	Agripreneur	44	13.3
25–34 years	80	24.2	Youth farmer	28	8.5
35–44 years	108	32.7	Local leader	24	7.3
45–54 years	90	27.3	Extension service provider	20	6.1
55 years or older	32	9.7	Agritech innovator	12	3.6
Marital status			**Years of experience**		
Single	124	37.6	Less than 1 year	46	13.9
Married	114	34.5	1–3 years	54	16.4
Divorced	38	11.5	4–6 years	114	34.5
Separated	38	11.5	7–10 years	72	21.8
Widowed	16	4.8	More than 10 years	44	13.3
Highest education			**Type of business**		
No formal education	24	7.3	Agritech-related	152	46.1
Primary	56	17.0	Trading and marketing	78	23.6
Secondary	92	27.9	Livestock	38	11.5
Diploma	92	27.9	Agro-processing	36	10.9
Bachelor’s degree	36	10.9	Crop production	26	7.9
Postgraduate	30	9.1	**Access to agricultural training**		
Employment status			Yes	246	74.5
Self-employed	22	6.7	No	84	25.5
Employed	46	13.9	**Access to financial support**		
Unemployed	118	35.8	Yes	242	73.3
Student	78	23.6	No	88	26.7
Government employee	66	20.0			

Note. Primary data (2026). Percentages are of the 330 returned questionnaires.

Level and form of youth participation (Objective 1)

Respondents rated eight statements on participation (Table 5). Agreement was high throughout, with item means between 4.25 and 4.57 and a composite mean of 4.40. Cooperative participation (M = 4.57) and attendance at training sessions (M = 4.54) scored highest, followed by adoption of innovative practices (M = 4.47) and active market-seeking (M = 4.42). Engagement in agricultural activities (M = 4.30) and agribusiness (M = 4.25) were the lowest-rated forms, although 84.2% and 84.3% of respondents respectively agreed or strongly agreed. About 80% confirmed that they had formally registered their agricultural business (M = 4.33), and 92.8% agreed that they participate in cooperatives or youth associations.

Table 5. Youth participation in agricultural entrepreneurship and business (n = 330)

Statement	1	2	3	4	5	Agree (%)	Mean	SD
Currently engaged in agricultural activities	2.4	4.2	9.1	29.7	54.5	84.2	4.30	0.969
Participate in agribusiness (selling, processing, value addition)	1.2	4.8	9.7	36.4	47.9	84.3	4.25	0.905
Registered or formalised business	0.6	1.8	17.6	23.6	56.4	80.0	4.33	0.871
Participate in cooperatives or youth associations	0.6	1.2	5.5	26.1	66.7	92.8	4.57	0.708
Attend training sessions and workshops	1.8	0.6	6.1	24.8	66.7	91.5	4.54	0.791
Adopt innovative or modern practices	1.8	3.0	6.1	24.2	64.8	89.0	4.47	0.879
Engage in off-farm entrepreneurial activities	3.6	3.0	7.9	28.5	57.0	85.5	4.32	0.998
Actively seek market opportunities	3.0	2.4	5.5	27.3	61.8	89.1	4.42	0.930
Composite							**4.40**	**0.881**

Note. Primary data (2026), n = 330. Columns 1 to 5 give the percentage choosing strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). Agree (%) combines categories 4 and 5. SD = standard deviation.

The pattern indicates that participation is not confined to primary production. It extends along the value chain into processing, marketing and innovation, and it is organised largely through cooperatives and training programmes.

The distributions in Table 5 are strongly skewed towards agreement. No more than 6.6% of respondents disagreed or strongly disagreed with any statement, and the neutral share ranged from 5.5% to 17.6%. The least settled form of participation was business registration, which had both the lowest agreement (80.0%) and the highest neutral share (17.6%); formalisation therefore appears to be the form of participation that is least widely achieved. Engagement in agricultural activities (84.2%) and in agribusiness (84.3%) followed. The spread of responses was widest for off-farm entrepreneurial activity (SD = 0.998) and engagement in agricultural activities (SD = 0.969), which points to more varied experience on these items, and narrowest for cooperative participation (SD = 0.708). The interview evidence in Section 5.7 is consistent with high but uneven participation.

Factors facilitating participation and business development (Objective 2)

Eight facilitating factors were rated (Table 6), with item means from 4.24 to 4.64 and a composite mean of 4.44 (SD = 0.823). Mentorship and guidance from extension officers and experienced entrepreneurs received the highest rating (M = 4.64, SD = 0.613), with more than 90% agreement. Supportive government and NGO policies and programmes (M = 4.58), access to credit or financial support (M = 4.55; 92.7% agreement) and training programmes (M = 4.47) followed. Participation in cooperatives and youth networks (M = 4.41), market access and linkages (M = 4.35) and access to quality inputs and technology (M = 4.30) were also rated favourably. Access to adequate land had the lowest mean (M = 4.24), though 81.2% still agreed or strongly agreed that it was adequate.

Table 6. Factors facilitating youth participation and business development (n = 330)

Statement	1	2	3	4	5	Agree (%)	Mean	SD
Mentorship and guidance from extension officers and entrepreneurs	0.6	0.0	3.6	26.1	69.7	95.8	4.64	0.613
Supportive government and NGO policies and programmes	0.6	0.6	6.1	26.1	66.7	92.8	4.58	0.690
Access to credit or financial support	2.4	1.2	3.6	24.2	68.5	92.7	4.55	0.828
Training programmes provided by government or NGOs	3.6	0.6	5.5	26.1	64.2	90.3	4.47	0.913
Participation in cooperatives and youth networks	1.2	2.4	9.7	27.3	59.4	86.7	4.41	0.854
Market access and linkages	0.6	2.4	12.1	31.5	53.3	84.8	4.35	0.830
Access to quality inputs and technology	1.2	1.8	17.0	26.1	53.9	80.0	4.30	0.897
Access to adequate land	1.8	4.2	12.7	30.3	50.9	81.2	4.24	0.956
Composite							**4.44**	**0.823**

Note. Primary data (2026), n = 330. Columns 1 to 5 give the percentage choosing strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). Agree (%) combines categories 4 and 5. SD = standard deviation.

Across the items, the human and institutional supports (mentorship, policy, finance, training) were rated above the physical resources (land, inputs), which suggests that respondents see relationships and programmes as the main enablers in this setting.

Table 6 shows that agreement exceeded 90% for mentorship (95.8%), supportive policy (92.8%), access to credit (92.7%) and training programmes (90.3%), and stood at 86.7% for cooperatives and 84.8% for market linkages. Agreement was lowest for access to quality inputs and technology (80.0%) and access to adequate land (81.2%). These two items also had the largest neutral share (17.0% for inputs) and the highest combined disagreement (6.0% for land), and land showed the widest spread of responses (SD = 0.956). Physical resources therefore appear to be less reliably available to respondents than relational and institutional support, which fits the scarcity of arable land and water in a semi-arid region. Because the statements ask respondents to rate their own access, the ratings describe perceived availability and should not be read as a ranking of how much each factor matters for business outcomes.

Participation, business growth and socioeconomic development (Objective 3)

Perceived socioeconomic outcomes were rated very highly, with a composite mean of 4.54 (SD = 0.714). Respondents agreed that participation in agribusiness raises income (M = 4.59), that participation improves living standards (M = 4.61), that agribusiness contributes to household food security (M = 4.58) and that it strengthens decision-making skills (M = 4.56). They also agreed that their enterprises create jobs for other young people (M = 4.37), that digital tools improve business performance (M = 4.39), and that youth agribusiness contributes to community economic development and motivates other young people to take part (both above 4.5).

Table 7 gives the full distribution of responses on perceived outcomes. Agreement exceeded 90% for six of the eight statements: higher income (93.3%), improved living standards (94.0%), household food security (92.7%), stronger decision-making skills (91.5%), community economic development (94.0%) and motivating other youth (92.7%). The two lowest-rated statements, job creation for other young people (81.2% agreement) and the contribution of digital tools to business performance (81.8%), also had the largest neutral shares (17.6% each). This suggests that the wider multiplier effect and the gains from digital tools are less widely experienced than personal gains such as income and living standards. All of these are perceptions: the study did not measure income, employment or food security directly.

Table 7. Perceived socioeconomic outcomes of youth participation (n = 330)

Statement	1	2	3	4	5	Agree (%)	Mean	SD
Participation has increased my personal income	1.2	0.6	4.8	24.8	68.5	93.3	4.59	0.723
My business creates opportunities for other youth	0.0	1.2	17.6	24.2	57.0	81.2	4.37	0.812
Participation has improved my standard of living	0.0	0.6	5.5	26.7	67.3	94.0	4.61	0.621
My agribusiness contributes to household food security	1.2	0.0	6.1	24.8	67.9	92.7	4.58	0.715
Involvement has strengthened my decision-making skills	0.0	2.4	6.1	24.2	67.3	91.5	4.56	0.717
Digital tools or platforms have enhanced business performance	0.0	0.6	17.6	24.2	57.6	81.8	4.39	0.792
Youth agribusiness contributes to community economic development	0.0	0.6	5.5	26.7	67.3	94.0	4.61	0.621
My engagement motivates other youth to take part	1.2	0.0	6.1	24.8	67.9	92.7	4.58	0.715
Composite							**4.54**	**0.714**

Note. Primary data (2026), n = 330. Columns 1 to 5 give the percentage choosing strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). Agree (%) combines categories 4 and 5. SD = standard deviation.

Correlation analysis

All independent variables correlated positively and significantly with agricultural entrepreneurship and business development ($p < 0.01$). Participation in agribusiness and entrepreneurship had the strongest association ($r = 0.805$), followed by involvement in agricultural production ($r = 0.742$), participation in training and extension programmes ($r = 0.615$) and adoption of modern technologies ($r = 0.548$). The predictors were also correlated with one another, most notably production and agribusiness participation ($r = 0.789$), and training with agribusiness participation ($r = 0.585$). Participation in training and technology adoption were less strongly related ($r = 0.275$).

Table 8 gives the full correlation matrix. By conventional thresholds, the association with business development was very strong for participation in agribusiness ($r = 0.805$), strong for involvement in production ($r = 0.742$), and moderate to strong for training and extension ($r = 0.615$) and technology adoption ($r = 0.548$). Training and technology adoption were only weakly related to each other ($r = 0.275$), which may mean that these two supports tend to reach different young people: those who are trained are not necessarily those who adopt new technology. In contrast, production and agribusiness participation were so closely related ($r = 0.789$) that individual coefficients for these two predictors should be read with caution, since multicollinearity diagnostics were not reported (Section 7).

Table 8. Pearson correlation matrix of study variables (n = 330)

Variable	1	2	3	4	5
1. Involvement in agricultural production	1				
2. Participation in agribusiness and entrepreneurship	.789**	1			
3. Adoption of modern agricultural technologies	.490**	.513**	1		
4. Participation in training and extension programmes	.448**	.585**	.275**	1	
5. Agricultural entrepreneurship and business development	.742**	.805**	.548**	.615**	1

Note. Primary data (2026). ** Correlation is significant at the 0.01 level (two-tailed).

Regression analysis

The four-predictor model was statistically significant (Tables 9 and 10), $F(4, 325) = 219.38$, $p < 0.001$, and explained 73.0% of the variance in agricultural entrepreneurship and business development ($R = 0.854$, $R^2 = 0.730$, adjusted $R^2 = 0.726$; standard error of the estimate = 0.111). The Durbin-Watson statistic of 2.151 indicates no problematic autocorrelation in the residuals. All four predictors were positive and significant at $p < 0.001$ (Table 11).

Table 9. Regression model summary

R	R^2	Adjusted R^2	Std. error of estimate	Durbin–Watson
0.854	0.730	0.726	0.11050	2.151

Note. Predictors: involvement in agricultural production, participation in agribusiness and entrepreneurship, adoption of modern agricultural technologies, and participation in training and extension programmes. Dependent variable: agricultural entrepreneurship and business development.

Table 10. Analysis of variance for the regression model

Source	Sum of squares	df	Mean square	F	Sig.
Regression	10.715	4	2.679	219.380	< .001
Residual	3.968	325	0.012		
Total	14.684	329			

Note. Primary data (2026). The regression sum of squares is almost three times the residual sum of squares, so the model accounts for most of the variation in the outcome.

Table 11. Multiple regression of agricultural entrepreneurship and business development on participation variables

Predictor	B	SE	β	t	p
(Constant)	0.048	0.167		0.285	.776
Involvement in agricultural production	0.259	0.048	0.255	5.356	< .001
Participation in agribusiness and entrepreneurship	0.349	0.048	0.386	7.273	< .001
Adoption of modern agricultural technologies	0.135	0.028	0.161	4.739	< .001
Participation in training and extension programmes	0.248	0.038	0.230	6.467	< .001

Note. Dependent variable: agricultural entrepreneurship and business development; N = 330.

The fitted equation is $Y = 0.048 + 0.259X_1 + 0.349X_2 + 0.135X_3 + 0.248X_4$. In standardised terms, participation in agribusiness and entrepreneurship is the strongest predictor, followed by agricultural production, training and extension, and technology adoption.

Read as unstandardised effects, and holding the other predictors constant, a one-point rise in the agribusiness participation score is associated with a 0.349-point rise in the business-development score, against 0.259 for production, 0.248 for training and extension, and 0.135 for technology adoption. The constant (0.048) is not significantly different from zero ($p = .776$) and has no substantive interpretation here. Because the outcome and the predictors are perception scales collected in the same questionnaire, and because the outcome overlaps conceptually with the predictors, the high explained variance (73.0%) is likely to overstate the strength of the underlying relationships. It should be read as evidence of strong association among respondents' self-assessments, not as a measure of how far participation would change business results (Section 7).

Qualitative findings from key-informant interviews

Interviews with key informants, including a district agricultural officer, cooperative leaders, extension workers, a project coordinator, a youth agripreneur, a local government representative and a community leader, were used to explain and qualify the questionnaire results. Five themes emerged (Table 12).

Table 12. Themes from key-informant interviews

Theme	Representative evidence	Link to survey findings
Participation is rising but constrained	"most young people are now engaging in small-scale farming and livestock keeping, especially due to unemployment challenges" (District Agricultural Officer). "youth involvement is higher than before, but still limited by resources and access to land" (Cooperative Leader).	High participation means (Table 5); land rated lowest (Table 6)
Low-capital, fast-return activities	"young people mostly engage in goat and camel rearing, vegetable gardening, and selling produce in local markets" (Extension Officer). "many of us combine farming with buying and selling agricultural products to earn income faster" (Youth Agripreneur).	Trading and agritech dominate business types (Table 4)
Uneven technology adoption	"some youths are involved in agribusiness such as food processing and marketing, but many still rely on traditional methods" (Government Agriculture Officer). "training programs have improved awareness, and some youths are now using improved seeds and simple irrigation systems" (Project Coordinator).	Technology adoption has the smallest regression weight (Table 11)
Cooperatives and training help, but coverage is limited	"cooperatives have helped young farmers access inputs, training, and markets that they could not access individually" (Cooperative Chairman). "training programs are effective, but coverage is still not enough for all youth in rural areas" (Extension Worker).	Cooperatives and training rated highly (Table 5); a quarter report no training (Table 4)
Barriers and community benefits	"lack of capital, limited land access, and weak market linkages are the biggest challenges facing youth" (Local Government Representative). "when youth are engaged in farming, the whole community benefits through better food supply and employment creation" (Community Leader).	High perceived outcomes (Table 7); finance and land ratings are more favourable than informants imply

Note. Interviews conducted in 2025. Quotations are as recorded by the researcher.

Informants described youth participation as moderate but steadily increasing, driven by unemployment and by supportive programmes, and as concentrated in low-capital, fast-return activities such as livestock keeping, vegetable gardening and trading. They saw technology adoption as partial: improved seeds and simple irrigation were spreading after training, but many young people still relied on traditional methods. Cooperatives were credited with giving young people access to inputs, training and markets they could not reach alone, although informants said that training coverage did not yet extend to all rural youth. Informants named lack of capital, limited land and weak market linkages as the main barriers, and recommended wider access to credit, stronger training and better market infrastructure. They also agreed that youth involvement benefits whole communities through better food supply and employment.

The interviews corroborate the survey on the pattern of participation but are more guarded in tone. Informants stressed capital and land as binding constraints, whereas questionnaire respondents rated their access to finance and land favourably. This difference is discussed in Section 6.

Discussion

Participation is broad and runs along the value chain. The high composite mean for participation, and the strong cooperative and training involvement in particular, indicate that young people in Ali-Sabieh are active well beyond primary production. This pattern matches the argument that youth engagement in dryland agriculture is concentrated in value-added, service and technology-oriented activities rather than commodity farming alone (FAO, 2024; FAO, 2025). Cooperative membership at the top of the ranking is consistent with social capital theory: networks supply the information, finance and mentorship that individuals lack (Putnam, 2000).

Support systems matter more than raw resources. Respondents rated mentorship, policy support, finance and training above land and inputs. This is consistent with the entrepreneurial ecosystem view that outcomes depend on the surrounding network of supports and not only on individual endowments (Isenberg, 2021), and with human capital theory's emphasis on skills (Becker, 1964). The relatively lower rating of land is unsurprising in a semi-arid region with little arable land, and it suggests that business models built on value addition, trading and technology may be better suited to Ali-Sabieh than land-intensive ones.

Agribusiness participation is the strongest predictor. That participation in agribusiness and entrepreneurship carries the largest standardised effect ($\beta = 0.386$) fits the idea that learning-by-doing in market-facing activity builds the commercial skills that growth requires. Training and extension ($\beta = 0.230$) ranks above technology adoption ($\beta = 0.161$), which echoes findings that digital and technical tools yield the most when paired with the skills to use them (Ouma et al., 2023; McIntosh & Zeitlin, 2022). Under diffusion of innovations theory, the lower weight for technology may also reflect that adoption is still at an early stage in the region (Rogers, 2003).

Perceived outcomes are strongly positive. Respondents reported gains in income, living standards, food security and decision-making, and said their enterprises create work for others and encourage peers. This is the multiplier effect described in the literature (ILO, 2023; IFAD, 2023). It is worth stressing that these are perceptions: the study did not measure income, employment or food security directly.

Integrated support is the practical implication. The high intercorrelations among predictors, and the fact that all four retain independent significance, suggest that training, technology and enterprise participation reinforce each other. Programmes that provide them together with finance and mentorship are more likely to work than isolated interventions, a conclusion that agrees with the integrated approaches advocated by FAO (2023) and the World Bank (2024).

Survey and interview evidence converge on the pattern but differ in tone. Informants describe participation as moderate but rising and point to capital and land as binding constraints, whereas questionnaire respondents rated their access to finance and land favourably. Two explanations are plausible. The respondent pool includes many cooperative members, programme beneficiaries and service providers who are, by construction, connected to support, and self-reported ratings may be inflated by social desirability. The divergence argues for treating the very high survey means as an upper bound on how widely the benefits are felt.

Finance and liquidity. The favourable ratings of credit access ($M = 4.55$) sit uneasily alongside Rwandan evidence that liquidity constraints limit youth enterprise even when skills training is available (McIntosh & Zeitlin, 2022), and alongside evidence from semi-arid East Africa that access to credit is associated with business performance among young agripreneurs (Mwangi et al., 2023). Because 26.7% of respondents reported no financial support, the survey average may conceal a group for whom liquidity remains binding. Disaggregating results by access to finance is a useful next step.

Value addition and trade rather than land. Almost half of respondents (46.1%) reported agritech-related activity and a further 23.6% reported trading and marketing, compared with 7.9% in crop production. In a region with little arable land, this pattern suggests that young people enter agriculture through service, trade and technology niches rather than primary production, which is consistent with arguments that youth engagement in dryland systems concentrates in value-added and service activity (FAO, 2024; FAO, 2025). It also means that the sample is not mainly a sample of farmers, which matters for generalisation.

Theoretical implications. The results are consistent with the resource-based, human capital and diffusion of innovations perspectives: production and agribusiness participation (resources), training and extension (human capital) and technology adoption each retained an independent positive association with business development. The ecosystem and social capital arguments are supported by the high ratings for mentorship, policy support and cooperatives and by the interview evidence, but they were not modelled statistically, so the study cannot say how much additional variance in business development they would explain. A model that adds enabling conditions, ideally as moderators of the link between participation and business development, would give those theories a direct test.

Implications for policy and practice. Three points follow for programme design. First, support should be bundled. The weak correlation between training and technology adoption ($r = 0.275$) suggests that these supports may not reach the same people, so programmes that deliver them together with finance and mentorship are more likely to produce joint gains (FAO, 2023; World Bank, 2024). Second, cooperatives are the most visible institutional channel and could deliver credit, inputs and market information, provided coverage widens beyond current members, as informants noted. Third, because respondents describe much of their activity as trading, processing and technology services, programmes in Ali-Sabieh should not assume that land is the main entry route for young people.

Limitations

Several limitations should be kept in view when interpreting the results.

Age composition. The study defines youth as 15–35 years, yet about 70% of respondents were aged 35 or older (32.7% aged 35–44, 27.3% aged 45–54 and 9.7% aged 55 or above). The results therefore describe a broader group of agribusiness actors, including programme staff and leaders, than the youth definition implies. Replication with a sample restricted to the 15–35 range, or an age-stratified analysis, is needed before conclusions are applied to young people specifically.

Cross-sectional, self-reported data. All variables were collected at one point in time through the same questionnaire. The associations cannot be read as causal, and common-method bias and social-desirability bias may inflate relationships. Very high item means (mostly above 4.2) also point to a ceiling effect and limited variation.

Measurement and model scope. The dependent variable and the four predictors are perception scales, and the outcome measure overlaps conceptually with the predictors, which may help explain the high explained variance. The enabling factors discussed in Objective 2, such as finance and market access, were assessed descriptively and were not entered into the regression model. Multicollinearity diagnostics were not reported, although some predictors correlated at about 0.79.

Sample composition. A census of 400 identified actors was attempted, and non-response was 17.5%. The sample includes respondents in several roles (for example beneficiaries, extension providers and policy influencers), and only 8.5% identified as youth farmers, so findings may not generalise to primary producers.

CONCLUSIONS AND RECOMMENDATIONS

Within the limits above, the study supports three conclusions for Ali-Sabieh in 2020–2025. First, participation in agricultural entrepreneurship and business is high and diverse, extending from production to processing,

marketing, cooperatives and innovation. Second, respondents consider access to finance, mentorship, training, supportive policy and cooperative membership to be the key facilitators. Third, participation in agribusiness, agricultural production, training and technology adoption are each positively and significantly associated with business development, together explaining almost three-quarters of its variation, and respondents link participation to higher incomes, jobs, food security and community development.

Table 13 summarises the findings against the three objectives.

Table 13. Summary of findings by objective

Objective	Main finding	Implication
1. Level and form of participation	Participation is high (composite M = 4.40) and spans production, agribusiness, cooperatives, training, innovation and market-seeking. Cooperatives (M = 4.57) and training (M = 4.54) score highest; business registration is the least widely achieved form (80.0% agreement).	Support should extend along the value chain and use cooperatives as a delivery channel.
2. Facilitating factors	Mentorship (M = 4.64), policy support (4.58), finance (4.55) and training (4.47) are rated above access to inputs and technology (4.30) and land (4.24); composite M = 4.44.	Relational and institutional support matters more than physical resources in this semi-arid setting.
3. Participation, business growth and development	All four predictors are positively and significantly associated with business development (R^2 = 0.730); agribusiness participation is strongest (β = 0.386). Perceived outcomes are high (composite M = 4.54).	Integrated packages combining enterprise participation, training and technology are promising, but the evidence is associational.

Note. Primary data (2026).

The study recommended the following;

For policy makers. Design youth agribusiness programmes as integrated packages that combine finance, training, mentorship and technology access, and target them to the 15–35 age group explicitly. Support market-oriented value-chain activity, including processing, trading and cross-border marketing, which suit a region with little arable land.

For practitioners (NGOs, cooperatives and extension services). Strengthen practical training, mentorship and business incubation, and use cooperatives as the delivery channel for credit, inputs and market information. Pair technology introduction with training in its use.

For financial institutions. Develop credit and savings products suited to young agripreneurs, and widen access for the quarter of respondents who reported no financial support.

For researchers. Use longitudinal and quasi-experimental designs to test causal effects, measure income, employment and food security directly, include finance and market access in the explanatory model, restrict samples to the 15–35 range, and compare Ali-Sabieh with other Djiboutian regions.

Suggestions for future research

Four lines of inquiry follow from the findings. First, comparative studies across Djibouti's regions would show whether the high engagement observed in Ali-Sabieh is typical or reflects local resources, institutional support and market availability. Second, longitudinal and quasi-experimental studies are needed to test whether agritech adoption, finance and training sustain and grow youth-led enterprises over time, and to separate the effect of participation from selection into participation. Third, qualitative work should examine gender-specific barriers and opportunities, which a questionnaire survey cannot capture in depth. Fourth, studies of innovation, climate resilience and digital transformation in youth agribusiness are warranted.

Acknowledgements

The author thanks the supervisor, Dr. Pancras Ndokoye, the Department of International Development Studies, and the respondents and officials in Ali-Sabieh who gave their time.

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