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Examining effectiveness of agriculture empoweremnt schemes: A case study of small scale dairly farmers in Monze

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Abstract
The aim of the study was to examine effectiveness of empowerment schemes in improving livelihoods. This is a case study of dairy farmers in Monze. Specific objectives were; to establish strategies used to improve dairy farming in improving livelihoods, to evaluate effectiveness of strategies used to dairy farmers in the projects and to establish challenges faced by women in dairy projects. A descriptive case study approach was adopted to match the nature of the topic. The study will use open ended questionnaires and guided oral interviews. A sample was drawn from farmers to generate inferences about the target population. This helps in saving time and resources it would otherwise have taken to meet every individual in the entire population. Target population in this research comprises of all those potential participants that could make up the study group. In this research, the target population was 50 dairy farmers are targeted. Non Random sampling of respondents was carried out. The respondents will be picked from various cooperatives involved in various dairy activities. This was done in order to extract correct and accurate information because the problem at hand required such consideration. In this study, the sample size of 50 respondents were picked. These respondents will be purposely chosen by the researcher Data collection consisted of interviews from the selected dairy farmers both male and female. For the qualitative data, the researcher used descriptive method, while for quantitative data will be analyzed using Microsoft Word and Excel to generate tables and other graphic illustrations. 52% (26 participants) believe that their livelihoods have improved due to the empowerment schemes.

Keywords: Farmer, dairy, income, livelihood, training

Introduction
It is estimated that almost 150 million farm households, i.e. more than 750 million people, are engaged in milk production worldwide, the majority of whom are in developing countries (FAO, 2010) [8]. Annual milk consumption growth rates in these countries averaged 3.5 to 4.0 percent over the decade 2005-2015, at least double the growth rates of 1.4 to 2.0 percent for major staple foods over the same period (FAO, 2020) [9]. The dairy sector provides income and employment to many, often poor, people. It is estimated that 12 to 14 percent of the world population, or 750-900 million people, live on dairy farms or within dairy farming households and the production of one million liters of milk per year on smallholder dairy farms creates approximately 200 on farm jobs (FAO, 2020) [9]. Smallholder dairy farming promotes regular monetary earnings to people who access cash once a season after they sell their harvested crops. The regular monthly monetary earnings from the sale of milk and milk products have favorable effects on the cash flow charts of rural households and assist in improving the lifestyles of the rural people. Smallholder dairying also helps people to get involved in the mainstream cash economy and poverty alleviation ventures of their countries. It increases the milk production base of the country, improves household nutrition, and empowers women and youths in income generation ventures and overall agricultural development. It assists farmers to diversify, spread farming risks and creates opportunity for some idling resources like crop residues to enter the human food chain hence utilizing marginal form of resources (Ngongoni *et al*., 2016) [15].

General objective

The aim of the study was to examine effectiveness of empowerment schemes in improving livelihoods. This is a case study of dairy farmers in Monze.

Specific Objectives

- To establish strategies used to improve dairy farming in improving livelihoods.
- To evaluate effectiveness of strategies used to dairy farmers in the projects.
- To establish challenges faced by women in dairy projects.

Theoretical frameworks

Recently, there has been a growing concern in the management literature over the actual doings of people involved in organizational phenomena. In this direction, the practice-based perspective overcomes the current problematic dualisms of traditional ways of thinking and offers a dynamic view to human interaction within different contexts. The call for a practice turn in social sciences has also influenced the strategy formation, implementation and change research domains (Whittington, 1996, 2006) [22-23]. As such it clearly differs from the application of theories in practice, or the assessment of practical significance of theories (sometimes the word practice is misleading). According to Schatzki (2001) [19], there is no unified practice approach, but among practice thinkers, some, including Bourdieu, have contributed with their work to the creation of a view of social phenomena free from the deterministic dualities of structure or agency, the individual or the social, and the objective or subjective world. Bourdieu's contribution has already been acknowledged in the strategy as practice literature (Gomez and Bouty, 2011) [10].

Significance of the study

The study will help policy makers, auxiliary government institutions, private sector players in the agriculture industry and small-scale farmers to effectively come up with interventions that will mitigate droughts effectively in Zambia. It is envisaged that there will be strong backward and forward linkages in the agricultural sector that will result from the provision of information. Ultimately, this will contribute effectively to the economic empowerment among small scale farmers especially women. 70% of Zambia's population depends on agriculture.

Literature Review

Strategies used in dairy projects in improving livelihoods

Many studies have been carried out to assess the viability or relative profitability of smallholder dairy farming and the critical factors affecting it. There is a rich history of researchers using gross margin analysis as a tool to determine efficiency and profitability of dairy systems, and regression analysis to determine factors affecting these systems (Cain *et al.*, 2007) [3]. Mburu *et al.* (2007) [14] carried out similar works to assess the profitability in different agro ecological zones in the Kenya highlands, but his study had limitations of valuation of manure and sale of calves as there was lack of accurate market prices for these secondary outputs. A study by Osotimehin *et al.* (2006) [16] examined the profitability as well as operational efficiency of milk processing enterprise in Kogi state, Nigeria using budgetary analysis. This resulted in the calculation of net farm income for processors hence omitting the profitability for dairy farmers. A study on the measurement of economic efficiency for smallholder dairy cattle in the marginal zones of Kenya by Kavoi *et al.* (2010) [13] preferred to use the cost function approach over the profit function approach to avoid problems of estimation that may arise in situations where farm households realize zero or negative profits at the prevailing market prices. Otieno *et al.* (2009) [17] carried out some work on economic evaluation of relative profitability in small holder dairy farms in western Kenya. He used farmers' profit levels generated by gross margin analysis in comparing their relative.

Effectiveness of strategies used by dairy farmers in the projects?

According to FAO report (2005) [7], a study conducted in Bangladesh on small scale dairy production. It reviewed that the support of dairy farming by FA O and other international grants on veterinary services improved milk yield by 30%, live weight gain by 12%), income increased by US$ 35 per household/ farmer. Farmers in Khutna-Satkhiva western region of Bangladesh used to produced 30000 liters of milk/ day, but no formal market were available and farmers were about to give up on dairy. FAO and IAEA organized them into associations and worked as pressure groups on the government and the government provided the producers with co-operative unions which were responsible for collection and marketing of milk and processing, this increased their incomes by 25%> and job creation by 30%o. 6 2.3 Dairy Production and Food Security and Employment Heifer international project report (2004) [11], contributed the most to their income generation. Huss-Ashmore (1992) [12], conducted an impact evaluation study of the project on small holder dairy farmers in Kenya, he found that standards of living in Coast province (Kenya) were high in areas where dairy production was done and living standards were very low in central highlands without dairy production. Dairy projects were initiated by National Dairy Development Projects in the Coast province and dairy brought nutritional and economic benefits through increased incomes and high accessibility to nutritious food stuffs. .More job opportunities were created in the coast highlands due to increased dairy activities. Studies in Kenya highlands have indicated that with increasing commercialization the control of income from milk sales shifted from women to men by 10%. Income accruing to women is more likely to be used to provide food for the households. FAO report (2004) [6], about the research conducted in

Challenges farmers face in dairy projects

Some factors are cross-cutting regardless of dairy production system and agro ecologies that can have influence on dairy production; others are system specific (Azage *et al.* 2013) [1]. There are a number of challenges which faced the dairy farm development. These include limited genetic resources, inadequate veterinary service provision, inadequate animal feed resources, poor management, reproductive challenges and market related challenges (Belachew and Jemberu 2002) [2]. The poor genetic potential for productive traits, low level of health care, substandard feeding and management practices are the main contributors to the low productivity of this sector (Zegeye 2003) [25].

Methodology

Research design

Research design is defined as the general plan of how the researcher goes about answering the research questions Saunders *et al*. (2007) [18]. A descriptive case study approach will be adopted to match the nature of the topic.

Target population

According to Shajahan (2004) [20] the term population refers to the set of all elements of interest in a particular study. Target population in this research comprises of all those potential participants that could make up the study group. In this research, the target population was 50 dairy farmers are targeted.

Sampling design

Random sampling of respondents will be carried out. The respondents will be picked from various cooperatives involved in various dairy activities. This will be done in order to extract correct and accurate information because the problem at hand required such consideration.

Sample Size determination

The basic idea of sampling is by selecting some of the elements in a population, we may draw conclusions about the entire population [Cooper and Schindler (2001)] [4]. The reason why sampling is necessary is because of lower costs, greater accuracy of results, and greater speed of data collection and availability of population elements.

Data collection methods

The main instruments to be used are questionnaires and personal interviews. The questionnaires will comprise closed and open ended questions. Questionnaires will either be administered or handed out to the respondents depending on their business operating schedules. Qualitative and quantitative data analysis will be done. Quantitative data will be used because it is easier to present using tables and qualitative data helped express the data collected.

Data Analysis

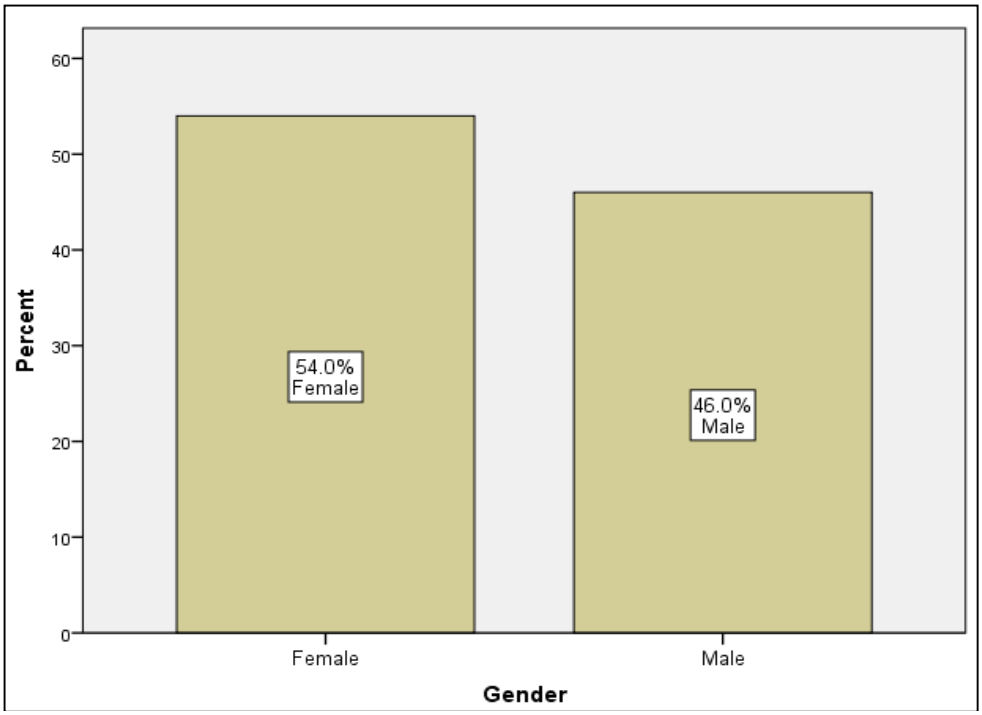
Data analysis is the process of editing and reducing accumulated data to a manageable size, developing summaries, looking for patterns and applying statistical techniques [Cooper and Schindler (2008) [5]. The data collected will be analyzed using tables, figures. The researcher used both qualitative and quantitative method.
For the qualitative data, the researcher used descriptive method, while for quantitative data will be analyzed using Microsoft Word and Excel to generate tables and other graphic illustrations.

Ethical Considerations

The researcher will ensure that no respondents are forced to give information concerning the subject matter but allowed them to give information out of their own convenience and free will. The researcher will also ensure the information obtained from respondents remain confidential, and that information obtained is purely for academic purposes.

Data Presentation and Discussions

Demographics



The bar graph presents the gender distribution of the participants involved in the study. It shows that 54% of the participants are female, while 46% are male. This nearly balanced representation indicates that both women and men are actively engaged in dairy farming and are beneficiaries of the agriculture empowerment schemes. The slight majority of female participants highlights the significant role that women play in the dairy farming sector and underscores the importance of addressing gender-specific challenges and opportunities within the empowerment schemes.

Thematic area 1, To establish strategies used to improve dairy farming in improving livelihoods

Primary Dairy Farming Strategies Adopted

Table 1: Primary strategies used by small-scale dairy farmers in Monze to improve productivity

Strategy Adopted					
	Frequency		Percent	Valid Percent	Cumulative Percent
Valid	Artificial Insemination	6	12.0	12.0	12.0
	Improved Breeds	11	22.0	22.0	34.0
	Improved Feeding Practices	11	22.0	22.0	56.0
	Milk Preservation Techniques	12	24.0	24.0	80.0
	Veterinary Services	10	20.0	20.0	100.0
	Total	50	100.0	100.0	

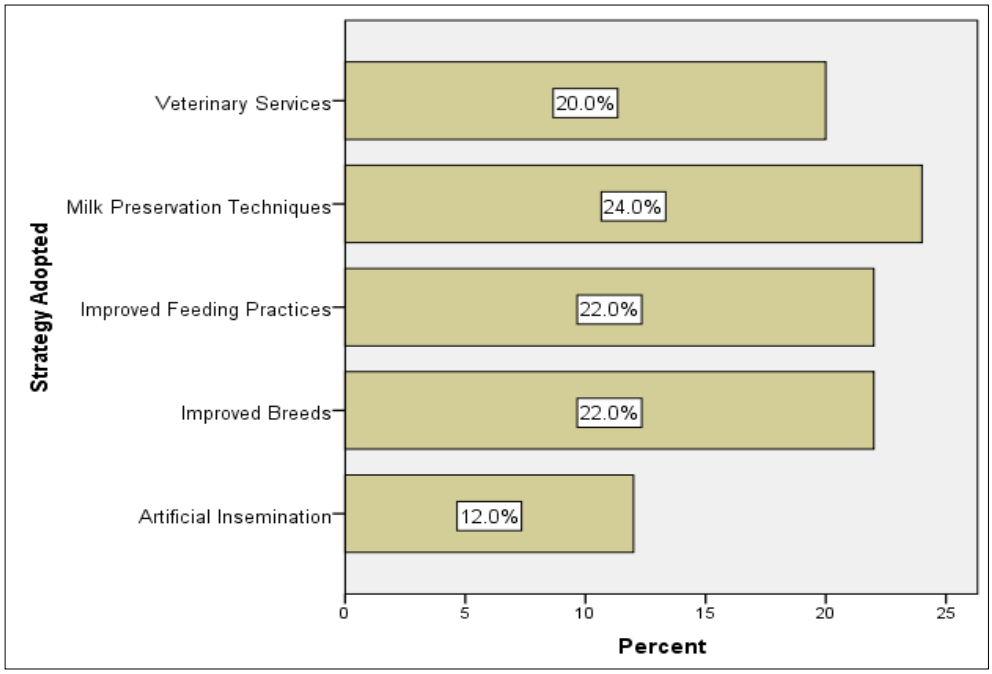


Fig 1: Adopted strategies

The bar graph presents the primary strategies adopted by small-scale dairy farmers in Monze to enhance their dairy farming practices. Veterinary Services (20%): A significant portion of farmers invest in veterinary services, underscoring the importance of maintaining animal health and preventing diseases to ensure consistent milk production.

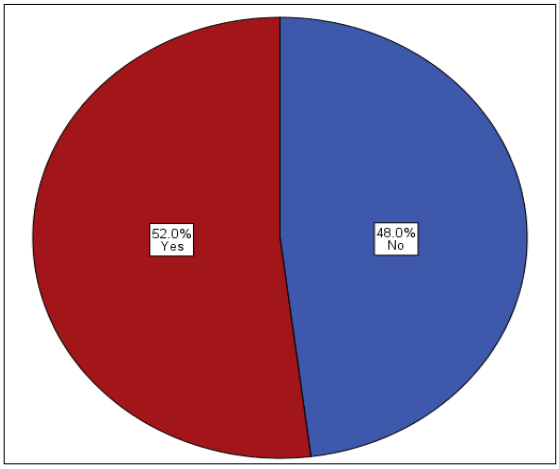


Fig 2: Livelihood Improvement Perception

The pie chart presents the participants' perceptions of livelihood improvement resulting from agriculture empowerment schemes. Out of 50 respondents. 52% (26 participants) believe that their livelihoods have improved due to the empowerment schemes. This majority perception indicates that more than half of the small-scale dairy farmers feel positively impacted by the initiatives, suggesting significant benefits such as increased income, better farming practices, and improved quality of life.This distribution reveals a nearly balanced view among the participants, with a slight majority acknowledging improvements. The close percentage points to the necessity of ongoing assessment and potential adjustments to the empowerment schemes to maximize their effectiveness and reach all intended beneficiaries.

Table 2: Cross tabulation of strategy adopted and livelihood improvement perception

Strategy Adopted and Livelihood Improvement Perception Cross tabulation					
			Livelihood Improvement Perception		Total
			No	Yes	
Strategy Adopted	Artificial Insemination	Count	5	1	6
		Expected Count	2.9	3.1	6.0
	Improved Breeds	Count	4	7	11
		Expected Count	5.3	5.7	11.0
	Improved Feeding Practices	Count	5	6	11
		Expected Count	5.3	5.7	11.0
	Milk Preservation Techniques	Count	5	7	12
		Expected Count	5.8	6.2	12.0
	Veterinary Services	Count	5	5	10
		Expected Count	4.8	5.2	10.0
Total		Count	24	26	50
		Expected Count	24.0	26.0	50.0

Chi-Square Tests			
	Value	DF	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.835[a]	4	.429
Likelihood Ratio	4.086	4	.395
N of Valid Cases	50		
a. 3 cells (30.0%) have expected count less than 5. The minimum expected count is 2.88.			

Interpretation

The analysis indicates that while some strategies like improved breeds and milk preservation techniques show a positive perception of improving livelihoods, the overall chi-square results suggest no significant relationship between the strategies adopted and the perception of livelihood improvement. This implies that other factors might also play a crucial role in influencing the perceived improvement in livelihoods among small-scale dairy farmers in Monze.

Thematic area 2 to evaluate effectiveness of strategies used to dairy farmers in the projects

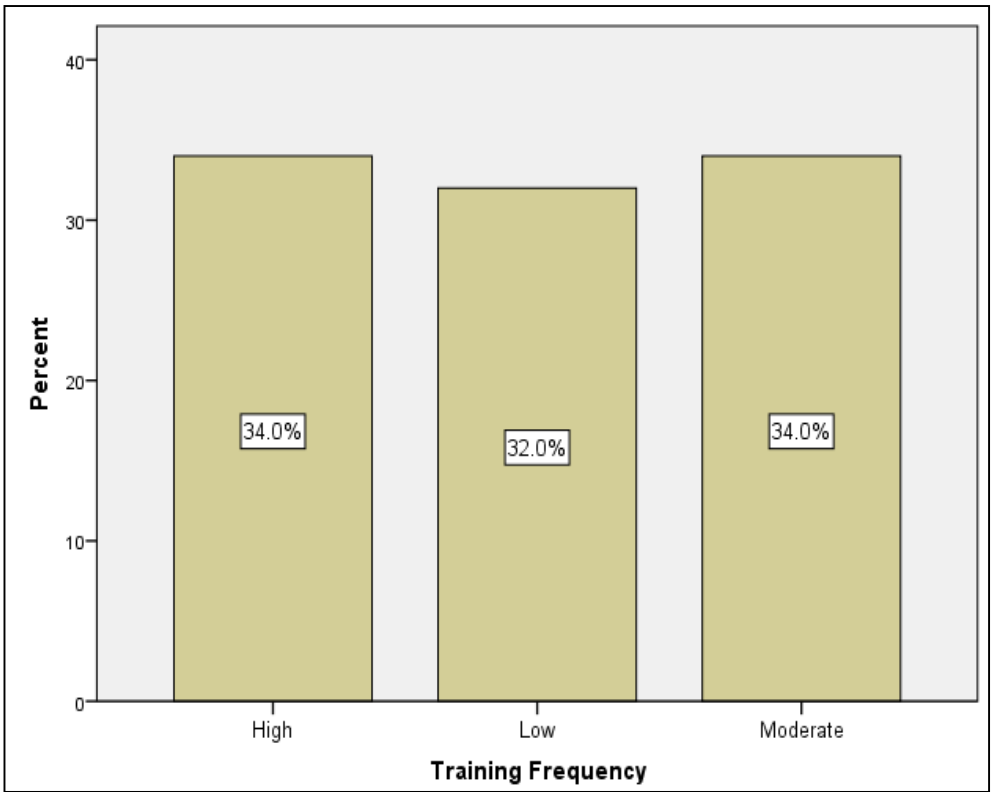


Fig 4: Training frequency and perceived effectiveness

The bar graph presents the distribution of training frequency among small-scale dairy farmers in Monze.

34% of the participants report a high frequency of training. This indicates that over a third of the farmers are receiving regular and comprehensive training sessions, which are crucial for enhancing their skills and knowledge in dairy farming practices.

34%of the participants report a moderate frequency of training. This suggests that another third of the farmers are engaged in training sessions at a moderate level, benefiting from occasional but not as frequent training opportunities.

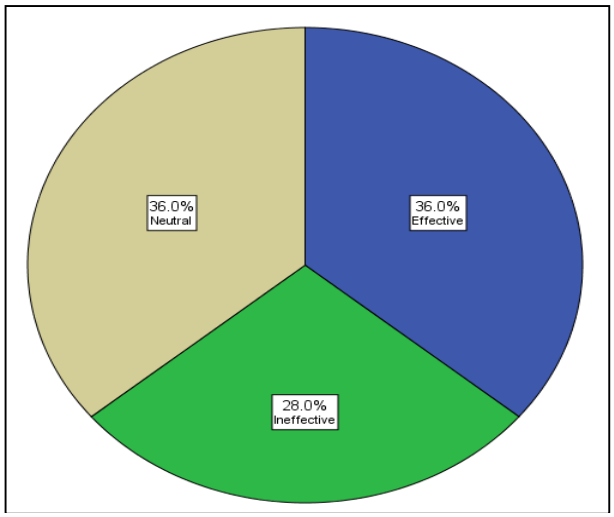


Fig 5: Perceived Effectiveness

The pie chart depicts the perceived effectiveness of the agriculture empowerment schemes from the perspective of the small-scale dairy farmers in Monze. The data shows:

36% of participants believe the schemes are effective. This indicates that over a third of the farmers perceive the initiatives as successfully improving their dairy farming practices and overall livelihoods.

36% of participants hold a neutral view on the effectiveness. This suggests that another third of the farmers neither see significant positive outcomes nor clear negative impacts, indicating a mixed perception and possibly a wait-and-see approach regarding the long-term benefits of the schemes.

28% of participants view the schemes as ineffective. This group, representing slightly more than a quarter of the respondents, feels that the initiatives have not delivered the expected improvements or have failed to address their specific needs and challenges.

This distribution highlights a relatively balanced view among the farmers, with the majority split between those who find the schemes effective or neutral in impact. The presence of a significant minority perceiving ineffectiveness suggests the need for ongoing evaluation and adjustment of the empowerment strategies to better align with the farmers' expectations and address any gaps in their implementation.

Table 4: Resource allocation and dairy output improvement

Resource Allocation and Dairy Output Improvement Cross tabulation					
			Dairy Output Improvement		Total
			No	Yes	
Resource Allocation	Adequate	Count	0	20	20
		Expected Count	6.0	14.0	20.0
	Inadequate	Count	15	0	15
		Expected Count	4.5	10.5	15.0
	More than Adequate	Count	0	15	15
		Expected Count	4.5	10.5	15.0
Total		Count	15	35	50
		Expected Count	15.0	35.0	50.0

Table 5: Show chi-square tests and the minimum expected count is 4.50

Chi-Square Tests			
	Value	DF	Asymp. Sig. (2-sided)
Pearson Chi-Square	50.000[a]	2	.000
Likelihood Ratio	61.086	2	.000
N of Valid Cases	50		
a. 2 cells (33.3%) have expected count less than 5, The minimum expected count is 4.50.			

Interpretation

The chi-square test results show a Pearson Chi-Square value of 50.000 with a p-value of 0.000. Since the p-value is less than the standard significance level of 0.05, we reject the null hypothesis. This indicates a highly significant relationship between resource allocation and dairy output improvement among the participants.

The analysis highlights a highly significant relationship between resource allocation and perceived improvement in dairy output. Participants with adequate or more than adequate resource allocation consistently perceive improvements in their dairy output, whereas those with inadequate resource allocation do not perceive any improvement. This underscores the critical importance of sufficient resource allocation in enhancing dairy farming outcomes and livelihoods among small-scale dairy farmers in Monze.

Thematic area 3 to establish challenges faced by women in dairy projects

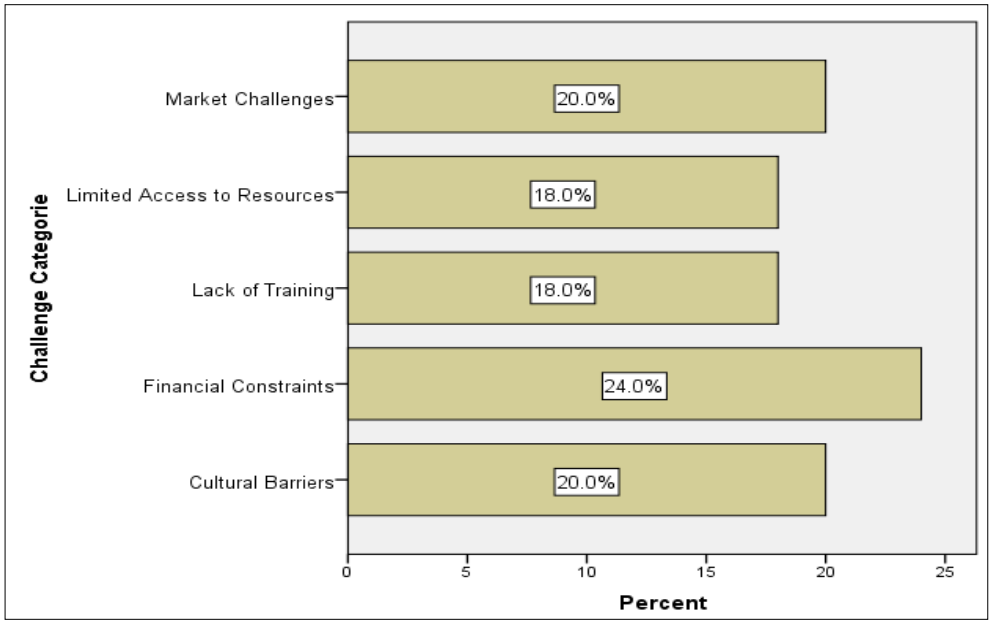


Fig 7: challenges faced by women in dairy projects

The bar graph highlights the various challenges encountered by women participating in dairy projects. The data reveals the following distribution of challenges:

Financial Constraints (24%): This is the most significant challenge, indicating that nearly a quarter of the women struggle with securing adequate financial resources to support their dairy farming activities. This issue impacts their ability to invest in essential inputs and infrastructure, limiting their potential for growth and productivity.

This distribution underscores the multifaceted nature of the barriers faced by women in dairy projects. Addressing these challenges through targeted interventions such as financial support, training programs, resource accessibility, and cultural sensitization can significantly enhance the effectiveness of agriculture empowerment schemes and support the sustainable growth of women-led dairy enterprises.

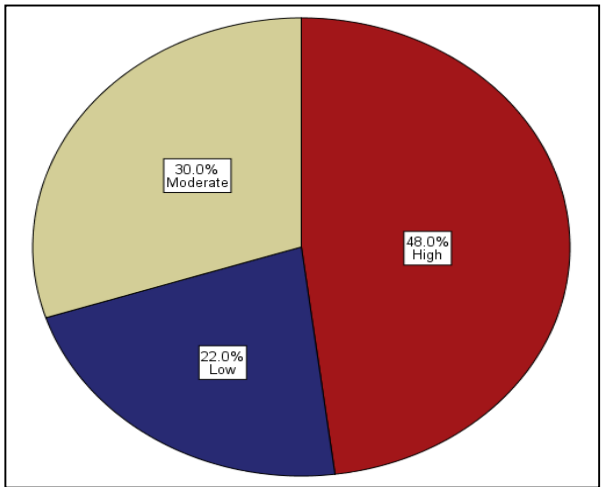


Fig 8: Perceived impact on dairy projects

The pie chart depicts the participants' perceptions of the impact of agriculture empowerment schemes on dairy projects. Out of 50 respondents:

48% perceive a high impact. This indicates that nearly half of the small-scale dairy farmers believe that the empowerment schemes have significantly improved their dairy farming operations, leading to better productivity, income, and overall success.

30% perceive a moderate impact. This suggests that a significant portion of the farmers acknowledge some positive changes brought about by the schemes, although the improvements may not be as pronounced or widespread.

22% perceive a low impact. This group of farmers feels that the empowerment schemes have had minimal effect on their dairy farming activities, indicating that the initiatives may not be addressing all of their challenges or needs effectively.

This distribution highlights a generally positive perception of the empowerment schemes, with the majority of participants recognizing high to moderate benefits. However, the presence of participants who perceive a low impact suggests areas for improvement and further engagement to ensure that all farmers can fully benefit from the empowerment initiatives.

Cross tabulation of challenge category and perceived impact: The cross tabulation data indicates the distribution of perceived impact based on various challenges faced by women in dairy projects

Table 10: Challenge category and perceived effect cross tabulation

			Perceived effect			Total
			High	Low	Moderate	
Challenge Category	Cultural Barriers	Count	0	10	0	10
		Expected Count	4.8	2.2	3.0	10.0
	Financial Constraints	Count	9	0	3	12
		Expected Count	5.8	2.6	3.6	12.0
	Lack of Training	Count	3	0	6	9
		Expected Count	4.3	2.0	2.7	9.0
	Limited Access to Resources	Count	6	0	3	9
		Expected Count	4.3	2.0	2.7	9.0
	Market Challenges	Count	6	1	3	10
		Expected Count	4.8	2.2	3.0	10.0
Total		Count	24	11	15	50
		Expected Count	24.0	11.0	15.0	50.0

Table 8

Chi-Square Tests			
	Value	DF	Asymp. Sig. (2-sided)
Pearson Chi-Square	50.055[a]	8	.000
Likelihood Ratio	50.291	8	.000
N of Valid Cases	50		
a. 14 cells (93.3%) have expected count less than 5. The minimum expected count is 1.98.			

Interpretation

The chi-square test results show a Pearson Chi-Square value of 50.055 with a p-value of 0.000. Since the p-value is less than the standard significance level of 0.05, we reject the null hypothesis. This indicates a highly significant relationship between the challenge categories and the perceived impact on dairy projects among the participants.

The analysis highlights a highly significant relationship between the challenges faced by women in dairy projects and their perceived impact. Cultural barriers are predominantly associated with low perceived impact, indicating that these barriers significantly hinder the effectiveness of dairy projects.

Discussions

Demographics

The bar graph presents the gender distribution of the participants involved in the study. It shows that 54% of the participants are female, while 46% are male. This nearly balanced representation indicates that both women and men are actively engaged in dairy farming and are beneficiaries of the agriculture empowerment schemes. The slight majority of female participants highlights the significant role that women play in the dairy farming sector and underscores the importance of addressing gender-specific challenges and opportunities within the empowerment schemes.

Thematic area 1 to establish strategies used to improve dairy farming in improving livelihoods

Table 1: Primary strategies used by small-scale dairy farmers in Monze to improve productivity

Strategy Adopted					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Artificial Insemination	6	12.0	12.0	12.0
	Improved Breeds	11	22.0	22.0	34.0
	Improved Feeding Practices	11	22.0	22.0	56.0
	Milk Preservation Techniques	12	24.0	24.0	80.0
	Veterinary Services	10	20.0	20.0	100.0
	Total	50	100.0	100.0	

The bar graph presents the primary strategies adopted by small-scale dairy farmers in Monze to enhance their dairy farming practices.

- **Milk Preservation Techniques (24%):** This is the most adopted strategy among the farmers, highlighting the importance placed on preserving milk quality and extending its shelf life to maximize returns.
- **Improved Breeds (22%) and Improved Feeding Practices (22%):** These two strategies are equally prioritized, indicating a focus on genetic improvement of the herd and better nutrition to increase milk production and overall herd health.
- **Veterinary Services (20%):** A significant portion of farmers invest in veterinary services, underscoring the importance of maintaining animal health and preventing diseases to ensure consistent milk production.
- **Artificial Insemination (12%):** This strategy, while less adopted compared to others, reflects a targeted approach to genetic improvement, allowing farmers to select for desirable traits and enhance herd productivity.

Livelihood Improvement Perception

The pie chart presents the participants' perceptions of livelihood improvement resulting from agriculture empowerment schemes. Out of 50 respondents:

52% (26 participants) believe that their livelihoods have improved due to the empowerment schemes. This majority perception indicates that more than half of the small-scale dairy farmers feel positively impacted by the initiatives, suggesting significant benefits such as increased income, better farming practices, and improved quality of life.

48% (24 participants) do not perceive a noticeable improvement in their livelihoods. This substantial minority highlights that nearly half of the respondents have not experienced the expected benefits, indicating areas where the schemes may need to be reviewed, refined, or better communicated to ensure more consistent positive outcomes.
This distribution reveals a nearly balanced view among the participants, with a slight majority acknowledging improvement. The close percentage points to the necessity of ongoing assessment and potential adjustments to the empowerment schemes to maximize their effectiveness and reach all intended beneficiaries
Cross tabulation of Strategy Adopted and Livelihood Improvement Perception

Interpretation
The chi-square test results show a Pearson chi-square value of 3.835 with a p-value of 0.429. Since the p-value is greater than the standard significance level of 0.05, we fail to reject the null hypothesis. This indicates that there is no statistically significant relationship between the strategies adopted and the perception of livelihood improvement among the participants.
Around 15 youths get employed directly and indirectly after every 100 liters of milk produced and marketed, indicating that dairy is a good employment opportunity in the rural setup of Zambia.
Another promising development is that a number of women farmers and female-headed households work fulltime in smallholder dairy business and perform better than their male counterparts. Women are the most likely agents of change, and when women and girls earn income, they reinvest 80-9.

Thematic area 2 to evaluate effectiveness of strategies used to dairy farmers in the projects
The bar graph presents the distribution of training frequency among small-scale dairy farmers in Monze.
34% of the participants report a high frequency of training. This indicates that over a third of the farmers are receiving regular and comprehensive training sessions, which are crucial for enhancing their skills and knowledge in dairy farming practices.
34%of the participants report a moderate frequency of training. This suggests that another third of the farmers are engaged in training sessions at a moderate level, benefiting from occasional but not as frequent training opportunities.
32% of the participants report a low frequency of training. This implies that nearly a third of the farmers have limited access to training sessions, which might affect their ability to fully adopt and implement improved farming practices.
This distribution reveals that while a significant portion of the farmers are benefiting from high and moderate training frequencies; there is still a substantial group with limited training exposure. Addressing this gap by increasing training opportunities for all farmers is essential to ensure the consistent and effective implementation of agricultural empowerment schemes.
The pie chart depicts the perceived effectiveness of the agriculture empowerment schemes from the perspective of the small-scale dairy farmers in Monze. The data shows:
36% of participants believe the schemes are effective. This indicates that over a third of the farmers perceive the initiatives as successfully improving their dairy farming practices and overall livelihoods.
28% of participants view the schemes as ineffective. This group, representing slightly more than a quarter of the respondents, feels that the initiatives have not delivered the expected improvements or have failed to address their specific needs and challenges.
This distribution highlights a relatively balanced view among the farmers, with the majority split between those who find the schemes effective or neutral in impact. The presence of a significant minority perceiving ineffectiveness suggests the need for ongoing evaluation and adjustment of the empowerment strategies to better align with the farmers' expectations and address any gaps in their implementation.

Thematic area 3 to establish challenges faced by women in dairy projects
Perceived impact on dairy projects
The pie chart depicts the participants' perceptions of the impact of agriculture empowerment schemes on dairy projects. Out of 50 respondents:
48% perceive a high impact. This indicates that nearly half of the small-scale dairy farmers believe that the empowerment schemes have significantly improved their dairy farming operations, leading to better productivity, income, and overall success.
30% perceive a moderate impact. This suggests that a significant portion of the farmers acknowledge some positive changes brought about by the schemes, although the improvements may not be as pronounced or widespread.
22% perceive a low impact. This group of farmers feels that the empowerment schemes have had minimal effect on their dairy farming activities, indicating that the initiatives may not be addressing all of their challenges or needs effectively.
This distribution highlights a generally positive perception of the empowerment schemes, with the majority of participants recognizing high to moderate benefits. However, the presence of participants who perceive a low impact suggests areas for improvement and further engagement to ensure that all farmers can fully benefit from the empowerment initiatives. A great potential The total annual production of milk in the country is estimated to be about 300 million liters, with 25 per cent supplied by commercial farmers, 13 per cent by smallholder farmers and 62 per cent by traditional cattle keepers. Of this, only 95 million liters is processed, and the rest remains in the informal market and for home consumption. An attempt was started in late 2013 and 2014 to commercialize the potential availability of milk from the untapped traditional cattle keepers to mop the milk into the formal market by establishing 16 milk bulking points in Southern, Lusaka and Central Provinces. It is estimated that the traditional sector alone from 15 districts of Zambia having major cattle populations in Southern, Central and Western Provinces could contribute up to about 57.5 million liters of milk per year to the formal market if market development and infrastructure were to take place in the above traditional cattle rearing areas and they were linked with processors.

Conclusions and Recommendations
Conclusion
Cattle in sub-Saharan Africa are either held in free grazing, semi-grazing or zero grazing systems. In free grazing systems, cattle graze without any supplementing feed. In

zero grazing, cattle are fed and kept in a confined space. Semi-grazing systems are a combination of free and zero grazing systems with grazing during daytime, and supplementing feeding in a confined space at a night. Free or semi-grazing systems are mostly used by small scale farmers, especially by those of lower wealth class (Rufino *et al*., 2007). In semi-grazing systems, supplementing feed may be given and mainly consists of grass, hay (Rufino *et al*., 2007) and other crop residues available on the farm such as maize Stover's, cowpea straw and soya bean straw. Concentrates given are for example maize bran, molasses (mixed with other feed), sunflower seed cake and cottonseed cake. These are often expensive and therefore inconsistently used, so protein and energy levels in the feed are often too low for lactating cows because it is difficult to cover energy and protein requirements with grazing only

Recommendations

Specific policy themes could have a major positive impact on smallholder dairying cost structure and profitability in future, particularly in the presence of seasonal intra-year variations in production. These include creation of a strategic milk reserve to absorb excess milk during high production periods and stabilize milk production shortfalls in the dry season investment in processing of long life dairy products to absorb excess production and expand to non-traditional markets; investment in infrastructure (roads, collection points, cooling plants and electricity) to ease milk collection and processing and, speedy implementation of the national livestock feed policy to guide and promote on farm feed preservation.

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