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Effect of Income Diversification Financial Resilience among Pastoralists in Borana Community, Southern Ethiopia

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ABSTRACT

Purpose: To assess the Effect of Income Diversification Financial Resilience among Pastoralists in Borana Community, Southern Ethiopia

Methodology: Using a descriptive research design, a sample of 394 respondents was selected via simple random sampling, based on Yamane's formula. Data were collected through structured questionnaires and validated with a pilot study (Cronbach's alpha ≥ 0.7). SPSS Version 25 facilitated analysis through descriptive statistics and multiple regression, assessing the effects of risk management, income diversification, asset preservation, and economic empowerment on financial resilience. Results were clearly presented in tables.

Results: The study found a moderate positive relationship ($R = 0.432$) between income diversification and financial resilience among Borana pastoralists in Southern Ethiopia. Income diversification explained 18.7% of the variance in financial resilience ($R^2 = 0.187$; adjusted $R^2 = 0.183$). A one-unit increase in diversification led to a 0.507-unit rise in resilience ($B = 0.507$), with strong statistical significance ($t = 4.671$, $p = 0.000$; $F = 25.874$, $p < 0.05$). These results confirm income diversification as a key predictor of financial resilience, aligning with prior research highlighting its importance in enhancing pastoralists' adaptive capacity against climate risks.

Unique contribution to theory, policy, and practice: This study highlights how income diversification strengthens financial resilience among pastoralist communities in Ethiopia's Borana Zone. Engaging in trade, crop farming, wage labor, and small enterprises enhances adaptive capacity to climatic and economic shocks. It advances resilience theory by showing that diversified income streams are vital for sustainable livelihoods in vulnerable ecosystems. The research urges policymakers and development actors to prioritize livelihood diversification through vocational training, financial literacy, microfinance, and improved market access. Promoting alternative income sources reduces overreliance on livestock, mitigating the impacts of drought and market instability while fostering secure, adaptive rural livelihoods.

Keywords: *Income Diversification, Financial Resilience, Pastoralists, Borana Community*

1.1 INTRODUCTION

Financial resilience is a critical factor in ensuring the long-term sustainability of livelihoods, especially in regions affected by recurrent climate shocks. Among pastoralist communities in the Borana Zone of southern Ethiopia, livestock remains the dominant source of income, food, and cultural identity. However, increasing climate variability and frequent droughts have exposed these communities to heightened economic vulnerability, threatening their ability to maintain stable livelihoods and recover from shocks. As a result, building financial resilience has become a key focus for both policymakers and development practitioners aiming to support the adaptive capacity of these communities.

Income diversification plays a central role in promoting financial resilience. This involves expanding livelihood options beyond traditional livestock-based activities to include crop farming, trade, wage employment, and small-scale enterprises. Diversified income sources reduce overdependence on livestock, mitigate financial risks, and enhance household stability during periods of environmental or market-related disruptions. According to Hailu et al. (2020), income diversification not only improves the financial security of pastoralists but also encourages investment in productive activities that contribute to long-term economic sustainability. In fragile ecosystems like Borana, where livestock loss can result in severe economic hardship, having alternative income sources serves as a buffer that supports faster recovery and greater resilience.

The concept of income diversification aligns with resilience theory, which emphasizes the importance of flexibility and adaptability in responding to external stressors. In pastoralist settings, diversified income strategies promote self-reliance and enable households to better cope with uncertainty. As noted by Gebremedhin (2021), diversified livelihoods enhance resource allocation and reduce the likelihood of complete economic collapse in the face of climatic shocks.

In Ethiopia, national development strategies increasingly acknowledge the role of income diversification in poverty reduction and rural development. Programs aimed at promoting entrepreneurship, vocational training, and market access are being implemented to empower rural populations with skills and opportunities beyond traditional livestock rearing. For Borana pastoralists, such initiatives are particularly vital, given their high exposure to climate risks and limited access to formal safety nets. By strengthening economic options and reducing vulnerability, income diversification becomes a strategic pathway to resilience.

This study, therefore, seeks to examine the effect of income diversification on financial resilience among pastoralists in the Borana community. It aims to assess how different livelihood activities contribute to household stability and recovery capacity in the face of recurring droughts and market disruptions. By focusing on income diversification as a core component of financial resilience, the study provides practical insights into sustainable livelihood strategies that can inform policy and development interventions in climate-vulnerable pastoralist regions of Ethiopia.

1.2 Statement of the Problem

Financial resilience is crucial for the sustainability of pastoralist livelihoods, particularly in drought-prone regions such as the Borana Zone in southern Ethiopia. Traditionally, pastoralists in this region rely heavily on livestock as their primary source of income, food, and social status. However, increasing climate variability, recurrent droughts, and market disruptions have significantly weakened their ability to maintain economic stability and recover from shocks. Global and regional studies have shown that income diversification through supplementary activities such as crop farming, trade, wage labor, and small-scale enterprises can significantly improve household resilience. For instance, Hailu et al. (2020) found that households with diversified incomes had a 28% higher probability of recovering from drought-related shocks. Similarly, Gebremedhin (2021) noted that diversified income streams reduced the risk of total asset loss by 35% among pastoral households in drought-affected areas.

Despite this growing evidence, income diversification among pastoralists in Borana remains limited and underutilized. Research by Tache (2022) indicates that over 70% of Borana households still rely exclusively on livestock, making them highly vulnerable to external shocks. The barriers to diversification include limited access to training, market opportunities, credit facilities, and enabling infrastructure. As a result, many households face recurring cycles of asset depletion, food insecurity, and prolonged recovery periods after drought events. This persistent vulnerability undermines not only household welfare but also broader regional development goals.

Therefore, it is imperative to examine how income diversification affects the financial resilience of pastoralists in Borana. This study seeks to identify the extent to which diversified livelihood strategies contribute to stability and adaptability, and to propose practical measures that can enhance access to income opportunities, reduce risk, and promote sustainable development in the region.

1.3 Purpose of the Study

To assess the Effect of Income Diversification Financial Resilience among Pastoralists in Borana Community, Southern Ethiopia

1.4 Hypothesis

$H_0$1: Income diversification has no significant effect on Financial Resilience among Pastoralists in Borana Community, Southern Ethiopia

2.0 LITERATURE REVIEW

2.1 Theoretical Review

Modern Portfolio Theory (MPT), developed by Harry Markowitz in the 1950s, serves as the theoretical foundation for examining income diversification and financial resilience among pastoralist communities. MPT posits that diversification across a range of assets with varying

levels of risk and return reduces the overall risk of an investment portfolio while maximizing potential returns. The central idea is that combining different income sources especially those with low or negative correlations can protect against the failure of any single income stream, thereby enhancing economic stability (Bodie et al., 2024).

In the context of pastoralist livelihoods, income diversification mirrors the principles of MPT by encouraging households to engage in various income-generating activities beyond livestock rearing, such as crop production, trade, or wage labor. This spread of income sources helps reduce financial vulnerability during climatic or market shocks and supports long-term livelihood sustainability. Lence et al. (2019) highlight that, much like a diversified financial portfolio, diversified livelihoods among pastoralists lower the likelihood of complete economic collapse during droughts or livestock losses.

Further applications of MPT in this context underscore the importance of understanding the correlations between different livelihood activities to manage risks effectively. As Elton et al. (2021) explain, diversifying across uncorrelated or counter-cyclical income streams can significantly improve household resilience and reduce reliance on a single economic asset, such as livestock.

Despite its relevance, MPT has been criticized for relying heavily on assumptions such as market efficiency, rational decision-making, and historical data, which may not align with the dynamic and informal nature of pastoralist economies. Scholars like Fama and French (2022) and Black (2022) argue that MPT fails to account for behavioral factors and extreme risks such as prolonged droughts or conflict that often disrupt traditional pastoral systems. Furthermore, the theory's static, mean-variance optimization model may not fully accommodate the adaptive strategies employed by pastoralists in real-world contexts (Fratkin, 2020).

Nonetheless, MPT remains a useful framework for understanding how diversified income strategies can serve as risk management tools. This study applies MPT to assess how income diversification contributes to the financial resilience of pastoralists in Borana, recognizing that a broader mix of income sources can reduce vulnerability, promote stability, and enhance adaptive capacity in unpredictable environments.

2.2 Empirical Review

Income diversification plays a critical role in enhancing financial resilience among pastoralist communities, especially in drought-prone regions such as Borana, Southern Ethiopia. Diversified income sources reduce dependence on livestock, mitigate risk, and provide households with alternative coping strategies during periods of environmental and economic shocks. Numerous empirical studies support the positive impact of income diversification on resilience, adaptation, and household stability.

Catley et al. (2021) demonstrated that pastoralists in the Horn of Africa with diversified income streams were better equipped to manage droughts and other external shocks, highlighting the necessity of integrating income diversification into long-term development strategies. Similarly, Goodwin and Mahul (2020) found that Mongolian pastoral households with varied incomes proactively invested in sustainable practices such as water conservation and pasture management, thereby increasing their adaptive capacity. Galvin et al. (2022), in a study on the Maasai in Kenya, noted that income diversification significantly improved food security during periods of scarcity, reinforcing its importance for both economic and nutritional resilience.

In the East African context, little et al. (2021) found that diversified income helped buffer households from market instabilities and climatic extremes. Research by Homann-Kee Tui et al. (2019) specifically among Borana pastoralists in Ethiopia emphasized that those with multiple income sources were more resilient to livestock disease and drought. Likewise, Fratkin (2020) observed that diversified Turkana households reduced reliance on migration as a coping strategy, instead focusing on locally grounded income alternatives. Hodgson (2019) highlighted income-generating activities' role in enhancing women's financial autonomy among Maasai communities, contributing to broader household resilience.

Additional research supports these findings. Hesse (2020) identified improved access to healthcare and education among Nigerian Fulani pastoralists with stable, diversified incomes. Gichuki and Mwangi (2021) showed that income diversification helped maintain social cohesion in Kenya's Samburu communities during economic downturns. Roth (2022) noted Mongolian herders with stable incomes participated more in community-based land management, supporting environmental sustainability. McCabe (2023) revealed that diversification reduced seasonal migration pressures for Fulani and Turkana herders, respectively. Mude (2021) also demonstrated that diversified Tanzanian agro-pastoralist households achieved higher food security during lean seasons.

Overall, the empirical literature underscores income diversification as essential for building financial resilience among pastoralist communities. Whether through improved food security, reduced migration, or enhanced access to services, diversified income strategies empower pastoralists to withstand shocks, sustain livelihoods, and adapt to changing environments. These findings affirm the need for development interventions that promote diverse livelihood options tailored to the socio-economic and ecological contexts of pastoralist regions like Borana.

3.0 RESEARCH METHODOLOGY

This study was conducted in the Borana Zone, Southern Ethiopia, a region prone to climatic shocks such as droughts that severely impact pastoralist livelihoods. A descriptive research design was employed to examine the influence of income diversification on financial resilience among pastoralist communities. This design allowed for the collection of both quantitative and qualitative data in a natural setting, providing a clear understanding of the variables as they occurred.

The target population consisted of 24,560 pastoralists enrolled in the Index-Based Livestock Insurance (IBLI) program across five districts: Yabello, Miyo, Dhas, Arero, and Dirre. A simple random sampling technique was applied, giving all participants an equal chance of selection. Using the Yamane (1967) formula with a 95% confidence level and 5% margin of error, a sample size of 394 respondents was determined and proportionally distributed across the districts.

Data was collected through self-administered structured questionnaires aligned with the study objectives. To ensure reliability, a pilot test involving 10% of the sample was conducted in a similar pastoralist community in Northern Kenya. Cronbach's alpha was used to assess internal consistency, with a minimum acceptable value of 0.7. Construct, content, and face validity were confirmed through expert evaluation and pre-testing.

Data analysis was performed using SPSS version 25. Descriptive statistics such as frequencies and percentages were used alongside multiple regression analysis to test the relationship between income diversification and financial resilience. Diagnostic tests; including normality, linearity, multicollinearity, heteroscedasticity, and autocorrelation were conducted to ensure the validity of the regression model. Results were presented in tables for clarity. Ethical standards, including voluntary participation, confidentiality, and academic integrity, were strictly maintained throughout the study.

4.0 RESULTS

4.1 Reliability Analysis

A pilot test was conducted to evaluate the suitability and internal consistency of the research instruments in measuring the effect of income diversification on financial resilience among pastoralist communities in the Borana Zone, Southern Ethiopia. The reliability of the questionnaires was assessed using Cronbach's Alpha Coefficient, with all constructs recording alpha values above the acceptable threshold of 0.7. According to Peterson and Wooldridge (2019), a Cronbach's Alpha value of 0.7 or higher indicates that the research instruments are reliable and appropriate for social science research. As shown in Table 1, the instrument for income diversification achieved a Cronbach's Alpha of 0.812, confirming its strong internal consistency and effectiveness in capturing the intended variables. This validates the questionnaire's suitability for exploring how diversified income sources contribute to financial resilience in climate-vulnerable pastoralist communities.

Table 1: Reliability Test Instrument

Instrument	Cronbach's Alpha	N of Items
Income Diversification	0.812	6

These results confirm that the instrument used to assess income diversification was reliable for use in the study and well-aligned with the objective of evaluating its influence on financial resilience.

4.2 Response Rate

A sample size of 394 respondents was selected from pastoralist communities enrolled in the Index-Based Livestock Insurance (IBLI) program across five districts in the Borana Zone. Of these, 372 respondents returned the questionnaires, resulting in a response rate of 94.41%. According to Osgood et al. (2022), a response rate of 50% is generally considered acceptable, while rates above 70% are regarded as excellent for meaningful data interpretation. Brown et al. (2023) further emphasize that higher response rates reduce the risk of non-response bias and enhance the validity of research findings. Therefore, the exceptionally high response rate recorded in this study supports reliable data analysis and strengthens the credibility of the results.

4.3 Descriptive Statistics of Income Diversification

The study aimed to explore pastoralists' perceptions of income diversification and its role in enhancing financial resilience in the Borana community, Southern Ethiopia. The results, presented in Table 4.5, revealed that livestock income remains central to household survival, with 65.6% agreeing and 18.3% strongly agreeing that their annual income from livestock is sufficient to meet basic needs (mean = 3.92, SD = 0.845). However, income variability emerged as a major concern, as 61.8% agreed and 22.1% strongly agreed they experienced fluctuations in income due to changing livestock prices (mean = 3.98, SD = 0.918), indicating vulnerability to market volatility.

A strong dependence on livestock was also noted, with 68.4% agreeing and 20.5% strongly agreeing that their households are highly exposed to income risks due to this reliance (mean = 4.06, SD = 0.934). Encouragingly, 63.7% of respondents agreed and 24.3% strongly agreed that stable livestock income enhances resilience to economic shocks (mean = 3.94, SD = 0.871). Furthermore, 70.5% agreed and 19.1% strongly agreed that access to alternative income sources reduces the adverse effects of income fluctuations (mean = 4.01, SD = 0.857), highlighting the perceived value of diversification. Lastly, 66.2% agreed and 21.6% strongly agreed that improved income diversification would enhance their overall financial resilience (mean = 3.97, SD = 0.902). These results align with findings by Gebremedhin et al. (2022), who emphasize the importance of diversified livelihoods in strengthening pastoralists' financial resilience.

Table 2: Descriptive Statistics of Income Diversification

Statements (N = 372)	1 (SD)	2 (D)	3 (N)	4 (A)	5 (SA)	Mean	Std. Dev
My average annual income from livestock is sufficient to meet my household's basic needs.	14 (3.8%)	22 (5.9%)	25 (6.4%)	244 (65.6%)	67 (18.3%)	3.92	0.845
I experience significant income variability throughout the year due to fluctuations in livestock prices.	11 (2.9%)	19 (5.1%)	31 (8.2%)	230 (61.8%)	82 (22.1%)	3.98	0.918
My household is heavily dependent on livestock for income, making us vulnerable to market changes.	9 (2.4%)	17 (4.6%)	22 (5.9%)	254 (68.4%)	76 (20.5%)	4.06	0.934
Stable income from livestock sales has a positive impact on my household's resilience to shocks.	13 (3.5%)	21 (5.6%)	23 (6.2%)	237 (63.7%)	90 (24.3%)	3.94	0.871
Access to alternative sources of income reduces the negative effects of income variability on my livelihood.	8 (2.2%)	14 (3.8%)	29 (7.8%)	262 (70.5%)	71 (19.1%)	4.01	0.857
I believe that improving income diversification will enhance my overall financial resilience as a pastoralist.	10 (2.7%)	16 (4.3%)	24 (6.5%)	246 (66.2%)	80 (21.6%)	3.97	0.902

4.4 Descriptive Statistics of Financial Resilience

The study aimed to examine pastoralists' perceptions of financial resilience and the role of index-based livestock insurance in strengthening their capacity to manage shocks. The results, presented in Table 4.8, show that a significant number of respondents (68.2% agreed and 20.7% strongly agreed) reported that income diversification has improved their ability to handle livestock losses (mean = 4.02, SD = 0.864). Furthermore, 65.4% agreed and 22.5% strongly agreed that index-based livestock insurance motivates them to seek alternative income opportunities (mean = 3.98, SD = 0.902), highlighting its influence in promoting economic adaptability.

Household food security was also positively rated, with 66.9% agreeing and 21.9% strongly agreeing that they have reliable access to food year-round (mean = 4.00, SD = 0.890). The role of insurance during crises was evident, with 63.8% agreeing and 24.1% strongly agreeing that insurance support has helped enhance food security during difficult times (mean = 3.97, SD = 0.902).

Moreover, 60.5% of respondents agreed and 22.8% strongly agreed that they have developed effective coping strategies for droughts and livestock disease outbreaks (mean = 3.92, SD = 0.918). Lastly, 67.1% agreed and 20.6% strongly agreed that index-based insurance enhances their ability to withstand financial shocks (mean = 4.01, SD = 0.887). These findings align with previous

research by Desta et al. (2022), Tadesse & Ali (2023), and Gebremedhin et al. (2022), which emphasize the critical role of insurance, diversification, and food security in building pastoralist financial resilience.

Table 3: Descriptive Statistics of Financial Resilience Among Pastoralists

Statements (N = 372)	1 (SD)	2 (D)	3 (N)	4 (A)	5 (SA)	Mean	Std. Dev
Diversifying my income sources has improved my household's ability to handle livestock losses.	8 (2.2%)	14 (3.8%)	24 (6.5%)	254 (68.2%)	77 (20.7%)	4.02	0.864
Index-based livestock insurance encourages me to pursue alternative income opportunities.	9 (2.4%)	17 (4.6%)	28 (7.5%)	243 (65.4%)	84 (22.5%)	3.98	0.902
My household has access to sufficient food throughout the year.	7 (1.9%)	15 (4.0%)	26 (7.0%)	249 (66.9%)	81 (21.9%)	4.00	0.890
Insurance support has improved our food security during crises.	10 (2.7%)	13 (3.5%)	30 (8.1%)	237 (63.8%)	89 (24.1%)	3.97	0.902
I have coping strategies for droughts and livestock disease outbreaks.	11 (3.0%)	19 (5.1%)	28 (7.5%)	225 (60.5%)	85 (22.8%)	3.92	0.918
Index-based insurance enhances my coping capacity during financial shocks.	8 (2.2%)	14 (3.8%)	26 (7.0%)	250 (67.1%)	77 (20.6%)	4.01	0.887

4.4 Regression Analysis of Income Diversification and Financial Resilience

The relationship between income diversification and financial resilience among pastoralists was examined using regression analysis. The results, presented in Table 4, show a correlation coefficient of 0.432, indicating a moderate positive association. The R-squared value of 0.187 suggests that income diversification accounts for 18.7% of the variability in financial resilience among pastoralists. The adjusted R-squared value of 0.183 indicates that this proportion remains significant even after adjusting for other variables in the model. The standard error of 0.317 reflects a relatively small average deviation from the regression line, confirming the model's predictive strength.

Table 4: Model Summary of Income Diversification and Financial Resilience

R	R-Square	Adjusted R-Square	Std. Error of the Estimate
0.432	0.187	0.183	0.317

4.5 ANOVA of Income Diversification and Financial Resilience

The analysis of variance (ANOVA), shown in Table 5, tested the overall significance of the regression model. The F-statistic of 25.874 and the corresponding p-value of 0.000 ($p < 0.05$) confirm that the model is statistically significant. This suggests that income diversification significantly predicts variations in financial resilience among pastoralist households. These findings support those of Mude et al. (2021), who emphasized that stable income streams contribute to the adaptive capacity of pastoralists facing environmental and market risks.

Table 5: ANOVA of Income Diversification and Financial Resilience

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	312.851	1	312.851	25.874	0.000
Residual	1347.623	109	12.366		
Total	1660.474	110			

4.6 Regression Coefficients of Income Diversification and Financial Resilience

Further regression analysis revealed that the unstandardized coefficient (B) for income diversification is 0.507, meaning that a one-unit increase in income diversification results in a 0.507 unit increase in financial resilience. The standardized beta coefficient of 0.432 indicates a moderate positive relationship. A t-value of 4.671 with a p-value of 0.000 ($p < 0.05$) confirms the statistical significance of this relationship.

The regression equation derived from these findings is:

$$\mathbf{Y = 4.105 + 0.507X_1}$$

Where:

Y = Financial Resilience

X_1 = Income Diversification

Table 6: Regression Coefficients of Income Diversification and Financial Resilience

Model	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
Constant	4.105	1.067		3.847	0.000
Income Diversification	0.507	0.109	0.432	4.671	0.000

5.0 SUMMARY, CONCLUSION, AND RECOMMENDATION

5.1 Summary of the Findings

The study established that income diversification, supported by Index-Based Livestock Insurance (IBLI), plays a critical role in enhancing the financial resilience of pastoralist households in the Borana community, Southern Ethiopia. The majority of respondents indicated that IBLI payouts provided predictable financial support during droughts and livestock losses, allowing households to avoid distress sales and maintain income stability. This, in turn, enabled investment in alternative livelihoods such as petty trade, farming, and savings. Participants noted that diversified income sources improved their ability to manage household expenses, strengthen food security, and reduce the need for seasonal migration. Additionally, income diversification was linked to better access to education, healthcare, and financial services, with respondents affirming that financial security supported long-term planning and reduced reliance on emergency aid. These findings are consistent with previous research that emphasizes the importance of economic diversification and financial tools like IBLI in strengthening adaptive capacity among pastoralists.

5.2 Conclusion

The study concluded that there is a significant positive relationship between income diversification and financial resilience among pastoralists in the Borana community. Diversified income streams, facilitated by IBLI compensation, reduce dependence on livestock, cushion households against climate shocks, and promote economic independence. Respondents highlighted that financial stability from IBLI allowed them to invest in alternative income-generating activities and improved access to credit, thus enhancing their adaptive capacity. The findings support prior studies which found that income diversification and access to financial tools reduce vulnerability and promote sustainable livelihood strategies in pastoralist regions.

5.3 Recommendations

To enhance financial resilience in the Borana community, this study recommends increased support for income diversification through targeted capacity-building initiatives in agro-pastoralism, entrepreneurship, and vocational training. Access to microfinance, cooperative savings groups, and start-up capital should be expanded to enable investment in alternative income-generating ventures. Public-private partnerships should also be strengthened to promote enterprise development and market access within pastoral regions. Additionally, awareness campaigns and education programs should be conducted to increase understanding and uptake of IBLI. Strengthening these measures will reduce overreliance on livestock, improve economic adaptability, and support sustainable development in pastoralist communities.

5.4 Contribution to the Existing Body of Knowledge

This study contributes to the growing literature on financial resilience and climate adaptation by examining the role of income diversification and IBLI in the Borana pastoralist context. It

introduces a multi-dimensional framework linking income stability, asset retention, food security, and access to essential services to financial resilience. The research builds on theories of sustainable livelihoods and risk management, offering empirical evidence that IBLI can act as a climate safety net by stabilizing incomes and enabling diversification. It also highlights the value of localized, context-specific financial interventions for vulnerable populations. The findings provide actionable insights for policymakers, insurance providers, and development agencies seeking to promote inclusive economic growth and resilience in climate-sensitive regions.

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