VOL. 10 NO. 2,
NOVEMBER, 2025
E-ISSN 3027-1533
P-ISSN 3026-8648

African Scholar Publications & Research International
www.africanscholarpub.com

Journal of African Innovation & Advanced Studies (JAIAS)

Moderation Effect of Entrepreneurial Training on Local Government Authorities' Free Interest Micro-Credits and Fish Vendors in Tanzania

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DOI: https://doi.org/10.70382/ajaias.v10i2.048

Abstract

This study investigates the impact of Local Government Authority (LGA) interest-free micro-credits on the livelihood status of fish vendors in Tanzania, with a focus on the moderating role of entrepreneurial training (ET). Guided by a positivist research philosophy, the study employs a deductive approach and quantitative methods to objectively examine causal relationships. Drawing on Micro-Credit Theory and Human Capital Theory, it explores how access to free-interest or zero-interest loans, coupled with entrepreneurial training, influences business performance and overall livelihoods of fish vendors. A cross-sectional survey was conducted among 337 fish vendors across three LGAs, Kigamboni Municipal Council, Ilemela Municipal Council, and Mwanza City Council, using proportionate and stratified random sampling. Findings reveal that access to interest-free finance has a strong positive effect on livelihood status ($\beta = 0.899$, $t = 17.386$, $p < 0.001$), whereas entrepreneurial training alone has a minimal direct impact ($\beta = 0.031$). However, ET significantly strengthens the effect of finance on livelihoods (ET × FI → LS: $\beta = 0.018$, $t = 12.189$, $p = 0.001$). The study underscores that integrated interventions combining micro-credits with high-quality training yield sustainable socioeconomic improvements and recommends policy support through mentorship, institutional backing, and capacity-building initiatives.

Keywords: Microcredit, Fish Vendors, Entrepreneurial Training, Livelihoods, Local Government Authorities, Tanzania.

Introduction

Poverty is one of the conspicuous challenges globally. But it is more critical in African countries, partly due to the exclusion of poor individuals from financial services opportunities like micro-credits due to a lack of collateral (Ajah et al., 2024; Jamal et al., 2021). Poverty is chronic in Africa, particularly Sub-Saharan Africa, making 67% of all poor people reside globally (WB, 2024). In Asia and Latin American countries such as Pakistan, India, Bangladesh, and Indonesia, micro-credits have been used as income-generating strategies for poor populations excluded from traditional banking services (Mahmud et al., 2022). The concept of micro-credits originated in Bangladesh, started by Muhammad Yunus in 1976, where the poor, unemployed, and lacking collateral were made bankable (Mamun, 2020).

By 2007, microfinance institutions had served over 150 million clients globally, more than 100 million of whom came from the world's poorest communities, particularly in Asia and Latin America. In Sub-Saharan Africa, micro-credit borrowers exceeded 13 million, demonstrating the growing significance of micro-finance as a poverty intervention tool (Ajah et al., 2024; WB, 2024). African governments have widely adopted micro-credit mechanisms to increase access to capital for the poor, especially individuals without collateral, by offering low- or zero-interest loans (Ngige & Njuguna, 2023; Malamsha, 2023). Government Revolving Microcredits (GRMs) have played a central role in fostering entrepreneurship among marginalized and unemployed populations (Abebe & Kegne, 2023; Mangstie, 2022; Stephanie et al., 2021). By the 1990s, most African countries, including Tunisia, Morocco, Kenya, Botswana, Zambia, Zimbabwe, Ethiopia, and Tanzania, had implemented GRMs as part of their poverty reduction strategies (Hassan et al., 2022; Mzingula, 2020).

The fish vending sector significantly contributes to the livelihoods of urban poor populations in coastal and inland water areas. Globally, approximately 58.5 million people are engaged in fisheries, with women making up 21% of this workforce (FAO, 2022; Fabinyi & Barclay, 2021). In Africa, the number of people dependent on fisheries rose from 2.8 million in 1995 to 5.65 million in 2020 (Magesa et al., 2024; Jaheer et al., 2021). In Tanzania, over 2 million individuals are directly involved in fishing, and more than 4 million rely on related activities for their livelihoods (Mush, 2023; Jaheer et al., 2021). Fish vending supports household consumption, asset accumulation, savings, income, and housing improvements (Fabinyi & Barclay, 2021; Anosike, 2019). However, limited entrepreneurial skills and

education among vendors restrict the full realization of micro-credit benefits (Mulipula, 2023; Rejula et al., 2023).

Theoretical frameworks such as micro-credit theory advocate for accessible, low-interest or interest-free loans and group lending schemes to improve marginalized populations' livelihoods (Malamsha, 2023; Mollah, 2023). Human capital theory further highlights the impact of entrepreneurial training and demographic factors like education and experience (Rejula et al., 2023). While many studies have investigated the link between micro-credits and SME performance or socio-economic advancement (Boateng et al., 2024; Ghosh et al., 2023; Kariuki, 2023; Adarsh et al., 2023; Nnamani & Iwezor, 2022; Khan & Bedi, 2021), there remains a gap in evaluating the combined effects of government micro-credits and entrepreneurial training on the livelihoods of fish vendors in Tanzania.

In summary, micro-credits are a pivotal part of poverty reduction strategies across Africa, particularly when combined with entrepreneurial training and supportive government policies. Nonetheless, closing gaps in skills and education is essential for maximizing the developmental impact of these interventions.

Statement of the Problem

Tanzania has implemented multiple policies and strategies for poverty alleviation, such as the National Strategy for Growth and Reduction of Poverty (NSGRP), the Business Environment Strengthening (BEST) Program, and micro-finance initiatives. These are integrated into the Vision 2025 policy. Despite these efforts, around 25% of Tanzanians still live on less than 2 US dollars per day.

A significant government intervention has been the introduction of Local Government Authorities' (LGA) micro-credit programs, mandated to set aside 10% of annual collections for interest-free loans to women, youth, and people with disabilities (PWDs) (NAOT, 2024). By 2024, 65 billion Tanzanian shillings had been disbursed through these programs, benefiting groups such as fish vendors, who constitute over 30% of poor urban dwellers (Magesa et al., 2024; Mushi, 2023).

Recent studies have evaluated the impact of these programs. Magesa et al. (2024) found that women fish vendors engaged in value addition, such as fish frying, leading to market expansion and reduced wastage. Mushi (2023) highlighted proactive and reactive strategies among informal fish vendors, such as diversification and participation in capacity-building activities. However, previous research has not directly examined the role of LGA micro-credits and entrepreneurial training on the livelihood of fish vendors, nor considered demographic factors such as education and experience. while microcredit and entrepreneurship training have been studied separately, their combined effects on fish vendors in Tanzania remain underexplored. Therefore, while microcredit and entrepreneurship training have been studied separately, their combined effects on fish vendors in Tanzania remain underexplored.

Objectives of the study

i. To determine the impact of LGA micro-credits' free interest rate on fish vendors' livelihood status in Tanzania
ii. To examine the moderating role of entrepreneurial training on the relationship between LGA free interest micro-credits and the livelihood of fish vendors in Tanzania

LITERATURE REVIEW

Micro-Credit Theory

The micro-credit model, conceptualized by Dr. Muhammad Yunus in the 1970s and widely recognized as the "father of micro-credit theory," originated with the establishment of the Grameen Bank in Bangladesh (Bateman et al., 2019; Malamsha, 2023). This model posits that impoverished individuals can be deemed bankable through the provision of low-interest microloans, improved access to loans, and the utilization of social pressure to ensure repayment. The underlying belief is that such financial support can significantly contribute to poverty alleviation by empowering low-income individuals to initiate or expand entrepreneurial ventures, particularly in marginalized communities that typically lack access to formal credit systems requiring collateral (Bateman et al., 2019). Correspondingly, this study examines fish vendors who receive microloans from the Local Government Authority (LGA), characterized by zero interest rates, enhanced access, and collective liability, which aligns with the study's principal objectives.

Notwithstanding its positive implications, the micro-credit model is critiqued for various limitations, including the potential for business failure due to insufficient entrepreneurial training, which may lead to beneficiary defaults and non-profitable ventures. Furthermore, a reliance on short-term funding may fail to meet the demands of long-term investments necessary for substantial growth (Tshishonga, 2024). Additional concerns involve competitive disclosures, the displacement of new or existing micro-enterprises, and the contentious notion that impoverished individuals are simply entrepreneurs awaiting start-up assistance (Malamsha, 2023). The tenets of micro-credit theory have been explored across multiple scholarly works, addressing its intersection with microfinance: for instance, Russian et al. (2020) investigated the impact of micro-credit on the performance of small and medium enterprises (SMEs) in Malaysia; Mukhtar et al. (2023) examined women's entrepreneurial empowerment through the micro-credit model; Bettoni et al. (2023) focused on micro-credit effects for small businesses in Brazil; and Rahman & Ley (2020) assessed micro-credit's implications for housing credit in Bangladesh. Recent contributions include Domanban (2024), who evaluated micro-loan sizes as determinants of business performance among microfinance institutions in Ghana, and Tshishonga (2024), who explored the processes, challenges, and outcomes of micro-credit in women's groups in Mozambique. Particularly noteworthy is Malamsha's (2023) investigation of micro-credit's role in women's development funds in Tanga city, as well as Magali's (2022) study on the influence of VICOBA micro-

credits on women's empowerment in Tanzania. This research employed the foundational assumptions of micro-credit theory, namely, low-interest rates, loan accessibility, and group lending, positioned as independent variables that influence the dependent variables of business performance and livelihood status.

While the micro-credit theory aims to facilitate improved livelihoods for low-income populations through accessible micro-financing, low interest rates, and group lending, it is insufficient for fully elucidating the constructs within this study's conceptual framework. Consequently, Human Capital Theory (HCT) was incorporated to examine how entrepreneurial training and demographic variables, such as experience and education level, function as moderating and mediating factors. This integration aims to clarify the relationship between micro-credits, entrepreneurial training, demographic characteristics, and the livelihood status of micro-credit beneficiaries (fish vendors), as presented in the conceptual framework.

Human Capital Theory

Human Capital Theory, as an economic and social framework, asserts that individual attributes such as education, health, experience, training, and skills serve as critical assets influencing economic performance (Becket, 1975). Initially articulated by Adam Smith and later advanced by Gary Becker and Theodore Shultz in the 1990s, HCT emphasizes the role of education and experiential learning in augmenting worker productivity within organizations (Blundell et al., 1999). The theory emerged during a period of declining physical capital accumulation, where the importance of education and training became increasingly pronounced (Bonner et al., 2023). HCT posits that variables such as education, training, intelligence, and experiential knowledge significantly contribute to business success (Ahmed et al., 2023). Entrepreneurs or employees equipped with enhanced intangible skills and capabilities are found to improve business performance, particularly when training is effectively designed, delivered, and administered by qualified instructors (Njati & Omae, 2020). The current study harnesses HCT by positioning entrepreneurial training as a moderating variable, with education and experience acting as mediating constructs that connect LGA micro-credits to the livelihood status of fish vendors.

Nonetheless, HCT faces criticism for its reductive approach, which attributes productivity solely to individual talent and training while neglecting to critically assess the contextual realism and limitations of a singular theoretical perspective (Braunerhjelm & Lappi, 2023; Marginson, 2017). The theory advocates for a positive correlation between entrepreneurial education, training, and business performance; however, it often oversimplifies complex realities, viewing individuals as mere economic assets. Moreover, HCT presumes equal opportunities for access to training, education, and healthcare, overlooking significant social and financial barriers. Additionally, it inadequately addresses issues of skills mismatch and discrimination, which may result in unemployment and wage disparities. Therefore, this study

employs Human Capital Theory to explore the moderating role of entrepreneurship training in the relationship between LGA micro-credits and the livelihood status of fish vendors.

Free Interest Rate Loans and Livelihood Status

Numerous studies have established a robust correlation between the livelihood status of micro-credit beneficiaries and loan interest rates (Dayo et al., 2023). Yener et al. (2023) examined the relationship between micro-credit interest rates and economic growth in Turkey, employing regression analysis and the ARDL bound test. Their findings indicated a significant negative relationship between interest rates and the financial capacity enhancement of small and medium enterprises (SMEs). Notably, their methodological approach contrasts with the present study, which employs Structural Equation Modeling (SEM) and specifically investigates the benefits of Local Government Authority (LGA)-free interest rate micro-credits for the fish vending sector.

Khan and Bedi (2021) conducted a study on the returns from interest-free micro-credits in Pakistan, utilizing an experimental design that provided evidence on the benefits of interest-free loans to micro-enterprises. Their results demonstrated that such treatment augmentations significantly improved working capital and profitability compared to interest-bearing loans.

In a critical literature review, Kariuki (2023) assessed the performance of African lending institutions, uncovering that interest rates considerably influence profit before tax and return on equity. The findings underscored that lending institutions tend to engage more in borrowing when interest rates are at a lower threshold. However, Kariuki's focus on lending institutions contrasts with the current investigation's emphasis on free-interest loans available from the LGA in Tanzania.

Similarly, Otieno et al. (2021) analyzed the impact of lending interest rates on SMEs' performance in Kenya, using simple linear regression techniques. Their study revealed a negative correlation between loan interest rates and SME performance, ultimately recommending the adoption of more customer-friendly interest rates to foster job creation and investment. It is important to note that their focus was on SMEs' performance rather than on overall livelihood, and they employed SEM analysis in their methodology.

Additionally, Abdulkarim et al. (2022) explored the moderating influence of government intervention on the nexus between loan interest rates and SME performance through a quantitative analysis using SEM with a sample of 397 SMEs. Their findings indicated that both government intervention and interest rates significantly affect SMEs' performance, suggesting that government intervention should moderate the relationship between interest rates and SME outcomes.

Boateng et al. (2024) investigated the influence of interest rates on loan demand among rural banks in Ghana, utilizing a combination of descriptive statistical techniques and regression analysis. Their results indicated a positive effect of interest on loan terms and identified a significant correlation between interest rates and loan default rates. However, this study focused on rural banks and did not employ SEM for data analysis.

Adhiambo (2022) examined the moderating role of financial innovation and interest rate caps on credit accessibility for micro, small, and medium enterprises (MSMEs) in Kenya. The descriptive study, which sampled 420 MSMEs, found a statistically significant relationship between interest rates and access to credit, indicating that interest rates play a critical role in determining credit accessibility while also moderating the impact of financial innovation.

Moreover, Al-Mamun et al. (2020) investigated whether micro-credits assist individuals in establishing entrepreneurship as street vendors in Bangladesh. Their mixed-method study used descriptive statistics with a sample of 200 street vendors and revealed that only 20% of micro-loan beneficiaries utilized the funds for business initiation, while the majority allocated funds for various purposes, including livestock rearing and housing development.

In Tanzania, Msangula (2015) evaluated the effects of loan interest rates on SME performance and growth among beneficiaries of Vision Fund loans. This mixed-method study, which surveyed 83 respondents, concluded that increases in business capital, assets, and income were negatively impacted by loan interest rates. However, Msangula's research concentrated on vision loans, whereas the current study focuses specifically on LGA micro-credits that are devoid of interest rates.

Furthermore, Mushi (2023) explored the informal fish vending business's impact on the livelihoods of urban-based women fish vendors. Utilizing a qualitative phenomenological design, the study analyzed data from 110 fish vendors and concluded that fish vending significantly enhanced the livelihoods of these vendors, while recommending the initiation of soft loan programs and entrepreneurial training. Nonetheless, Mushi's study did not address the specific implications of LGA micro-credits on fish vendors.

Lastly, Charles (2022) investigated the effects of interest rate ceilings on the sustainability of microfinance institutions (MFIs) in Tanzania. Utilizing qualitative methods and surveying 53 respondents, the study found that interest rates significantly influenced competitiveness, operational capacity, and the presence of hidden fees, thereby impacting the sustainability of MFIs and informal lenders, with competition serving as a moderating factor for interest rates.

Ha1: *There is a positive relationship between free interest rate loans and the livelihood status of fish vendors Entrepreneurial Training (ET) on Micro-credits and Livelihood*

Entrepreneurial Training (ET) is instrumental in equipping individuals with the necessary skills and knowledge to initiate, manage, and grow businesses. The primary focus of ET is on potential entrepreneurs, particularly vulnerable populations, unemployed individuals, and those currently operating micro, small, and medium enterprises (MSMEs) (Al-Awlagi et al., 2021). Evidence supports ET as an effective mechanism for fostering entrepreneurial practices (Weers et al., 2020).

Zhuang and Sun (2023) examined the moderating role of Entrepreneurial Education (EE) concerning the institutional environment and entrepreneurship intention (EI). Their study, which included a sample of 601 entrepreneurs and utilized the PLS-SEM model for data

analysis, found no significant moderating effects of EE on the relationship between institutional environment and EI. It is noteworthy that this study primarily focused on EE rather than ET.

Further contributing to the discourse, Horvath (2019) assessed the moderating influence of ET on the interplay between financial bootstrapping and the performance of SMEs in Hungary. Analyzing a sample of 70 Hungarian SMEs using bootstrap techniques, the findings indicated that ET positively moderates the relationship between employment growth and financial bootstrapping. However, this research did not specifically address the role of government micro-credits in this context.

In a similar vein, Al-Momani et al. (2023) explored the moderating impact of ET on the effect of motivation on the performance of pharmaceutical SMEs in Jordan. The study, which surveyed 162 respondents and employed Structural Equation Modeling (SEM) for data analysis, revealed that ET significantly and positively moderated the influence of innovation on the performance of pharmaceutical SMEs, though it did not extend its focus to the fish vending sector.

Toumi et al. (2023) investigated the moderating effects of entrepreneurship development programs on economic and political empowerment associations in Tunisia. Conducting a quantitative study with a random stratified sample of 343 participants, their research concluded that entrepreneurship training enhances individual economic and political empowerment associations, albeit without a specific focus on fish vendors.

Additionally, a meta-analytical study by Weers et al. (2020) suggested that ET positively influences entrepreneurship outcomes in both the short and long term by instilling essential skills beneficial for business performance. However, this study did not utilize ET as a moderating variable, despite advocating for methodical training suited to the needs of trainees.

Lastly, Mkama (2024) examined the impact of entrepreneurial training on the business performance of food vendors. This quantitative explanatory study, incorporating Partial Least Squares Structural Equation Modeling (PLS-SEM) with a sample of 302 female food vendors, found that ET significantly and positively influences product or service innovation, although it did not emphasize free-interest government micro-credits. The contrasting findings and existing gaps within the industry underscore the necessity for the current study, which specifically targets fish vendors.

Ha2: *Entrepreneurial training positively moderates the relationship between free interest rates and the livelihood status of fish vendors*

Conceptual Framework

According to Cohen et al. (2017), a theoretical framework is a systematically assembled and interconnected group of notions and premises used to support a study. It is assumed to portray a scientific hypothetical argument on pre-assumed relationships among study independent and dependent constructs (Varpio et al., 2019). The conceptual framework hypothesizes that LGA

free interest micro-credits impact livelihood status and the relationship is strengthened by entrepreneurial training i.e., free interest loan beneficiaries who receives entrepreneurial training utilizes better the loans hence improve their lives. These constructs developed based on micro-credit theory and human capital theory. Therefore, the framework based on these theories proposes that loan accessibility, interest rate and group lending as exogenous constructs have a direct impact on the livelihood status of fish vendors as beneficiaries of LGAs' micro-credits. The framework also proposes that the relationship between micro-credit and livelihood status is moderated and moderation by entrepreneurial training to fish vendors.

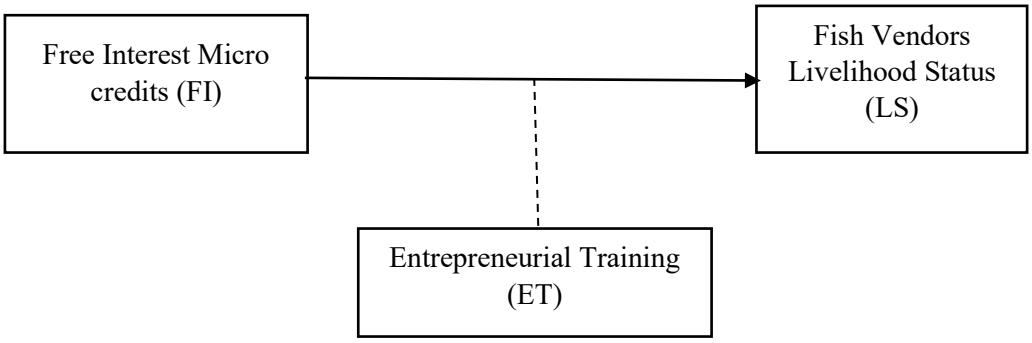


Figure 1. Conceptual Framework

METHODOLOGY

Study Philosophy

According to Saunders et al. (2019), research philosophy or paradigm entails gathering and analyzing data for a particular truth. It also narrates on the metaphysical belief study researcher contemplates the social world (Mitchell, 2018).

Positivism as one of the research philosophies introduced by August Conte in the 18th century, believes that knowledge should be objective, free from researcher bias, and be scientifically measurable (Maretha 2023). This study applied positivism due deductive nature and as it was independent on facts by testing hypotheses, and human or researcher interest had no influence on study findings. The positivism generates explanatory association that lead to prediction and control of situation. Moreover, the positivism paradigm was chosen because it allows natural generalization and draws conclusions and recommendations of phenomena based on quantitative methods (Zukauskas et al., 2018; Mitchell, 2018).

Study Approach

Saunders et al. (2019) and Cresswell (2007) conceptualize the research approach as a plan and procedures for research that validate steps from extensive assumptions to exhaustive data analysis and interpretation techniques. The appropriate adoption of research leads to valid and reliable findings that result in true final decision-making (Santor et al. 2011). In this regard, the study applied deductive approach as it emphasizes moving from general to data by showing the association of variables. Afoakwah (2024) & Meisa et al. (2024) deductive approach

enhances systematic framework for deriving knowledge and hypothesis verifications, allow quantitative measure for concepts and broader contextual application of study findings. application of findings. Thus, use of the deductive approach on issue of impact LGA free interest micro-credits and the livelihood status of fish vendors, which is moderated by entrepreneurial training had been appropriate to measure concepts quantitatively.

Study Design and Strategy

Study design implies a universal framework employed to respond onto study questions or hypotheses (Saunders et al. 2019; Sass & Smith 2011). The explanatory research design was appropriate for this study as it assessed the causal and effects association of variables study (Hossi & Berk, 2023).

Moreover, cross-section survey strategy applied as it permits collection of quantitative data from large population in a cost-effective technique" and data were collected once from sample population representing target population. Also, survey strategy allows quantitative data analyzation to show cause and effect forecast, depiction, implication and association through a deductive approach (Saunders et al. 2019). It capacitates collection, maintenance, and analyzing first-hand primary data (Lestari et al. (2020). The cross-sectional survey was appropriate application of postivism paradigm, time given for the study and flexibility of survey on data collection and analysis relevant to the study objectives and inferential statistics.

Target Population

Cooper & Schindler (2014) and Saunders et al. (2019) state that a survey population is a collection of units in the area where the sample found or entire population unit for which survey data drawn. In this study population implies a group of people from whom samples are selected and study findings reveals reality of it as whole. The population for this enquiry comprised all beneficiaries of LGAs free interest micro-loans mandated through the amendment of LGF Act Cap 290 sec 37A in 2018, following 1993 parliamentary introduction in Tanzania. The target population focused on three LGAs revolving micro-loans beneficiaries. Thus, study target population was 624 fish vendors from Kigamboni Municipal Council (KGMC) in Dar es salaam, Ilemela Municipal Council (IMC) and Mwanza City Council (MCCA) in Mwanza.

Study Area

Saunders et al. (2019) state that the survey area denotes a distinctive geographical locality where research anticipates conducting an inquiry to obtain truth about an event. The study investigation site was limited to LGAs which considers fish vending one of major economic activity. Hence, KGMC in Dar es Salaam and IMC and MCC in Mwanza. These LGAs were designated because are allocated alongside large water bodies such as Indian ocean and Lake Victoria respectively. Thus, people residing in this LGAs are likely to engage into fishing activities compared to other people residing far from forementioned large water bodies areas.

The other reason for selecting these LGAs is presence of giant fish markets which are Feri fish market in Dar es Salaam, Mukuyuni and Kirumba fish market that motivate residents to engage fishing activities. Moreover, theses LGAs found to have many fish vendors benefited from free interest rate micro-credits offered by the government via LGAs. Moreover, researcher included groups of fish vendors that had at-least a year after securing loan.

Sampling Design and Procedures

Broadly sampling design may either be probability or non- probability, due to the positivism nature of the study two sampling techniques were involved; proportionate sampling and stratified random sampling design were appropriate (Cresswell 2007). The Daniel sampling formula used to get proportionate sample from each of three selected LGAs. Then, stratified random sampling method as a new version of probability sampling where sample frame is grouped into strata was applied so as to enable the researcher to exactly extract number of samples from each ward which had group of fish venders secured loan in the selected LGAs ((Thomas, 2020; Saunders et al. 2019).

All wards from the three selected LGAs with their micro-credit beneficiaries were identified and respondents were sampled proportionately at random from each group in every ward to equate total sample (table. Appendix 2). These designs were applied to provide equal chance for members of the population to be participants hence avoid researcher biasness and systematic errors (Santor et al. 2011; Visser et al. 2000).

Sample Size of the Study

Sample size infers a subset of the study population used as respondents by the researcher (Saunders et al. 2019). The study target population was 624 fish vendors: 297 from IMC, 244 from MCC and 83 from KGMC. A total of 337 sample size was used in this study. Where, from IMC, 82 from MCC and 42 from KGMC. The Daniel formula was used to calculate the proportionate number of samples from each of the three selected LGA.

The formula Daniel (1999) for sample size states that:

$$n = [z^2 \times p \times (1-p)/e^2]/[1+(z^2 \times p \times (1-p)/(e^2 \times N))]$$

Where: z = 1.96 for a confidence level (α) of 95% (0.05), p = proportion 30% (expressed as a decimal 0.3), N = population size, e = margin of error.

Fish vendors from KGMC were 82.

$$n = [〖1.96〗^2 \times 0.3 \times (1-0.3)/〖0.05〗^2]/[1+(〖1.96〗^2 \times 0.3 \times (1-0.3)/(〖0.05〗^2 \times 83))]$$

$$322.6944 / 4.88788 = 66.019 \approx 66$$

Fish vendors from MCC were 244.

$$n = [〖1.96〗^2 \times 0.3 \times (1-0.3)/〖0.05〗^2]/[1+(〖1.96〗^2 \times 0.3 \times (1-0.3)/(〖0.05〗^2 \times 244))]$$

$$196.843584 / 1.416736 = 138.9416 \approx 139$$

Fish vendors from IMC were 297.

n = [〖1.96〗^2×0.3× (1-0.3)/〖0.05〗^2]/[1+(〖0.05〗^2×0.3×(1-p)/ (〖0.05〗^2×297))]

322.694 / 2.0865 = 154.657 ≈ 154

Therefore, the sample size was 66+139+154 from KGMC, MCC, and IMC, respectively, making a total sample of 359 fish vendors who benefited from the LGAs' micro-credits offered via the LGAs 10% own source annual revenues from the respective councils.

ANALYSIS PREPARATIONS

Data preparation involved both data cleaning and coding. Data cleaning include the entire process of checking and correcting errors, removing duplication data and detecting the missing data that could lead to inaccuracy data in the data file (Tabachnick and Fidell, (2013). The researcher checked for incompleteness and inconsistency of the data during data preparation to ensure the data are clean Kumar (2011) insisted on the importance of cleaning the raw data to reduce possible incompleteness, gaps, misclassification and errors. The data were then coded and entered into IMB SPSS 27 which was used to clean data before importing data into Smart PLS4 for model measurement and structural model assessments.

Missing Data

Missing data are referred to as unavailable values from a question or several questions due to the non-responses of the respondents that may affect results in the data analysis (Hair et al., 2010). Missing values accounting for no more than 1% of total values pose no problem; accounting for about 5% poses a bearable threat, and accounting for 15% or beyond of total responses represents a severe issue for the outcome of the research (Acuna & Rodrigues, 2004). Hence, missing values must either be treated by pre-replacing or via the Expected Maximization (EM) approach (Adebambo et al., 2014).

The pre-replacement method was opted in this study, i.e., 40(10%) of the sample were added before actual data collection (Ogbolu, 2021). This study employed a face-to-face self-administered questionnaire where respondents were given the questionnaires and asked to fill in the answers to the questions. The Researcher trained two assistants from each of the surveyed wards. Supplied 399 (100%) questionnaires, including 40 (10%) replacement questionnaires. All 399 (100%) questionnaires were returned and screened for missing data analysis. After meticulously inspecting the returned questionnaires, 28 (7%) of the questionnaires were found to have missing values and were deleted using the listwise method of dealing with missed values. The listwise deletion method was applied as the pattern of missing data occurred in a completely random way, i.e., completely at random (MCAR). Hence, a list-wise technique was employed to delete the 28 questionnaires replacement questionnaire was included (Tabachnick and Fidell, 2013). Thus, 370 (94%) of the total questionnaires were found useful for data analysis.

Similarly, Hair et al. (2023) suggests that less than 10% cases with missing values that are completely at random can be ignored from the data set since they do not much reduce the

sample size. Since the study found 7% of the total sample with missed values, this assures an insignificant impact, hence the data analysis process proceeded.

Outliers

Outliers imply anomalous tendencies of a nonconformity of data from its normal data changeability (Wong, 2019). Outliers distort the normality of data distribution; therefore, affecting the normality of data can significantly lead to false findings since normality accounts for the vital assumption of structural equation modelling (SEM) (Hair et al, 2021; Ghasemy, 2020). In this study, outliers were checked and identified in data set, and removed before further data analysis. This was performed using range of questionnaire that 1-7, box plots and standardized values (z-values) at threshold of positive or negative 3.29. Furthermore, the standardized values were assessed for the items (Z-value) with a cut-off point greater than ±3.29.

With minimum and maximum at 1-7 range particularly for constructs, all of the data set adhered the range (appendix 10). On the other hand, box plots indicated on significant outliers as few numbers identified out of box plot shown by circle rather stars i.e., they could not affect the results (appendix 11). To prove beyond doubt, the researcher had to run the standardized value (Z-scores) at the threshold of ±3.29. The findings revealed no any value appeared greater the threshold hence dataset was statistically virtuous for further analysis.

Testing Essential SEM-PLS Assumptions

The author tested the essential the essential statistical assumptions for PLS as a multivariate data analysis to confirm normality and linearity of dataset before measurement and structural assessment of the model. (Hair et al, 2021; Kline, 2023). Here is the results confirmation:

Normality Test

Most of the statistical results are centered on the concept that outcome variables, model residuals are normally distributed, particularly for multivariate analysis. Though SEM-PLS assumes data are normally distributed and can't affect the result, testing normality assures the result of data beyond doubt, leading to precise results (Hair et al, 2021; Sarstedt et al, 2022). Thus, the study had to test data set normality in order to avoid distortion of findings accuracy that can hence result in jeopardizing findings (Hair et al, 2021). The study applied skewness and Kurtosis to explore the normality of the data set. As Peng-Zhou & Song (2024); Nashimura & Shindo (2024), and Rademaker et al (2020) recommend, study realized skewness and kurtosis by observing the deviation of data from the mean and peak of data set respectively.

Thus, data normality was detected through either the accumulation into the right or left of the mean i.e., positive or negative skewness, respectively. On the other hand, negative and positive kurtosis indicated by flatter spread and heavier tails of high peak consecutively. Though, no rule of thumb of threshold for skewness and kurtosis, many studies propose that, their values

should not exceed 2.0 for skewness and 5.0 for kurtosis (Hair et al, 2023; Peng-Zhou & Song, 2024).

Appendix 1 illustrated that the skewness and kurtosis values range in the recommendable threshold, that it should not exceed ±2. Thus, prove that the result of gathered data of the study was normally distributed due to fact that skewness and kurtosis was below ±2.

Collinearity Test

The study tested collinearity statistics to find out if independent variables are highly or moderately correlated. The collinearity was examined via the independent variable indicators' explanatory power and predictive power. (Hair et al, 2021; Rademaker et al, 2020; and Sarstedt & Cheah, 2019). The study used tolerance values and variance inflation factors (VIF) in a regression model to test collinearity of independent variables. The values of tolerance and VIF show the extent to which independent variables do not explain each other. The threshold of value below ≤0.10 and ≥5 indicates the presence of multi-collinearity among independent variables of tolerance, and VIF indicates the presence of multi-collinearity, respectively (Hair et al, 2021; Ghasemy et al, 2020). The illustration of Table 4.6 proves that all independent variables in the model have a tolerance value of greater than 0.10 and then a VIF of less than 5. Thus, multicollinearity is not an issue in this study.

Measurement Model Assessment

The quality of the model was assessed using model measurement via establishing the relationship between latent variables and their indicators. Thus, the reliability and validity of constructs were evaluated. Therefore, reliability is observed via factor loadings of each indicator, Cronbach's Alpha, and composite reliability, while construct validity is assessed through convergent and discriminant validity applied to extract model quality.

Factor Loadings

Most indicators in the measurement model showed strong factor loadings, supporting their reliability in measuring the intended constructs. However, a few items, ET5, FI5, LS5, and LS8, had loadings below the recommended threshold of 0.70 and may need revision or removal. While loadings above 0.70 are ideal, those between 0.50 and 0.70 can be acceptable if conceptually justified (Hair et al., 2019). Overall, the model demonstrates acceptable measurement reliability with minor areas for improvement.

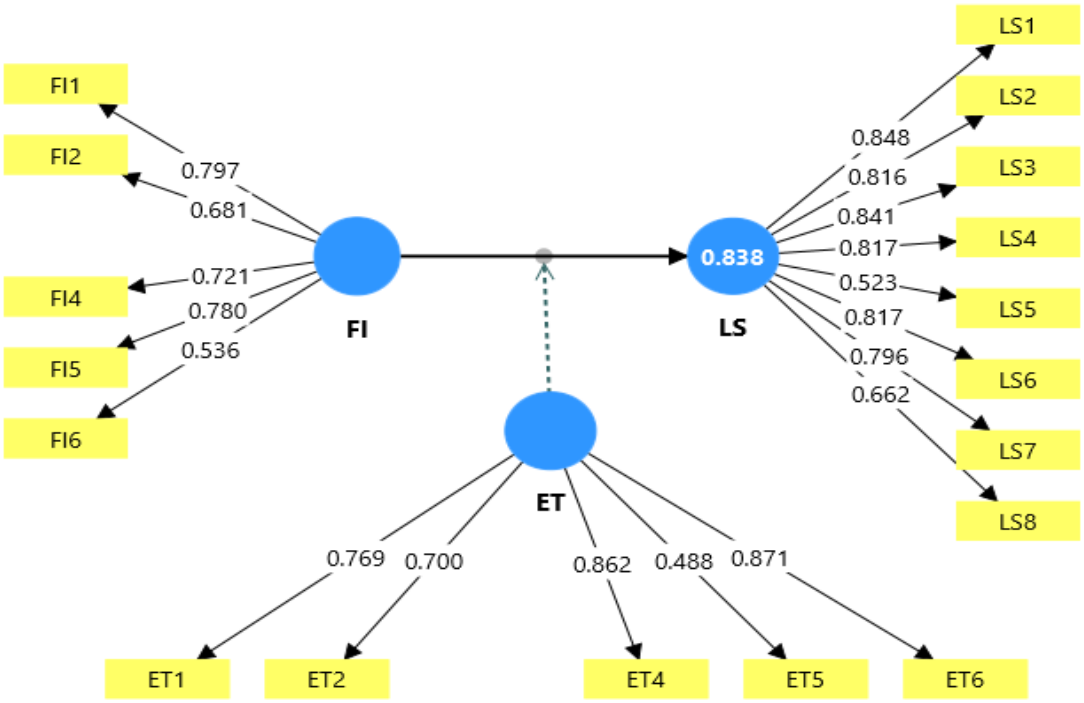


Figure 2. Model Factor Loadings

Reliability and Validity Assessment

Hair et al. (2021) and Saunders et al. (2019) infer reliability as the degree to which the data collection methodologies and analytic procedures would come out with indistinguishable findings by carrying out the same study. On the other hand, validity tries to find out whether the study measurement tool measures what it is designed to measure. The reliability, convergent validity, and discriminant validity of the constructs, Entrepreneurial Training (ET), Interest-Free Rate (FI), and Livelihood Status (LS), were assessed. All constructs showed acceptable to excellent reliability, with Cronbach's alpha and composite reliability values exceeding the recommended 0.70 threshold (Nunnally & Bernstein, 1994; Hair et al., 2019). Convergent validity was confirmed as all AVE values were above 0.50 (Fornell & Larcker, 1981).

Discriminant validity was evaluated using the Fornell–Larcker criterion and the HTMT ratio. While HTMT values were all below the conservative cutoff of 0.85, indicating good discriminant validity (Henseler et al., 2015), the Fornell–Larcker results showed a potential issue between FI and LS, as the square root of AVE for LS was slightly lower than its correlation with FI. Despite this, the model demonstrates overall reliability and validity, supporting its suitability for further analysis.

Table 1: Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE)

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
ET	0.780	0.825	0.847	0.594
FI	0.747	0.765	0.833	0.503
LS	0.900	0.911	0.921	0.596

Source: **Field Data (2024)**

Table 2: Heteroit Monotrait Ratio (HTMT)

Constructs	ET	FI	LS	ET x FI
ET				
FI	0.150			
LS	0.318	0.212		
ET x FI	0.213	0.257	0.248	

Source: **Field Data (2024).**

Table 3: Fornell-Larcker Criterion Result

Constructs	ET	GL	LS
ET	0.759		
FI	0.670	0.835	
LS	0.652	0.792	0.740

Source: **Field Data (2024).**

Structural Model Assessment

Model Predictive Power (R^2) and Relevance (Q^2)

The structural model's explanatory and predictive power for Livelihood Status (LS) is strong. The coefficient of determination (R^2) for LS is 0.709, indicating that approximately 71% of the variance in LS is explained by the model. This reflects a substantial level of explanatory power (Hair et al., 2019). Additionally, the Q²_{predict} value of 0.677 suggests that the model has high predictive relevance for LS, well above the recommended threshold of 0.35. Together, these results confirm that the model not only explains but also accurately predicts outcomes related to livelihood status.

Table 4: R2 and Q2 Result

	R-square	Q²predict
LS	0.709	0.677

Source: **Field Data (2024)**

FINDINGS AND DISCUSSION

Total Direct Effects

The study demonstrates that access to interest-free finance (FI) has a strong and statistically significant positive effect on livelihood status (LS) ($\beta = 0.899$, $t = 17.386$, $p < 0.001$). This finding aligns with Sapkota (2025) in rural Nepal, who reported that microcredit programs increased farmers' income, assets, and decision-making capacity. Similarly, Saif Ullah et al. (2025) in low-income areas of Pakistan found that microfinance supports business growth and entrepreneurship development through improved loan access. These studies highlight the pivotal role of affordable financial resources in empowering low-income individuals, supporting the current finding that LGA interest-free microloans enhance the economic and social well-being of fish vendors.

In contrast, entrepreneurial training (ET) alone has a minimal direct effect on LS ($\beta = 0.031$), suggesting that training without financial support may not substantially improve livelihoods. This concurs with Valerio et al. (2019), who found that training increases knowledge and skills but often fails to produce tangible economic outcomes without complementary finance. Nyior (2025) in Nigeria and Chen, Zhang, & Li (2024) in rural China similarly reported that training benefits are limited unless paired with financial or institutional support. These findings indicate that while ET is important, its effectiveness depends on access to financial resources, reinforcing the need for integrated programs that combine training with interest-free finance for sustainable livelihood improvements.

Moderation Effect

The interaction between entrepreneurial training (ET) and interest-free finance (FI) (ET × FI → LS) is positive and significant ($\beta = 0.018$, $t = 12.189$, $p = 0.001$), indicating that ET enhances the impact of financial resources on livelihood status. Studies by Adeyanju, Mburu & Gituro (2023) in Kenya and Uganda and Awan, Gul et al. (2025) in Pakistan show that combining training with financial support significantly improves income, food security, and poverty reduction outcomes. Bandiera et al. (2020) and Benz et al. (2022) similarly found that entrepreneurial training strengthens the effectiveness of financial programs by improving decision-making, planning, and business management. Figure 4 in this study confirms that fish vendors with higher ET leverage interest-free microloans more effectively, achieving greater and more sustainable livelihood improvements than those with lower or no training.

However, some studies report less consistent outcomes. Nyior (2025) in Nigeria and Valerio et al. (2019) globally found that ET alone produces limited economic benefits when financial access or institutional support is absent. Horvath (2019) in Hungary observed that training improved knowledge but did not consistently lead to business growth for small enterprises without adequate financing. These findings suggest that while ET is a valuable enhancer of FI, its effectiveness depends on contextual factors, including access to capital, mentorship, and institutional support, emphasizing the importance of integrated programs for sustainable livelihood improvements. (*Table 5, Figure.3 &.4*)

Table 5: Direct Indirect Total Effects

Hypothesis	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
ET x FI -> LS	0.018	0.018	0.015	12.189	0.001
FI -> LS	0.899	0.901	0.052	17.386	0.000

Source: **Field Data (2024)**

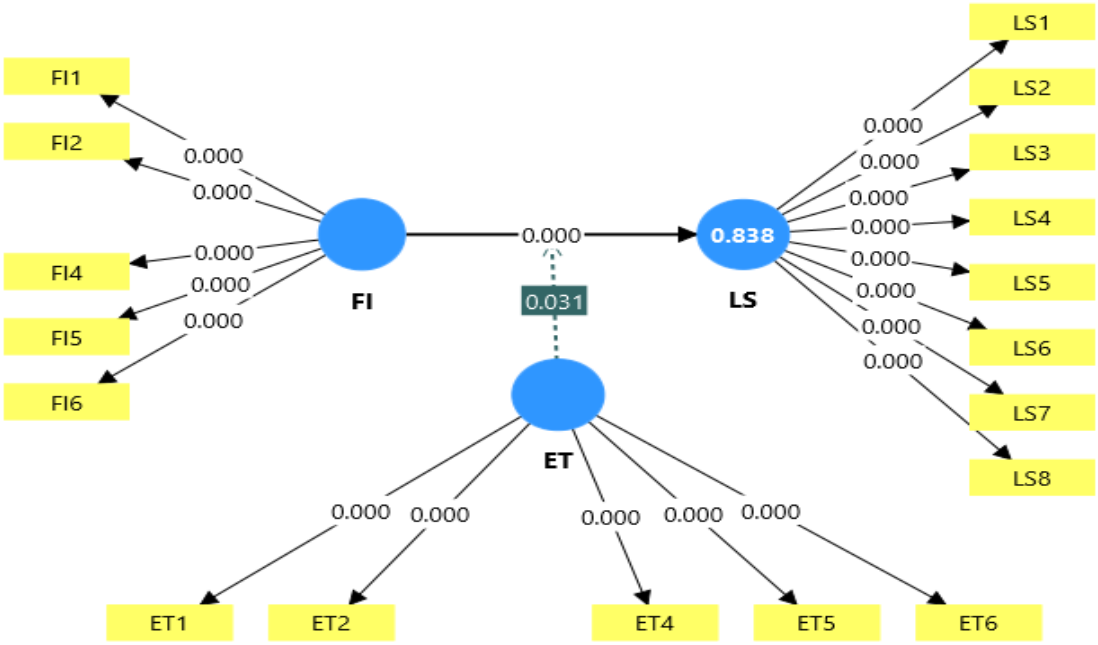
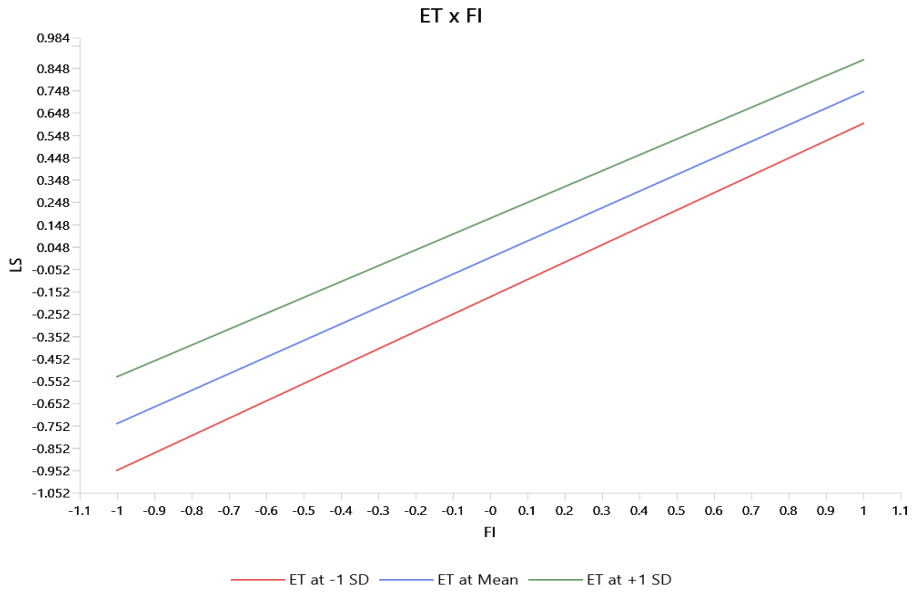


Figure 3. Model Path Coefficients



Fgure 4. Moderation Slope Analysis

CONCLUSION

The study shows that interest-free financing (FI) is the strongest driver of livelihood improvement, demonstrated by its large and significant effect on livelihood status **(**$\beta = 0.899$, $t = 17.386$, $p < 0.001$**).** Entrepreneurial training (ET) contributes very little on its own **(**$\beta = 0.031$**),** indicating that training alone does not meaningfully improve livelihoods. However, ET becomes valuable when combined with financing, as shown by the significant moderation effect **(**$\beta = 0.018$, $t = 12.189$, $p = 0.001$**).** This means individuals with more training are better able to use financial resources to improve their lives. Overall, the findings suggest that the greatest livelihood gains occur when financial support is paired with entrepreneurial training.

RECOMMENDATIONS

i. Strengthen Integrations of Microcredits and Human Capital Theories; The findings highlight the complementary role of free interest loans (FI) and entrepreneurial training (ET) in improving livelihoods. Theoretical models should move beyond siloed approaches and emphasize interaction effects**,** recognizing that access to resources and the capacity to use them are mutually reinforcing.

ii. Revisit Role of Entrepreneurial Training in Livelihood Frameworks; Given the limited direct impact of entrepreneurial training on livelihoods, existing livelihood and entrepreneurship development theories may overstate the standalone value of training**.** Future theoretical frameworks should account for mediating and moderating factors**,** such as access to finance, market conditions, and social support systems

iii. Expand Access to Free Interest or Affordable Microcredits; Governments and development agencies should prioritize financial inclusion initiatives, especially in underserved communities. This may involve: supporting microfinance institutions and community savings schemes, encouraging Islamic finance models, or other interest-free financing mechanisms, and removing structural barriers to credit access for low-income individuals.

iv. Integrate Entrepreneurial Training with Financial Support Programs; Rather than offering standalone training, policymakers should design integrated programs that combine: Entrepreneurial skill development. Access to financial capital. Business mentoring and follow-up support.

LIMITATIONS AND AREAS FOR FURTHER STUDIES

The study is limited by its focus on fish vendors in selected LGAs of Tanzania, which may restrict the generalizability of findings to other regions, sectors, or populations. Additionally, reliance on self-reported data introduces potential response bias, and the cross-sectional design prevents assessment of long-term effects of micro-loans and entrepreneurial training. Future research could expand to other geographic areas and types of micro-enterprises, use longitudinal designs to track the sustainability of livelihood improvements, and explore additional moderating or mediating factors such as social networks, market access, or

institutional support to better understand the conditions under which training and financial interventions are most effective.

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