# RURAL FISH ENTERPRISE GROWTH BASED ON ENTREPRENEURIAL PRACTICES IN TANZANIA

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## ABSTRACT

**Purpose:** The research aimed to compare the growth of rural fish enterprises among the fish traders in the Misungwi and Magu districts. Precisely, the research fulfilled objectives are to (i) establish associations between fish traders' innovation mindset, market orientation and risk-taking and (ii) establish if a statistical difference exists between Misungwi and Magu enterprises owned by fish traders.

**Design/Methodology/Approach:** This research was cross-sectional, using a sample of 297 fisher and fish traders from the Misungwi and Magu districts in the Mwanza region along Lake Victoria. The sample choice procedure was proportionate stratified sampling, given that the populations of fishers and fish traders in the Misungwi and Magu districts differed. Crosstab was performed to generate Chi-Square values to measure associations among associated variables. Further, computations of Phi coefficients were undertaken to measure the size effect of the associations established. An independent samples t-test afterwards was conducted to estimate the differential existence of rural fish enterprises between Misungwi and Magu fish traders.

**Findings:** The results further illustrate that statistically, the age of fish traders, experience in business, startup capital, capital invested in 2023 and number of employees at start-up were different between Misungwi and Magu fish traders and their differences using Eta Squared were estimated to be small for age of fish traders, experience in business and number of employees while that of startup capital invested and capital invested in 2023 were moderate.

**Research Limitation:** Due to time and financial resources, the research was restricted to Misungwi and Magu districts in the Mwanza region and adopted only quantitative data capture.

**Practical Implication:** The results will inform the industry's formulation of collaborative programmes for capacity building for fish traders in financial management, marketing, and entrepreneurship.

**Social Implication:** A flourishing Fisher enterprise will have a spillover effect on the rural community by increasing the employment rate and livelihood.

**Originality/ Value:** This research represents a significant advancement in understanding and developing rural fish enterprises through entrepreneurial approaches, filling a crucial gap in academic literature and practical implementation.

***Keywords:*** *Comparative. entrepreneurial. fish enterprise. lake victoria. Tanzania*

## INTRODUCTION

Rural entrepreneurship has been highly pronounced globally as it aims at job creation and improved livelihood. Considering the global case, Tabares et al. (2022) used systematic review research collecting 50 published articles in a database housed by Scopus from 2002 to 2022. The research argued that most research focuses on urban and ignores rural settings. The results informed that entrepreneurship in rural settings has supported women and youth, alleviating poverty and social entrepreneurship. The sector covering aquaculture and fisheries globally in 2024 produced 214 million tonnes, helped to alleviate food security, and created millions of jobs (Singh et al., 2024).

The evidence from the reported research can be extensively interpreted that fish traders globally have profitable income opportunities. However, income for others through jobs created by businesses becomes essential for economic growth. Paptsov et al. (2021) in Russia reported the growing potential for exports of fish products; it is forested that in 2024, Russia's earnings from fish products will be USD 1,338 million. The exports captured from 2013 were 57% but continued to increase up to 78% in 2017, though it experienced a meagre drop to 70% in 2018 (Paptsov et al., 2021). Such an increase in exports of fishery produce entails increased traders' income and consequently positively impacts their livelihoods and contributions to job creation and economic growth.

Despite the high potential for the export of fish presented by Paptsov et al. (2021), challenges like the deteriorating morals of the fish fleet and inadequate facilities with high technology for fish processing hinder the sector's progress. FAO (2024) in Europe reported that for the result-based transformation of fisheries that will result in the sustainability of resilience in nutritious food security and livelihood, serious sector financing should be one priority in the blue economy. Generally, the research reviewed from the global perspective provides varied aspects with little consensus due to different focal points, methodologies applied and resulting outcomes.

In the context of Africa, Munguti et al. (2024) identified impediments to the Eastern African fishing sector, including inadequate ingredients feed quality, complications related to regulatory bodies, limited measures for controlling quality, unsupportive infrastructure, limited understanding and unawareness of calculations for feed and management. Such impediments hamper the fishery sector and fish trading in excelling at fulfilling the business goal of enterprise growth.

The study of Nyengere et al. (2024) in Malawi and the countries bordering Malawi informed strategic issues that hinder the high performance of the fish sector, including the existence of several applicable destination alternatives, the distance of the route, transport mode, fish demand,

risks and safety regarding individual fish traders practically impeded the selection of either destination and route of trade among fish traders operating informally. The research of Chan et al. (2021) pointed out that in Africa, the sector engaging in fishing is anticipated to grow by creating jobs equivalent to 20.7 million by 2030. It will increase jobs equivalent to 21.6 million by 2050, and the investment in the sector reach USD 1.8 billion annually up to 2050. The exponential fishery sector creates jobs and expansion in investment, but most reviews research does not consider dealing with specific cases in rural and also makes comparative consideration on enterprise growth. Further, the issues of entrepreneurial integration in the fishery sector are also considered as an integral aspect.

In a Tanzanian fishery business environment, the study of Salehe et al. (2024) pointed out that entrepreneurs in the fishery sector entrepreneurially have compatible behaviour regarding this business. The results indicate that fishery entrepreneurs in Lake Victoria demonstrated innovation, risk-taking, and entrepreneurial values and were proactive, and all these variables were significant statistically. The results further informed that fishery entrepreneurs were being constrained with inadequate initiatives on education-related matters, which, interpretatively, lacked relevant entrepreneurial training. These results emanated from multiple linear regression, while the current study compared fishery enterprise growth in rural settings between Misungwi and Magu districts. The comparative study was crucial given that the resources are scarce, whereas policy intervention requires prioritising the limited resources available.

In this regard, the research focused on comparing rural fish enterprises between the Misungwi and Magu districts in the Mwanza region of Lake Victoria. Standing (2017) informed us of the rural fish enterprise growth status, where the research presented numerous constraints amongst fishing, such as adopting illegal alternatives, insufficient accountability, and imperfect government investment, suffocating the sector's prosperity. Though numerous constraints were itemised to confront the sector, Moreau and Garaway (2021) informed that plenty of entrepreneurial opportunities for fish traders, including generating incomes, are available in the fish trade. Fish export is another entrepreneurial opportunity for local/regional trade and the potential growth of local and international markets in terms of fish export, contributing to export earnings and overall business growth and development (UNACTAD, 2018).

Following URT (2021) concerning the number of fishers, the Mwanza region has an enormous amount of fishers, which sums to 45.7 per cent, while the Kagera region is the second having the biggest number of fishers has 22.4 percent, statistically Mwanza region is interpreted as having then two times the sum of fishers in Kagera region. Notwithstanding these available opportunities, the number of fishers in the Misungwi and Magu districts is still small compared to the rest of the districts in rural Mwanza.

Statistically, URT (2021) informed that fishers and fish traders in Misungwi district count the smallest number of 965, equivalent to 2.06 percent of fishers and fish traders, while 1,445, equivalent to 3.09 per cent of fishers and fish traders, are found in Magu district. Comparatively to these districts, Sengerema was next to Magu district with a population of 4,414, equivalent to 9.44 percent of fishers and fish traders, followed by Buchosa district with 13, 978 equivalent to 29.88 percent of fishers and fish traders and the leading district being Ukerewe with 18,734 equivalents to 40.05 per cent.

The statistics from Misungwi and Magu districts further posed a puzzle; despite such districts having the fewest fishers and fish traders listed from 2016 to 2021, the most significant number of fishers and fish traders dropped from the fish business, as reported 85.5 percent for Magu district, 14.9 percent for Ukerewe district, and 14.1 percent for Misungwi district (URT, 2021). The debatable reports emanating from Misungwi and Magu fish traders' statistics bring about an academic dilemma that requires an academic intervention to expose the reality.

Consequently, the research analytically compared rural fish enterprise growth between the Misungwi and Magu districts in the Mwanza region of Lake Victoria in Tanzania. Precisely, the research fulfilled objectives including (i) establishing associations between fish traders' innovation and mindset and between market orientation and risk-taking and (ii) comparatively establishing if a statistical difference exists in growth between Misungwi and Magu enterprises owned by fish traders.

## LITERATURE REVIEW

### Association between Innovation, Mindset and Enterprise Growth

The study of Oluwaseun et al. (2020) established that a positive mindset positively and significantly influenced enterprise growth in Nigeria. This suggests that for enterprises to grow truly, entrepreneurs should have a positive mindset about what they are doing regardless of their challenges. Such a positive mindset will enable entrepreneurs to think critically and formulate effective strategies that will enable them to develop a high level of resilience and perseverance.

In a similar research, Noor (2025) in Malaysia concluded that an innovative mindset moderately mediated entrepreneurial knowledge and enterprise growth, denoting that an innovative mindset is critical for firms' growth. From these results, firms should stretch to ensure that owners and employees develop innovative mindsets that will be useful in setting achievable objectives and strategies and work hard toward achieving firms' objectives.

In Zimbabwe, Muzviyo and Qutieshat (2024) stated that innovative capability through informed idea generation and the style of leadership that involves employees in decision-making positively yielded enterprises' performance. This means that innovation is a cornerstone of enterprise performance; thus, focusing on innovation is key to success.

In Egypt's higher education, El-Sayed et al. (2025) presented that an innovative mindset positively influenced career development and talent self-usefulness for students pursuing the nursing educational programme, denoting that if such students have a positive, innovative mindset will like the programme and will struggle to ensure that they achieve their goals and become valuable nurse officers to help the community in future. Generally, from the study that went under review, it is noted that innovation and a positive mindset are key pillars for enterprises' growth, and management should ensure that they are cultivated and integrated into the firms' operation ecosystems for sustainable enterprise growth.

**Association between Market Orientation, Risk Taking and Enterprise Growth**

In Indonesia, Yaskun et al. (2023) concluded that market orientation significantly influenced innovation, which later defined firms' competitive advantage and yielded firms' performance in the long run. This suggests that enterprises with market orientation can easily sense emerging opportunities and strategise how to respond to market needs with informed decisions. In related research, Arshad et al. (2024) in Pakistan exhibited that market orientation and enterprise performance were associated.

Further, market orientation was identified to be associated with entrepreneurial orientation. This means that market-oriented firms work hard to explore information about market needs. Through entrepreneurial orientation, they respond timely and effectively to the identified needs, thus acquiring and sustaining competitive advantage. Similarly, Dwumah et al. (2024) in Ghana reported that entrepreneurial orientation comprising traits for entrepreneurs being proactive, innovative, risk takers and aggressive for competitiveness exhibited significant association with enterprises' performance. Thus, firms should strive to cultivate entrepreneurial orientation among owners and employees to become results-based firms.

In China, Luo et al. (2024) established that firms embracing digital solutions in operations have taken high risks in adopting such digital solutions. However, the outcomes have been reflected in improved management capability, strategic differentiation and optimal utilisation of assets, which have resulted in firms' growth. These results inform that firms that strategically take risks to digitise their operating systems acquire a competitive advantage that helps them to win competition

and grow sustainably. Therefore, integrating market orientation and risk-taking as entrepreneurial orientation helps firms to realise growth.

**Enterprise Growth between Missungwi and Magu Fish Traders**

Missungwi and Magu districts were selected for comparative analysis since they had the smallest number of fishers and fish traders compared to other districts in the rural Mwanza region (URT, 2021). For comparative purposes, Majenga et al. (2024) adopted a t-test when comparing the performance of enterprises between the Iringa and Kilolo districts in Iringa. The test was well suited since the conditions for normal distribution were observed. Mashenene (2019) compared entrepreneurial capabilities between the Sukuma and the Chagga-owned enterprises in a related study.

Similarly, the test was well suited since the similar condition was fulfilled. Pallant (2016) presented that the t-test is a suitable statistical test if the condition for normal distribution is honoured. For independent samples t-test, the groups under comparison should be heterogeneous. In the context of the current research, an independent samples t-test was adopted as guided by the literature. Since Missungwi and Magu are different districts, they likely have different socio-cultural orientations regarding enterprise formation and management.


**METHODOLOGY**

The research occurred in the Misungwi and Magu districts in Lake Victoria, Tanzania. These districts are among seven districts of the Mwanza region that was purposefully selected based on the reason the region is leading for the most significant number of fishers counting for 45.7% compared to other regions in the Lake Zone, whereas Kagera region with 22.4% as the second region having large number of fishers followed by Mara region with 21.8% and Geita region with 8.5% while Simuyu region with 1.6%% counted for the smallest number of fishers (URT, 2021). Misungwi and Magu districts fall under selection because they have the smallest number of fishers compared to the rest of the districts in the Mwanza regions.

The actual statistics of fishers are hereunder presented as follows: Ukerewe is the district with the leading number of fishers, counting for 18,734, equivalent to 40.05% of all fishers in the region, followed by Buchosa with 13,978 fishers, equivalent to 29.88%, Sengerema with 4,414 equivalents to 9.44%, Magu with 1,445 fishers equivalent to 3.09% and Misungwi with 965 fishers equivalent to 2.06% (URT, 2021). In this research, Ilemela and Nyamagana districts were not included because they are urban districts, which was not the focus of the study. Further, the Kwimba district

was considered under exclusion criteria since the entire administrative area does not border with Lake Victoria, expressing that no practised fishing practices are going on as economic activities.

Fishers and traders, amounting to 2,410, formed the population for the research from the Misungwi and Magu districts. Misungwi district had 965 fishers and traders, equivalent to 40.04%, and Magu district counted 1,445 fishers and traders, equivalent to 59.96% (URT, 2021). The formula of Yamane (1967) was applied in the establishment of the size of the sample was made possible.

$n = N/1+N(e)^2$………………………………………………………………….…………(1)

$n = 2,410/1+2,410 (0.05)^2$

$n = 343$

A proportionate stratified sampling procedure was implemented to extract the sample size from the Misungwi and Magu districts as strata, the proportion of fishers from each district. Thus, proportionately, subsequently, to choose the last subject from the Misungwi and Magu districts for the study, simple random sampling was considered. Thus, using computations, the number of fishers and traders to be chosen from each district was calculated using the formula number of fishers and traders in each district divided by the total population (N) times sample size (n). In this case, the number of fishers and traders from the Misungwi district chosen was 137 and 206 from the Magu district, totalling 343 fishers and traders.

However, during actual fieldwork, 297 samples, equivalent to 86.6% of fish traders, were reached in the distribution of 137 from the Misungwi district and 160 from the Magu district; thus, the sample size for this research was altered to 297. The statistical Package for Social Sciences (SPSS) as a tool for data analysis opted for while the innovation gap dummy * mindset gap dummy and market orientation gap dummy* risk-taking were cross-tabulated to generate a Chi-square for measuring associations between them. Computations of independent samples t-test was carried out using continuous data of age of fish traders in years, experience of fish traders in fish business in years, startup capital in TZS, capital investment in TZS, number of employees at startup counted as persons and number of employees in 2023 counted as persons.

For statistical computations, Fisher's Exact Test, p-value, Pearson Chi-square values, frequency, percent, Nominal by Nominal Phi and Cramers' V were performed and tabulated. Crosstabs were performed to establish the values of the Person Chi-square and measure how variables are associated. The coefficients of Phi were computed to estimate the association direction amongst variables, whereas the computation of Cramer's V aimed at testing the effect size across established associations. As presented by Pallant (2016) and (Cohen, 1988), Phi coefficients vary from 0 to 1, which means that the coefficients possess larger scores communicating robust associations between variables.

The Phi coefficients are interpreted as per Cohen (1988), meaning that those with values of 0.10 signify a small-sized effect, with 0.30 values indicating a medium-sized effect, and those with 0.5 signify a large-sized effect. Cohen (1988) further interprets the negative Phi coefficient, which indicates inversely associated variables. For the case of Cramer's V coefficients, the interpretation is defined similarly to that of Phi (Pallant, 2016). The outputs emanating from crosstab, the Phi coefficients are proper in tables with 2 x 2 fashion, whereas those with larger than 2 x 2 fashion fall under Cramer's V. In the case of the current research, all tables fell under 2 x 2, and thus, the Phi coefficient was adopted to illustrate the size of the effect between associations of variables.

## Independent Samples T-test

The independent samples t-test applies to two groups of people under comparison (Pallant, 2016). In the current research, traders of fish from the Misungwi and Magu districts were assumed to be two different groups that existed and operated their businesses independently in several aspects, such as different district administrative governance, exposure, and business environment. Many preceding researchers with related research adopted independent samples t-tests to establish differences in the tested parameters between the two groups (Majenga et al., 2024; Mashenene, 2019). Before proceeding with data analysis for independent samples t-test, several tests were carried out to ascertain the appropriateness of the data for the test.

## Effect Size

After the independent samples t-test and the statistical outputs provided significant differences, Pallant (2016) and Cohen (1988) were guided to conduct further statistical analysis to estimate the effect size. The magnitude effect was estimated by computing Eta Squared as summarised in equation 2. Cohen (1988) provided how coefficients emanating from the Eta squared equation are interpreted. Cohen (1988) stipulated that the coefficient statistically measuring the size effect varies between 0 and 1. In contrast, values with Eta Squared equal to 0.01 predict the effect is small, those with 0.06 represent the size is moderate, and those with 0.14 justify the size is large.

$$EtaSquare = \frac{t^2}{t^2 + (N_1 + N_2 - 2)}$$

.................................................................................................................... (2)

Whereby:
  t = t- statistics computed
  $N_1$, $N_2$ = size of the samples for fish traders from Misungwi and Magu districts.

## FINDINGS AND DISCUSSION

### Testing for Associations between Variables

*Innovation Gap Dummy * Mindset Gap Dummy*

The results (Table 4) indicate that the Pearson-Chi-square value ($\chi 2$) was 129.910 with p-value = 0.000, which signifies the statistical presence of associations between the innovation gap dummy and the mindset gap dummy. These results imply that fish traders' mindset and innovation toward the business are associated. This further entails that fish traders must develop a positive mindset towards the business, leading to innovative thinking and actions that will enable them to improve enterprise growth.

A positive mindset will enable fish traders to work with a high level of commitment, and through innovation actively, they will be market-oriented to ensure that they penetrate the market and capture a reasonable customer base. Further, the Phi coefficient was equal to 0.661, indicating that the size of the effect between the association was considerable, as Cohen (1988) described. This indicates that cultivating a positive mindset and innovative thinking among fish traders is crucial for enterprise growth.

*Table 1: Innovation gap dummy * mindset gap dummy (n= 297)*

| Innovation gap dummy | Percent | Mindset gap dummy | | Total |
| --- | --- | --- | --- | --- |
| | | Dummy1 | Dummy2 | |
| Dummy 1 | Count | 55 | 32 | 87 |
| | % within Innovation gap dummy | 63.2% | 36.8% | 100.0% |
| | % within Mindset gap dummy | 87.3% | 13.7% | 29.3% |
| | % of Total | 18.5% | 10.8% | 29.3% |
| Dummy 2 | Count | 8 | 202 | 210 |
| | % within Innovation gap dummy | 3.8% | 96.2% | 100.0% |
| | % within Mindset gap dummy | 12.7% | 86.3% | 70.7% |
| | % of Total | 2.7% | 68.0% | 70.7% |
| Total | Count | 63 | 234 | 297 |
| | % within Innovation gap dummy | 21.2% | 78.8% | 100.0% |
| | % within Mindset gap dummy | 100.0% | 100.0% | 100.0% |
| | % of Total | 21.2% | 78.8% | 100.0% |

(Pearson Chi-Square, $\chi^2$ =129.910, df =1, p=0.000), (Fisher's Exact test p = 0.000), (Phi = 0.661, p=0.000), (Cramer's V=0.661, p=0.000), Dummy 1 = No, Dummy 2 = Yes

## Market Orientation Gap Dummy * Risk-Taking Gap Dummy

Table 2 provides a summary of the results, which indicate that the Pearson-Chi-square value ($\chi^2$) was 26.403 with p-value = 0.000, signifying the association between the market orientation gap dummy and risk-taking gap dummy was significant statistically, concluding that fish traders with the propensity of taking high risks are anticipated to have a high market orientation. This means that the association between the two variables is crucial for enterprise progress and sustainability. Thus, fish traders must take high risks, including aggressive marketing strategies. The results further inform that the association between the variables was small, as exemplified by the p-value of 0.298 (Cohen, 1988).

*Table 2: Market Orientation Gap Dummy * Risk Taking Gap Dummy (n = 297)*

| Market orientation gap dummy | Percent | Risk taking gap dummy | | Total |
|---|---|---|---|---|
| | | Dummy1 | Dummy2 | |
| Dummy 1 | Count | 59 | 28 | 87 |
| | % within Market orientation gap dummy | 67.8% | 32.2% | 100.0% |
| | % within Risk taking gap dummy | 44.4% | 17.1% | 29.3% |
| | % of Total | 19.9% | 9.4% | 29.3% |
| Dummy 2 | Count | 74 | 136 | 210 |
| | % within Market orientation gap dummy | 35.2% | 64.8% | 100.0% |
| | % within Risk taking gap dummy | 55.6% | 82.9% | 70.7% |
| | % of Total | 24.9% | 45.8% | 70.7% |
| Total | Count | 133 | 164 | 297 |
| | % within Market orientation gap dummy | 44.8% | 55.2% | 100.0% |
| | % within Risk taking gap dummy | 100.0% | 100.0% | 100.0% |
| | % of Total | 44.8% | 55.2% | 100.0% |

(Pearson Chi-Square, χ2 26.403, df =1, p=0.000), (Fisher's Exact test p = 0.000), (Phi = 0.298, p=0.000), Cramer's V=0.298, p=0.000), Dummy 1 = No, Dummy 2 = Yes

**Test for Normality**

Normality in the statistical concept designates data distribution, which is the fundamental supposition used when measuring the discrepancy of various variables. Field (2013) presented that normality supposition is imperative for the findings to arrive at a generalisation covering the entire population. The tests that measure arithmetically normality inferentially are Kolmogorov-Smirnov and Shapiro-Wilk. The spelt-out tests help to compare data normality to a normal distribution and subsequently offer direction to make objective statistical decisions. Statistically, the Kolmogorov-Smirnov test applies when the sample size is above 200, whereas Shapiro-Wilk is the appropriate test for samples extending from 50 to 2,000. Under this research, with a sample size of 297, both

tests for Kolmogorov-Smirnov and Shapiro-Wilk were relevant since they fulfilled the fundamental supposition.

The results presented in Table 3 show that the outputs of Kolmogorov-Smirnov and Shapiro-Wilk signify that the variables tested were different and significant at p < 0.000 from the normal distribution. Statistically, this implies that the variables exposed for tests were not normally distributed, disrespecting the normality supposition. Pallant (2016) contended that statistically, significant outputs are predicted for large sample sizes, such as Kolmogorov-Smirnov and Shapiro-Wilk. Nevertheless, such significant outputs from Kolmogorov-Smirnov and Shapiro-Wilk should not be understood as the deviation of data from a normal distribution (Abbasi, 2011). Consequently, the independent samples t-test was considered relevant to the available data. The study of Majenga et al. (2024) and Mashenene (2019) encountered similar outputs for the Kolmogorov-Smirnov and Shapiro-Wilk and performed independent samples t-tests with similar justification.

*Table 3: Test for Normality*

| Variables | Districts | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| Age of fish trader (years) | Misungwi | .103 | 137 | .001 | .976 | 137 | .015 |
| | Magu | .099 | 159 | .001 | .966 | 159 | .001 |
| Experience in fish trade (years) | Misungwi | .134 | 137 | .000 | .931 | 137 | .000 |
| | Magu | .167 | 159 | .000 | .866 | 159 | .000 |
| Startup capital invested (TZS) | Misungwi | .175 | 137 | .000 | .741 | 137 | .000 |
| | Magu | .382 | 159 | .000 | .252 | 159 | .000 |
| Capital invested in 2023 (TZS) | Misungwi | .281 | 137 | .000 | .279 | 137 | .000 |
| | Magu | .420 | 159 | .000 | .267 | 159 | .000 |
| Employees at startup (Persons) | Misungwi | .351 | 137 | .000 | .768 | 137 | .000 |
| | Magu | .475 | 159 | .000 | .509 | 159 | .000 |
| Employees in 2023 (Persons) | Minsungwi | .213 | 137 | .000 | .791 | 137 | .000 |
| | Magu | .279 | 159 | .000 | .677 | 159 | .000 |

*Levene's test for equality of variance*

Table 4 summarises the outputs of Levene's test that was carried out to evaluate the supposition for the variance homogeneity of the population from which the nomination of samples took place, and this test is statistical before interpreting the results of the t-test. Undertaking this test is crucial to validate the existence of equal variance (Lawson, 2014). Further, it is presented that the usefulness of this test is to answer the key concern that the t-test is not valid if this supposition is addressed (Vogt, 2005). Table 4 presents outputs indicating that the significance levels of the test for Levene for the age of fish traders were 0.031, the experience of fish traders was 0.000, startup

capital was 0.000, capital invested in 2023 was 0.000, and the number of employees at startup was 0.000. These significance levels were below 0.05, the recognised threshold; it was statistically interpreted that violation of the supposition of equal variances took place, thus compelling reporting of alternative values of t from the second line of a table, which reads as equal variances not assumed (Pallant, 2016). Only the output for some employees in 2023 was not significant (0.278) as it was larger than the threshold of 0.05, signifying that the supposition of equal variance was honoured, thus reporting a t value from the first line of a results' table was considered relevant (Pallant, 2016).

*Table 4: Levene's Test*

| Variables | Variances | Levene's Test for Equality of Variances | |
| --- | --- | --- | --- |
| | | F | Sig. |
| Age of fish traders (years) | Equal variances assumed | 4.680 | 0.031 |
| | Equal variances not assumed | | |
| Experience in fish trade (years) | Equal variances assumed | 16.864 | 0.000 |
| | Equal variances not assumed | | |
| Startup capital invested (TZS) | Equal variances assumed | 17.826 | 0.000 |
| | Equal variances not assumed | | |
| Capital invested in 2023 (TZS) | Equal variances assumed | 22.920 | 0.000 |
| | Equal variances not assumed | | |
| Employees at startup (Persons) | Equal variances assumed | 20.162 | 0.000 |
| | Equal variances not assumed | | |
| Employees in 2023 (Persons) | Equal variances assumed | 1.181 | 0.278 |
| | Equal variances not assumed | | |

**Test of Outliers**
Before further data analysis, a test for outliers was considered vital since the t-test is sensitive to outliers. The tests for outliers were performed using data from the Misungwi and Magu districts on the age of fish traders, their experience in the fish business, startup capital, capital in 2023, number of employees at startup, and number of employees in 2023. The results proved that a typical data distribution existed, entailing the absence of outliers.

**Independent Samples T-test Results**

*Age of Fish Traders*

Table 5 provides results comparing the age of fish traders between the Misungwi and Magu districts whereas the mean age of fish traders from the Misungwi district was 36.01 years, and that of fish traders from Magu was 35.69. The difference established between the two groups of fish traders was 0.32 years. In contrast, those from the Magu district were somehow younger than those from the Misungwi district, though generally, the mean ages for both districts infer that fish traders from the two districts were young. These results infer that this is the age of active persons participating in various income-generating activities such as fish trade. The difference in the results was also statistically significant (sig. < 0.05). These results relate to those of Majenga et al. (2024), who established that owners of businesses in rural Tanzania are youth with a mean age of 38.8 years, which sounds similar to the mean age in this research.

*Table 5: T-test results*

| Variables | District | n | Mean | Std. Deviation | Std. Error Mean | t |
|---|---|---|---|---|---|---|
| Age (years) | Misungwi | 137 | 36.01 | 7.249 | 0.619 | 0.329** |
| | Magu | 160 | 35.69 | 9.141 | 0.723 | |
| Experience (years) | Misungwi | 137 | 7.50 | 3.967 | 0.339 | -1.964*** |
| | Magu | 160 | 8.65 | 6.009 | 0.475 | |
| Startup capital | Misungwi | 137 | 119,927.14 | 98,367.197 | 8,404.077 | -2.967*** |
| | Magu | 160 | 506,906.31 | 1,646,123.686 | 130,137.504 | |
| Capital 2023 | Misungwi | 137 | 383,992.70 | 644,783.850 | 55,087.602 | -3.208*** |
| | Magu | 160 | 2,783,837.50 | 9,443,736.214 | 746,592.901 | |
| Employees at startup (Persons) | Misungwi | 137 | 1.45 | 0.737 | 0.063 | 2.722*** |
| | Magu | 159 | 1.24 | 0.590 | 0.047 | 0.566 |
| Employees 2023 (Persons) | Misungwi | 137 | 2.35 | 1.380 | 0.118 | |
| | Magu | 159 | 2.25 | 1.756 | 0.139 | |

Notes: *** & ** = significance level at 1% and  5% respectively

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**Experience of Fish Traders**
Table 5 indicates that the mean age regarding the experience of fish traders in the fish business was 7.50 years for the Misungwi district and 8.65 years for the Magu district, inferring that these traders were experienced enough to carry out the fish business.  The difference between the Misungwi and Mangu district's fish traders was significant statistically, indicating that the Magu districts had more experience in the fish business than those from the Misungwi district. Comparatively, fish traders from the Misungwi and Magu districts were more experienced than traders in the Iringa region (Majenga et al., 2024).

**Capital Investment**
Findings in Table 5 show a significant difference in the means of startup capital (capital in 2019) between Misungwi and Magu districts fish traders, where Magu fish traders had a mean of TZS 506,906.31 compared to TZS 119,927.14 for Misungwi fish traders. These findings imply that Magu fish traders had startup capital of 4.23 times that of Misungwi fish traders, meaning that Magu fish traders had made more considerable capital investments as startup capital compared to Misungwi fish traders.

Further, the findings show a significant difference in the means of capital in 2023 between Misungwi and Magu fish traders, where Magu fish traders had a mean of TZS 2,783,837.50 compared to that of TZS 383,992.70 for Misungwi fish traders, implying that Magu fish traders had grown capital 7.23 times than that of Misungwi fish traders. Such a significant difference in means of capital growth after five years of fish trade connotes the possibility of differences in entrepreneurial practices. The findings further show that capital growth for Magu fish traders 2019-2023 was 5.49 times (from TZS 506,906.31 to TZS 2,783,837.50), while that of Misungwi fish traders grew 3.20 times (from TZS 119,927.14 to TZS 383,992.70). Similarly, such differences in capital growth among fish traders between the two districts are likely due to differences in entrepreneurial practices.

**Number of Employees**
Table 5 shows that the difference in the number of employees between the Misungwi and Magu districts was significant statistically at sig. < 0.01, whereas Misungwi had a mean score of 1.45 persons while that of Magu district was 1.25.  These results bring about surprise as Misungwi fish traders with smaller startup capital than Magu fish traders had more considerable employment at startup. Such surprising results may be explained by the fact that fish traders at Misungwi districts lack proper staffing skills; as a result, they become overstaffed, which limits capital growth.

Similarly, after five years (2019 – 2023), Misungwi fish traders maintained a higher number of employees with a mean score of 2.35 persons compared to 2.25 persons for the Magu district,

though the difference was statistically insignificant. These surprising findings can be explained in a way that Misungwi fish traders lack innovative initiatives on the issue of staffing, which is a major expense that has hardly allowed capital growth compared to their counterpart Magu fish traders. These findings show some similarities with those of Majenga (2024), who found that the increase in the number of employees among businesses in the Iringa region was proportional to the increase in capital investment.

**Effect Size**

Table 6 summarises results from computations of Eta Squared, including all significant variables tested for independent samples t-test, namely age of fish traders, experience in fish business, startup capital, capital investment in 2023 and number of employees at startup. Pallant (2016) and Cohen (1988) concluded that further statistical analysis of Eta Squared is binding if significant outputs are found when undertaking a t-test. The results indicate that the age of fish traders, experience in the fish business and number of employees at the startup demonstrated a small effect, while the effect size for startup capital and capital invested in 2023 was moderate.

*Table 6: Eta squared coefficients*

| Variables | Eta Squared | Size effect interpretation |
|---|---|---|
| Age of fish traders (years) | 0.00 | Small |
| Experience in fish trade (years) | 0.01 | Small |
| Startup capital invested (TZS) | 0.03 | Moderate |
| Capital invested in 2023 (TZS) | 0.03 | Moderate |
| Number of employees at startup (persons) | 0.02 | Small |

**CONCLUSION AND RECOMMENDATIONS**

The findings for the association between fish traders' innovation and mindset were significant statistically. Similarly, the association between fish traders' market orientation and risk-taking yielded similar results. The findings indicated statistically significant differences between the Misungwi and Magu districts fish traders for five variables tested under t-test: the age of fish traders, experience in the fish business, startup capital invested, capital invested in 2023, and the number of employees at the startup.

However, the size of the differences as measured by eta squared informed that the size effect for the age of fish traders, experience in fish business and the number of employees at startup were small while startup capital and capital invested in 2023 exhibited moderate size effect. These

findings inform that urgent collaborative intervention by the Ministry of Industry and Trade, Ministry of Livestock and Fisheries and the College of Business Education (CBE) that provided funds for this research is required for setting up training programmes covering entrepreneurial practices such as innovation, risk-taking, market orientation and creation of positive mindset toward fish business.

Nevertheless, the training schedule should start with fish traders in the Misungwi district, given that fish traders in Misungwi district have demonstrated lower enterprise growth than those from the Magu district. Surprisingly, while the performance of the enterprises owned by Misungwi fish traders was lower than that of those from the Magu district, the number of employees for Misungwi traders was larger than that of Misungwi fish traders. Such surprising results call upon urgent training programmes geared to assist Misungwi fish traders with proper staffing strategies and digital applications in doing business that will overcome the overstaffing problem.

The training programmes should also cover financial management and marketing skills that will enable fish traders to properly manage business finance and perform aggressive marketing to ensure they penetrate the market and expand their customer base while observing customer satisfaction as a cornerstone of any business.

Future research recommendations include undertaking a qualitative study to explore the causes of the disparity in enterprise growth between Misungwi and Magu district fish traders and extending the comparative study across regions to establish the existence of disparities that will inform policymakers to strategize for quick intervention.

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