

INNOVATIVE AGRICULTURAL PRACTICES FOR YOUTH EMPOWERMENT IN ANIMAL PRODUCTION

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Abstract

Youth participation in animal production is crucial for food security, rural development, and economic growth. However, rural youth face challenges such as limited access to land, capital, modern livestock-rearing techniques and market opportunities, which discourage their involvement in the sector. This paper explores innovative agricultural practices that can empower young people in rural areas by making animal production more attractive, profitable, and sustainable. These innovations include precision livestock farming, hydroponic fodder production, climate-smart livestock systems, digital platforms for animal health management and e-commerce solutions for livestock marketing. Through case studies and empirical data, this paper highlights the impact of these innovations on increasing productivity, reducing losses, enhancing sustainability and challenges hindering youth involvement in animal husbandry and proposes policy recommendations to foster a more inclusive and innovative livestock sector. The aims and objectives of this work includes accessing level of awareness and adopting innovation, benefits and challenges of innovation, roles of government, future prospect of livestock farming among youth and provide recommendations that will improve participation of youth in livestock farming. Questionnaire was drafted and sent out through google, data was harvested and analysed, and It was discovered that 91% are aware of that there are new innovation while 8.5% are not aware, 110 people said these innovations has increased their production, 57 people said it reduces diseases outbreak. Some has refused to adopt new techniques because of the cost, some said they are limited by finances. 78% of response has received support from the government while 21.9% has not received any. Policies that will increase accessibility to land, more funding, training and stronger market connections are suggested to improve more participation of youth in livestock farming.

Keywords: Youth Empowerment, Animal Husbandary, Live Stock Farming, Agricultural Practices

Introduction

Youth are broadly defined as individuals whose ages fall within the ranges of 15–24 years and 15–35 years, according to the United Nations and Akall (2021). Africa is home to the youngest population in the world, with approximately seven out of every ten people being under the age of 30 (NEPAD, 2022; United Nations, 2022). This demographic structure presents both an opportunity and a challenge. If adequately harnessed, the youthful population can drive economic growth, innovation, and sustainable development. However, failure to equip young people with the necessary knowledge, skills, and resources may lead to unemployment, poverty, and social instability. Youth empowerment, therefore, refers to the process of enabling young people to overcome developmental constraints by providing them with access to education, skills training, financial resources, and supportive institutional frameworks (NEPAD, 2022).

Agriculture remains a cornerstone of rural livelihoods, and within this sector, livestock farming plays a particularly critical role. Livestock production provides food in the form of meat, milk, and eggs, generates employment along value chains, and serves as a reliable source of income for rural households. In Africa and globally, the livestock sector contributes approximately 35% of agricultural gross domestic product (GDP) and supports the livelihoods of more than 1.3 billion people worldwide (FAO, 2019; Holden et al., 2024). Beyond its economic contributions, livestock farming enhances food and nutrition security, provides draught power and manure for crop production, and

acts as a form of financial security for smallholder farmers, especially in rural areas where access to formal financial services is limited. Despite the importance of livestock farming, youth participation in animal production has been steadily declining across many African countries. Several structural and socio-economic barriers hinder young people from entering and remaining in the livestock sector. These challenges include limited access to land and productive assets, poor access to credit and financial services, inadequate extension support, and the persistence of outdated and labor-intensive husbandry practices. In addition, climate change-related risks such as droughts, heat stress, disease outbreaks, and feed shortages have increased the vulnerability of livestock systems, further discouraging youth involvement. Negative perceptions of agriculture as an unprofitable and physically demanding occupation also contribute to low youth engagement in animal production (FAO, 2019).

Nevertheless, the livestock sector is undergoing a transformation driven by technological advancements and innovative agricultural practices, which present new opportunities for youth engagement. Emerging innovations such as precision livestock farming, hydroponic fodder production, digital veterinary and advisory services, and climate-smart livestock systems are reshaping animal production. Precision livestock technologies, including sensors and data-driven monitoring tools, improve animal health and productivity while reducing labor requirements. Hydroponic fodder systems offer efficient and climate-resilient feed solutions, particularly in areas affected by land and water scarcity. Digital platforms provide young farmers with access to veterinary services, market information, and training, while climate-smart practices enhance resilience to environmental shocks and promote sustainable resource use. This paper examines how these innovative agricultural practices can empower youth in rural areas by lowering entry barriers, increasing productivity, and improving profitability in livestock farming. It also explores how youth-led adoption of modern livestock technologies can contribute to improved food security, rural employment, and sustainable agricultural development.

Research Objectives

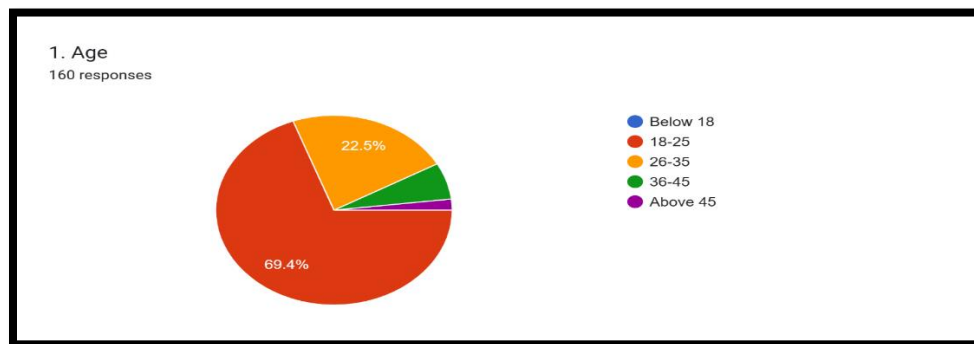
- i. To assess the level of awareness and adoption of innovative livestock farming practices among youth.
- ii. To identify the benefits and challenges associated with the use of innovative agricultural practices in animal production.
- iii. To examine the role of government and institutional support in promoting youth participation in modern livestock farming.
- iv. To explore the future prospects of livestock farming as a career choice for youth.
- v. To provide recommendations for enhancing youth involvement in animal production through innovative practices.

Methodology

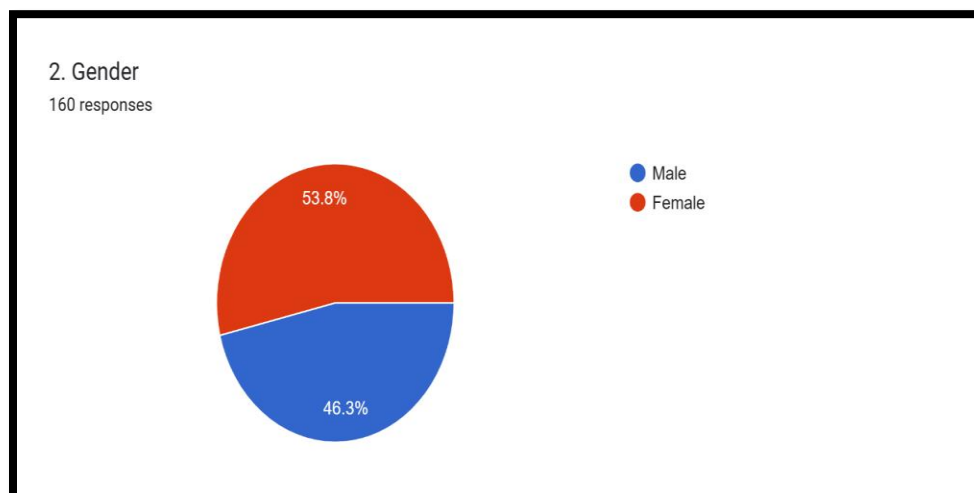
This study adopted a quantitative research approach to examine the role of innovative agricultural practices in empowering youth engaged in animal production. Primary data were collected using a structured questionnaire designed to capture information on respondents' demographic characteristics, level of participation in animal production, awareness and adoption of innovative livestock practices, and perceived benefits and constraints associated with these innovations. The questionnaire was developed using Google Forms to ensure ease of distribution, accessibility, and efficient data collection. This online approach enabled the researchers to reach a wide range of respondents across different locations within a relatively short period. A total of 250 questionnaires were distributed electronically to youths involved or interested in animal production. Participation in the survey was voluntary, and respondents were informed of the purpose of the study prior to completing the questionnaire. Out of the 250 questionnaires distributed, 162 were completed and returned, representing a response rate of approximately 64.8 percent. The completed questionnaires were screened for completeness and consistency, and only valid

responses were included in the final analysis. The selected sample size was considered adequate for drawing meaningful insights related to youth engagement and the adoption of innovative agricultural practices in animal production. Data obtained from the survey were coded and analyzed using descriptive statistical techniques, including frequencies, percentages, means, and graphical representations. Descriptive statistics were used to summarize the data, identify patterns, and provide a clear understanding of respondents' characteristics and responses. This analytical approach was appropriate for achieving the study's objectives, as it allowed for the systematic description of trends related to youth empowerment, innovation adoption, and challenges in animal production.

Results and Discussions

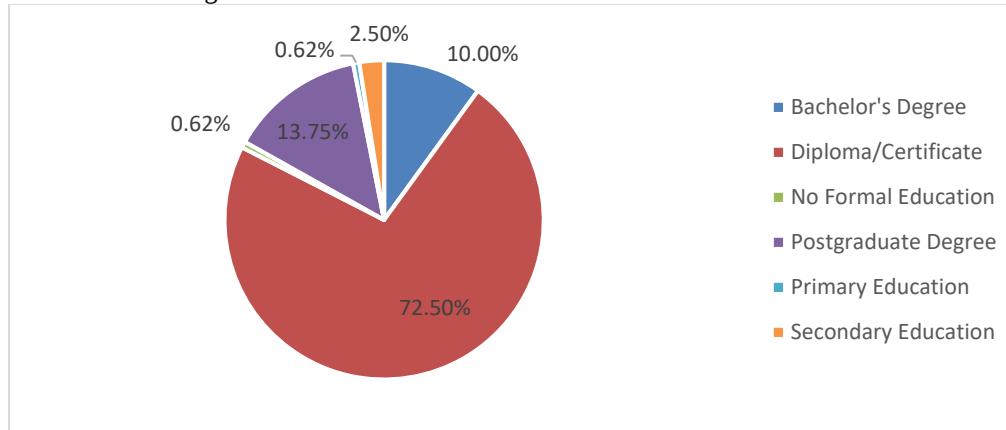


The chart above reveals the age distribution of respondents. Majority (69.4%) fall within the 18–25 age group, indicating a strong youth representation in the survey. This is followed by 22.5% in the 26–35 age group, while smaller proportions are seen among those aged 36–45 and above 45, with minimal or no responses from individuals below 18. This suggests that the findings are largely reflective of perspectives from young adults, particularly those in their early adulthood.

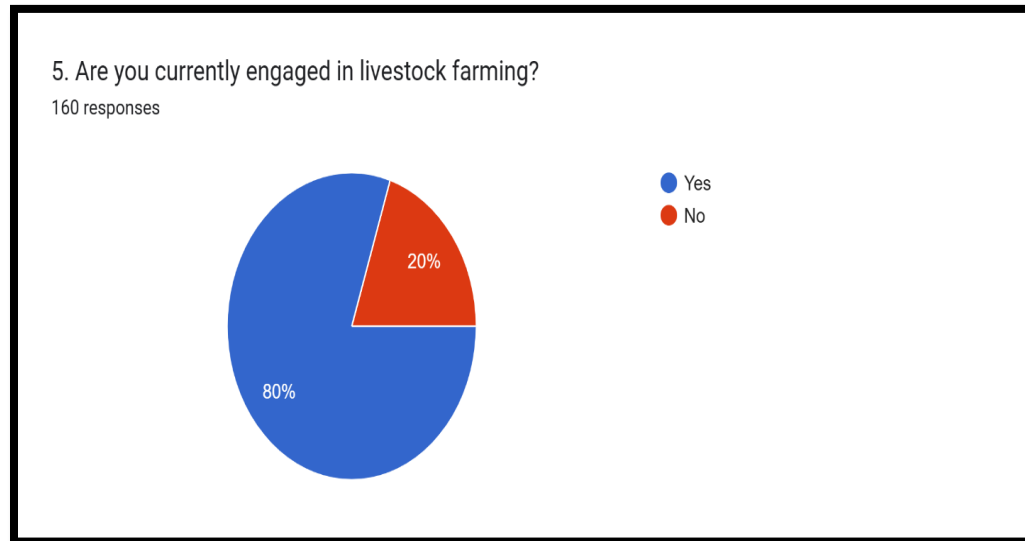


The gender distribution of respondents as shown in the chart above reveals a fairly balanced participation, with females slightly outnumbering males. Specifically, 53.8% of the respondents are female, while 46.3% are male. This indicates a relatively even gender representation in the survey, suggesting that insights drawn from the data reflect perspectives from both genders almost equally.

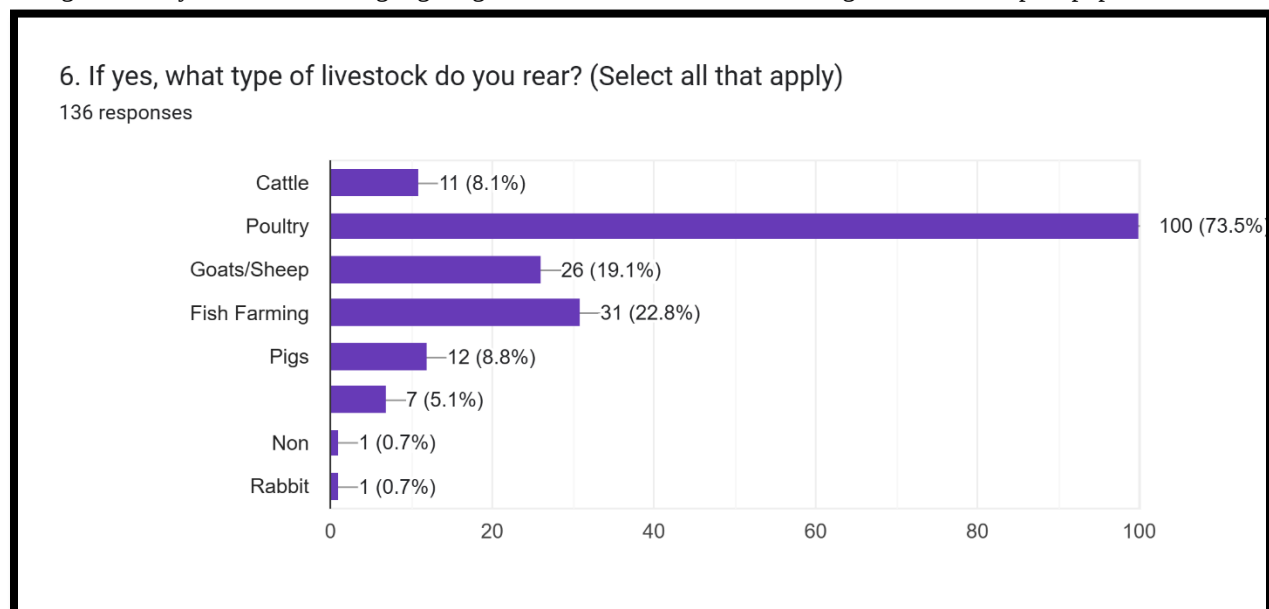
Educational Background



The educational background distribution of respondents involved in livestock farming as shown in the chart above reveals that the majority (72.50%) have attained diploma certificate, followed by 13.75% of the sampled individuals have attained a post graduate degree. About 10% are bachelor's degree holder, while only 2.50% have secondary education and just 0.625% and 0.625% attain primary education and no formal education respectively. This implies that access to or interest in innovative livestock practices is more common among those with higher education levels, likely due to greater exposure to technology, training, and support networks.

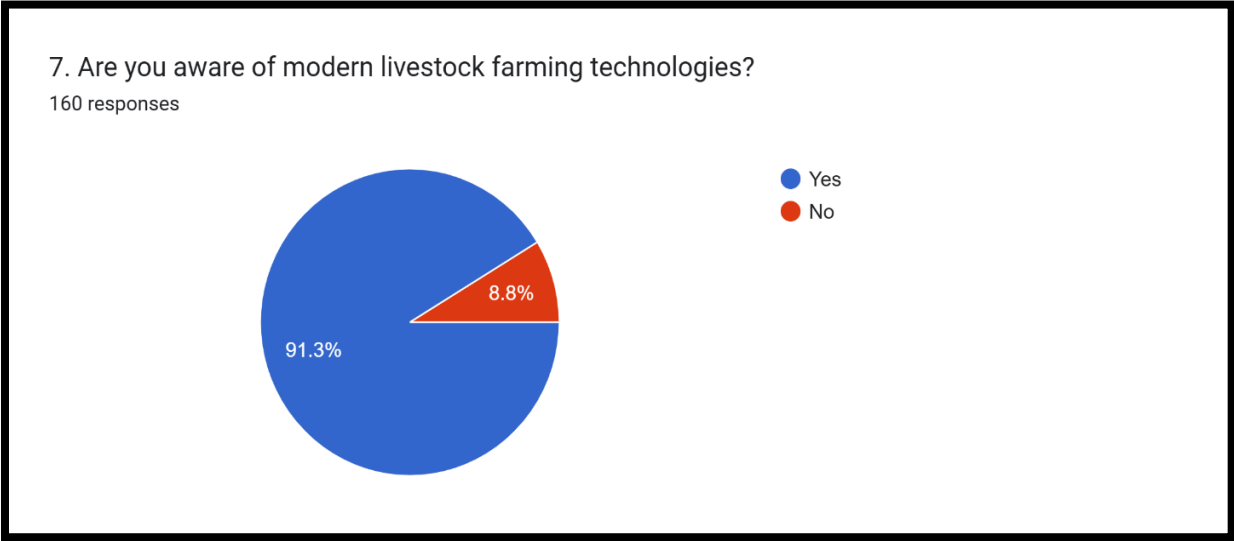


The chart above indicates that a significant majority of respondents (80%) are currently engaged in livestock farming, while only 20% are not. This suggests a high level of active participation in livestock-related activities among the surveyed individuals, highlighting the relevance of livestock farming within the sampled population.

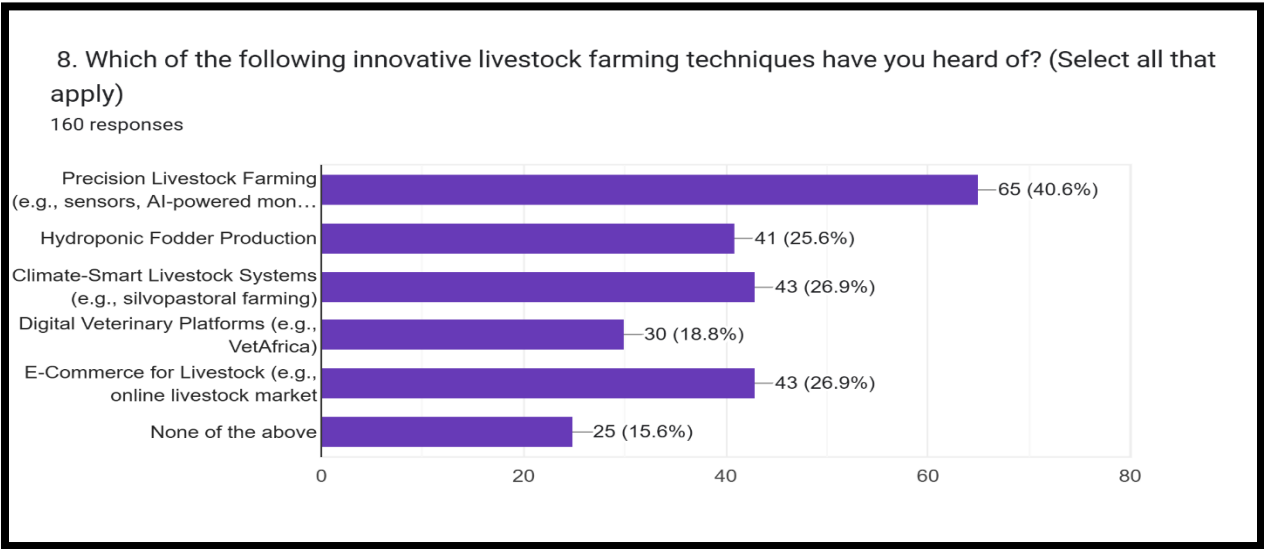


The result shown in the chart above illustrates the types of livestock reared by respondents, with poultry emerging as the most common, reported by 73.5% of the 136 respondents. This indicates a strong preference for poultry farming, possibly due to its relatively low startup costs and quick return on investment. Fish farming and the rearing of goats or sheep also show notable engagement, with 22.8% and 19.1% respectively, suggesting a growing interest in alternative sources of animal protein. Other forms of livestock such as pigs (8.8%), cattle (8.1%), and less common

options like rabbits and unspecified animals (each at 0.7%) were less frequently mentioned. The results further highlight a diverse approach to livestock farming, though poultry clearly dominates the sector among the surveyed population.

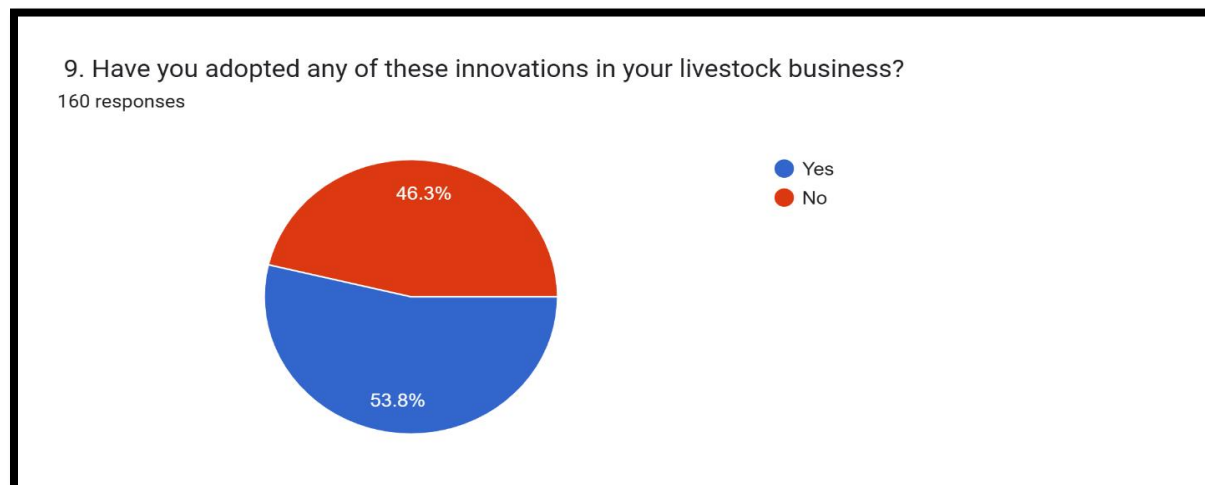


The chart above indicates that a significant majority of respondents (91.2%) are aware of modern livestock farming technologies, while only 8.8% are not. This suggests a high level of awareness among the surveyed individuals.

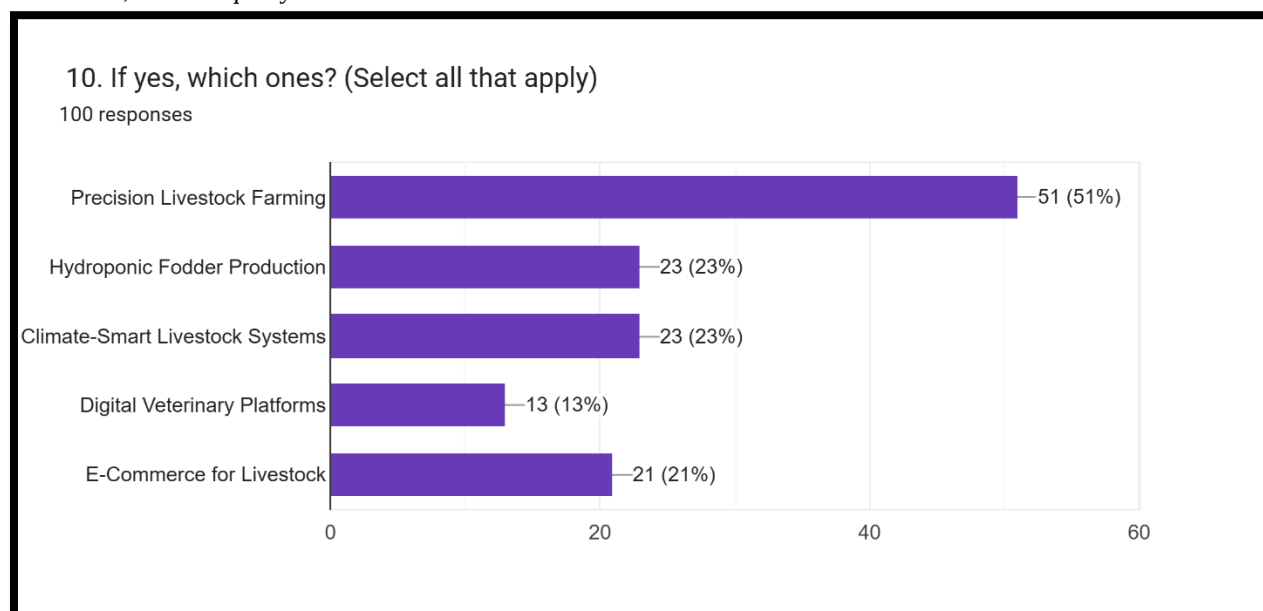


The chart presents responses to the question: "Which of the following innovative livestock farming techniques have you heard of?" among the surveyed individuals. The most recognized technique is Precision Livestock Farming (e.g., sensors, AI-powered monitoring), acknowledged by 40.6% of participants. Climate-Smart Livestock Systems

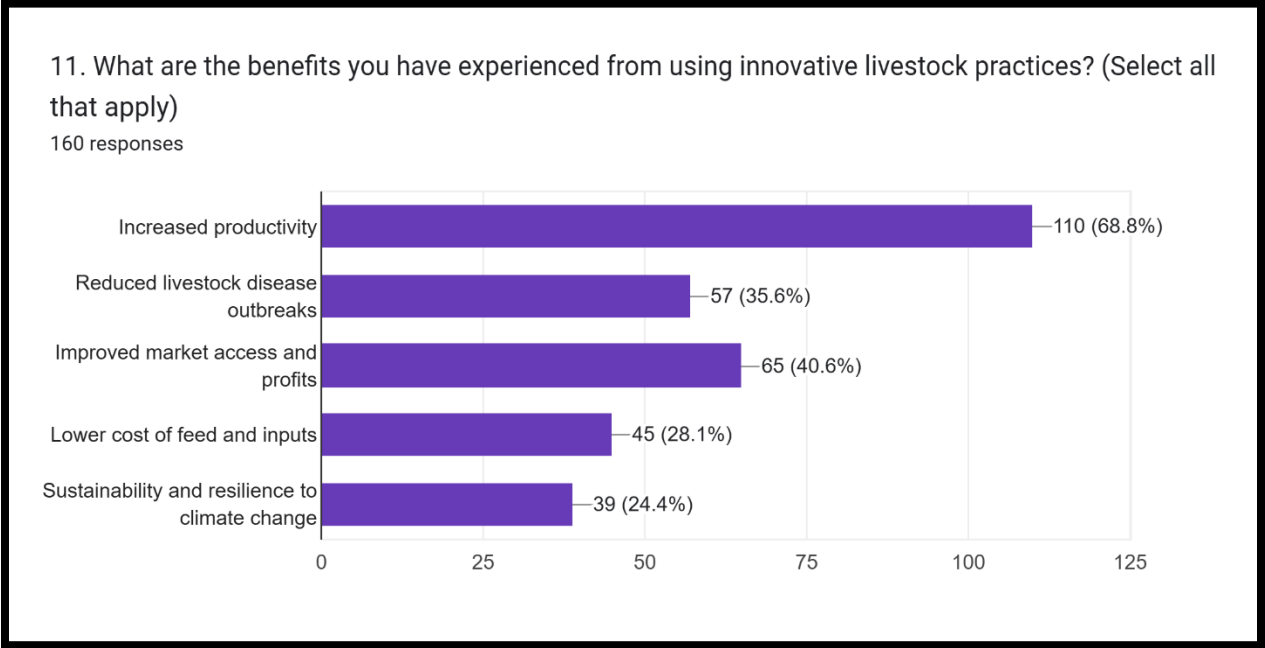
and E-Commerce for Livestock both follow at 26.9%, indicating moderate awareness of sustainable and digital market-based solutions. Hydroponic Fodder Production was known to 25.6%, reflecting some familiarity with alternative feed systems, while Digital Veterinary Platforms like Vet Africa were the least recognized among the listed techniques, known by only 18.8% of respondents. Notably, 15.6% indicated they were unfamiliar with any of the options, suggesting a knowledge gap in innovative livestock technologies. Overall, while awareness of advanced farming methods exists, there's still considerable room for education and exposure.



The chart above indicates that a significant majority of respondents (53.8%) have adopted innovations in their livestock business, while 46.2% are not. This indicates a relatively even representation in the survey, suggesting that insights drawn from the data reflect perspectives from both participants who have adopted innovations and those that did not, almost equally.



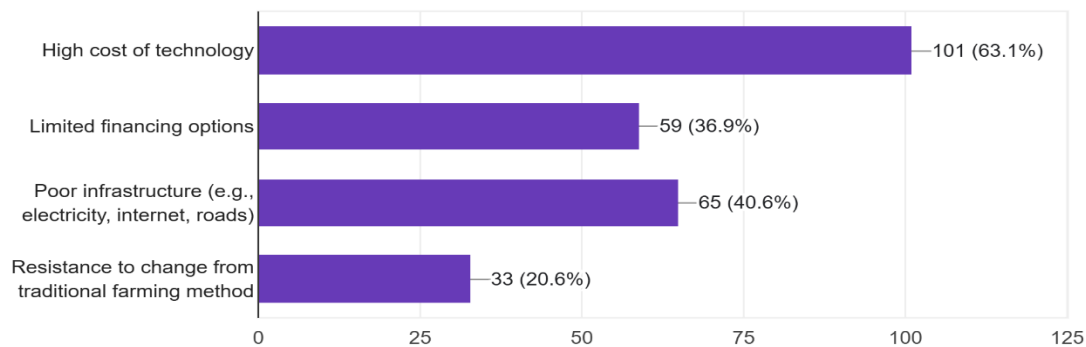
The chart shows the responses of the participants who were asked which innovative livestock farming techniques they have actually used or engaged with. Precision Livestock Farming tops the list with 51% of the responses, indicating it is the most commonly practiced or adopted among the techniques listed. Hydroponic Fodder Production and Climate-Smart Livestock Systems each received 23% of responses, reflecting a growing but moderate level of practical application. E-Commerce for Livestock follows closely at 21%, suggesting some use of online platforms for livestock trade. Digital Veterinary Platforms had the lowest uptake at 13%, pointing to either limited access or awareness.



The chart illustrates the various benefits respondents have gained from using innovative livestock practices. The most significant benefit reported was increased productivity, cited by 68.8% of respondents, highlighting the efficiency gains achieved through innovation. Improved market access and profits (40.6%) and reduced livestock disease outbreaks (35.6%) were also notable benefits, reflecting both economic and health improvements. Additionally, lower cost of feed and inputs (28.1%) and sustainability and resilience to climate change (24.4%) were mentioned, though by a smaller portion of respondents. These insights suggest that modern livestock practices offer multifaceted advantages, especially in enhancing productivity and profitability.

12. What challenges have you faced in adopting innovative livestock farming practices? (Select all that apply)

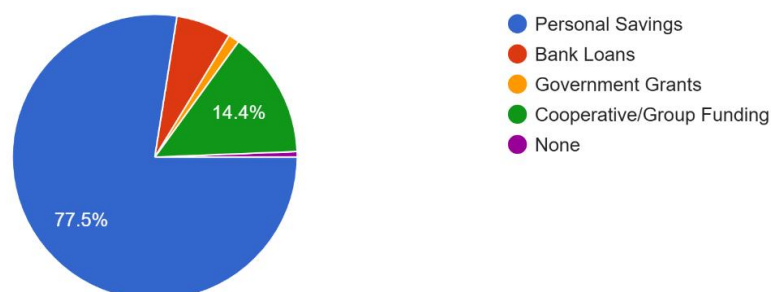
160 responses



The chart highlights the key challenges faced by respondents in adopting innovative livestock farming practices. The most common issue, reported by 63.1%, is the high cost of technology, indicating that affordability is a major barrier to modernization. This is followed by poor infrastructure (40.6%)—such as inadequate electricity, internet, and roads—and limited financing options (36.9%), both of which significantly hinder the adoption of modern practices. Additionally, resistance to change from traditional farming methods was cited by 20.6% of respondents. These findings suggest that while there is interest in innovation, systemic barriers like costs, infrastructure, and financing need to be addressed to facilitate the transition to modern livestock farming.

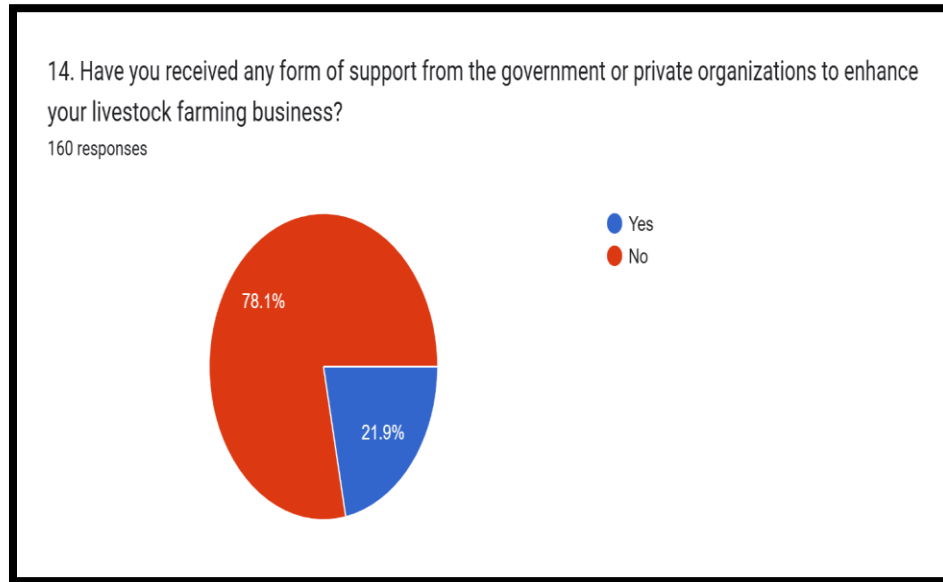
13. How do you finance your livestock farming activities?

160 responses

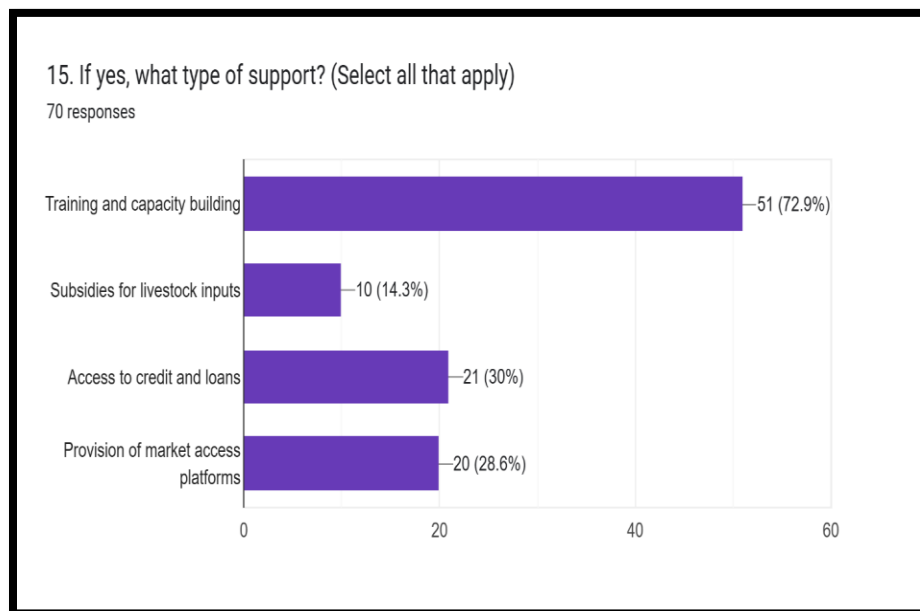


The chart reveals that the majority of respondents rely on personal savings to finance their livestock farming activities, with 77.5% indicating this as their primary source of funding. Cooperative or group funding comes in a

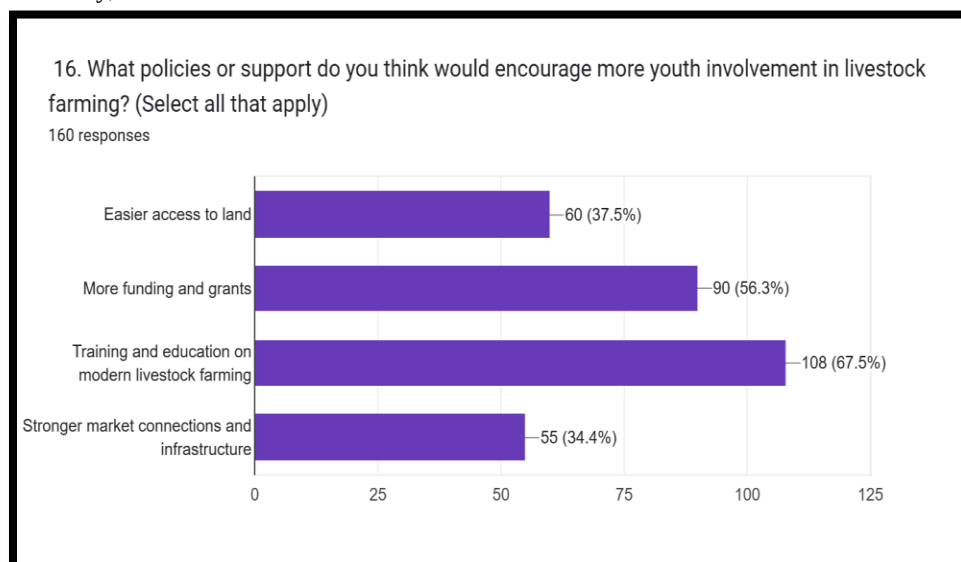
distant second at 14.4%, while only a small fraction utilises bank loans, government grants, or report receiving no funding at all. This heavy dependence on personal savings suggests limited access to formal financial support systems and highlights the need for improved financial inclusion, such as easier access to loans, grants, and cooperative funding models, to help young livestock farmers scale and sustain their businesses.



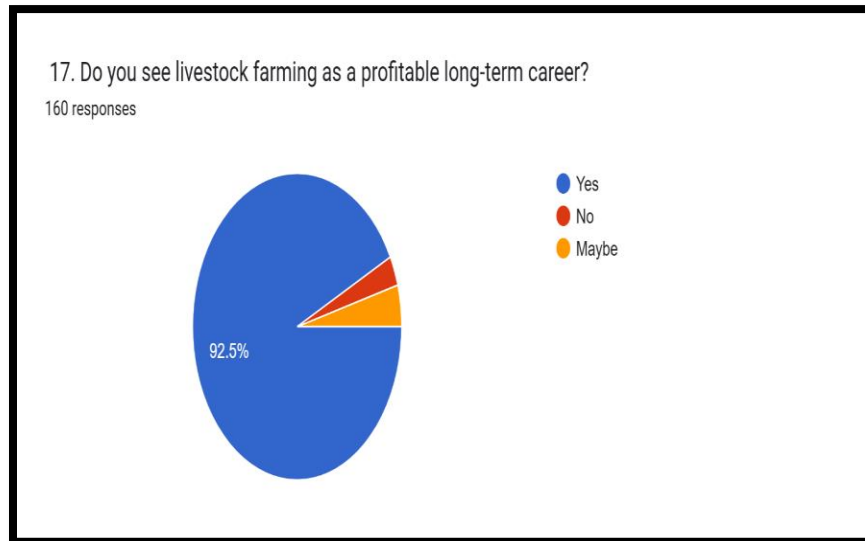
The chart indicates that a significant majority of respondents have not received any form of support from the government or private organizations to enhance their livestock farming businesses. Among the participants, 78.1% reported not receiving any support, while only 21.9% confirmed they had. This reveals a major gap in the availability or accessibility of support services for youth involved in livestock farming, suggesting a need for more inclusive and widespread intervention programs to empower young farmers and improve their chances of success.



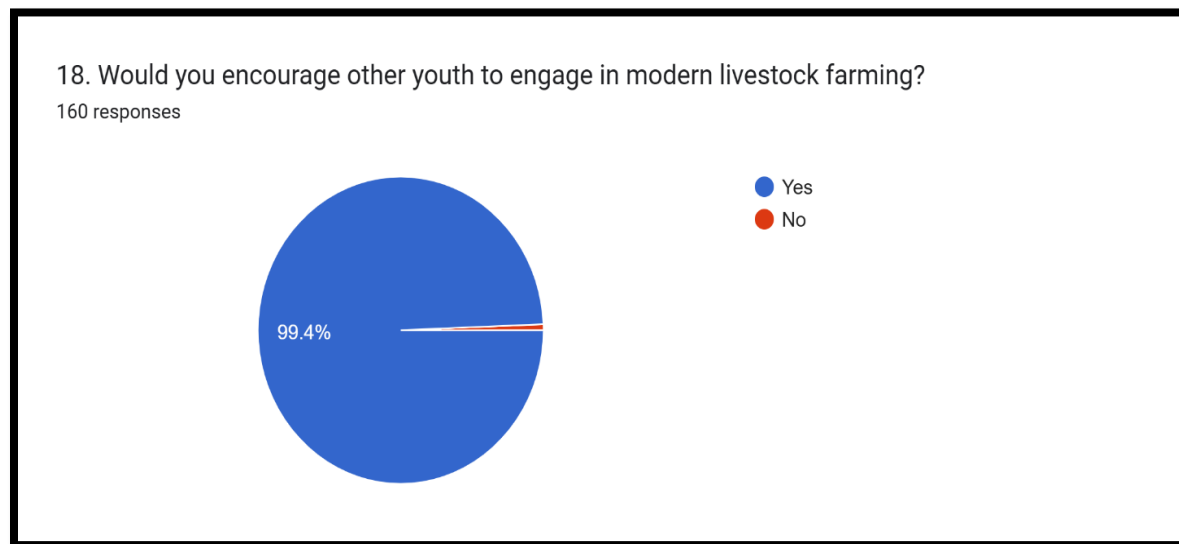
The chart presents the types of support respondents believe would be most beneficial for encouraging youth participation in livestock farming. A significant majority (72.9%) identified training and capacity building as the most needed form of support. This was followed by access to credit and loans (30%) and the provision of market access platforms (28.6%). Subsidies for livestock inputs were the least selected option, with only 14.3% indicating it as a priority. These results suggest that enhancing skills and knowledge is viewed as the most impactful way to support young people in livestock farming, while financial tools and market access also play important, though secondary, roles.



The chart above highlights the key policies and support mechanisms that respondents believe would encourage greater youth involvement in livestock farming. Out of 160 respondents, the majority (67.5%) indicated that training and education on modern livestock farming would be the most effective form of support. Followed by more funding and grants, selected by 56.3% of respondents. Easier access to land was also seen as important by 37.5%, while stronger market connections and infrastructure were noted by 34.4%. These responses suggest that knowledge-building, financial assistance, and improved access to resources and markets are critical areas that need to be addressed to foster youth participation in the livestock farming sector.



The chart above reveals a strong belief among respondents in the profitability of livestock farming as a long-term career. About 92.5% responded "Yes," indicating they view it as a viable and profitable career path. A smaller percentage, represented by participant who responded ("Maybe") or did not see it as profitable ("No"). This data reflects a high level of confidence in the economic potential of livestock farming, suggesting that many young people recognize it as a sustainable and rewarding profession for the future.



The chart above reveals an overwhelmingly positive attitude among respondents towards youth involvement in modern livestock farming. 99.4% indicated that they would encourage other youth to engage in this sector, while only 0.6% responded negatively. This strong majority suggests a widespread recognition of the benefits and opportunities associated with modern livestock farming, highlighting its potential as a viable and appealing livelihood option for the younger generation. The data underscores the growing interest and support for innovative agricultural practices among youth.

Conclusion

Innovative agricultural practices offer a viable solution to youth unemployment and food insecurity in rural areas. By leveraging on precision livestock farming, hydroponic fodder systems, climate-smart techniques, and digital veterinary services, young people can transform animal production into a profitable and sustainable business. However, addressing challenges such as land accessibility, financing, and training is crucial. With the right policies and investments, rural youth can become key drivers of livestock sector transformation and economic development.

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