

Profitability of Agricultural Micro and Small-Scale Enterprise in North Wollo Zone, Amhara Regional State, Ethiopia

Ebrahim Endris (✉ ebrahime3238@gmail.com)

Woldia University <https://orcid.org/0000-0002-9048-2351>

Andualem Kassegn

Woldia University

Research

Keywords: Enterprise, Micro Enterprise, Performance, Profitability, Small Enterprise

Posted Date: June 13th, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1737708/v1>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

The contribution of micro and small enterprises is limited as the majority are financially constrained and half of them dropout from business in 2014/15 from Amhara Region. Therefore, this study aimed to analyze the profitability of agricultural micro and small-scale enterprises in North Wollo Zone, Amhara Regional State, Ethiopia. Primary data was collected from 271 sample enterprises, key informants, and focus group discussions. The study employed descriptive and econometrics models for the data analysis. The financial ratio shows that the return on asset, return on owner equity and net profit margin were 0.1601, 0.2768, and 0.1520 birr, respectively. The result of the probit model estimation shows that 6 variables, namely enterprise age, manager education level, credit use, input availability, owners' aspiration, and frequency of extension contact significantly and positively influenced the probability of MSEs being profitable. The second hurdle model, the truncation model showed that enterprise age, manager education level, record keeping, access to input, and frequency of extension contact significantly affected the extent of agricultural MSEs' profitability. Therefore, enhancing knowledge, skill, and aspirations of enterprise owners, improving financial access and outreach, providing financial bookkeeping training and practice, creating reliable integration with input producers, and frequent extension support to enhance the profitability and sustainability of enterprises.

1. Introduction

Small and Medium Enterprises (SMEs) contribute more than 50% of most African GDP (Muiruri, 2017) and 80% of jobs across the continent (Runde et al., 2021). It plays a key role in improving nutrition not only by bringing nutritious foods to markets but also through job creation and income generation (FAO, 2018). In a country like Ethiopia with a fast-growing population, proper management and efficient utilization of its workforce is a critical concern (CSA, 2018). Micro and small enterprise has generated a large share of economic growth and employment in Ethiopia. It has a great contribution in reducing unemployment and providing income to those owners and employees of MSEs (Mahmud et al., 2020), and improving the livelihood conditions of target beneficiaries (Bekele, 2017). During 2019/20 alone, 111,547 new MSEs employed about 1.6 million people and received more than Birr 7.7 billion in loans for their operations (NBE, 2020). The annual progress report of GTPII in 2012/13 indicates that over the first three years of GTPI implementation, 3.96 million jobs were created over the three years (Dom & Vaughan, 2018).

The adverse attitude toward MSEs is the main challenge due to lack of knowledge of the profit earning potential of MSEs and preference for paid employment (FMSEDA, 2011). Most graduates of vocational agriculture are less likely to establish a farm/enterprise of their own and the majority want to obtain certificates required for securing employment in paying jobs (M. Francis et al., 2019). According to (CSA, 2018), 53.8% of unemployed desire to work constrained by the shortage of capital and the other accounting 10.9% did not work due to lack of working place. The politicization of entrepreneurship; weak institutional systems, weak business development services, poor infrastructure, and youth negligence are critical barriers to youth entrepreneurship programs in Ethiopia (Ahmed & Ahmed, 2021; Kebede, 2022).

Moreover, (Wolday, 2015) found that limited access to finance, lack of production and marketing premises, and inadequate market development are the main challenges in expanding and establishing MSEs in Ethiopia.

Micro and small manufacturing enterprises accounting for 60.5% are financially constrained in Amhara region (Melesse, 2019), and half of them dropout from the business in 2014/15 (Zegeye et al., 2016). The absence of access to credit, poor market linkage, lack of working premises, and information communication technology problems are critical challenges for SMEs in Amhara Region (Youtang & Yesuf, 2021). Moreover, MSEs firms in the construction sector are relatively efficient and the lowest mean efficiency in the urban agriculture sector of East Gojjan Zone (Abebe & Zemenu, 2021). Across sectors, urban agriculture accounted the 10.5% of employment created in the Amhara region, while another subsector contributes above 20% of MSEs employment in the region (EMUDH, 2016). Agricultural MSEs account for only 9.12% of North Wollo Zone MSEs in 2018/19 (NWZVEDDO, 2019). Even though urban agriculture has played an enormous role in supplying foods and raw materials to agro-processing industries and market to their products (Daniel & Getaneh, 2016), the contribution of agricultural MSEs to employment and economy is limited, which needs empirical evidence on factors influencing profitability MSEs in the agriculture sector. Therefore, this study aimed at filling the existing empirical and research gap by identifying factors affecting the profitability of agricultural MSEs in North Wollo Zone, Amhara Regional State, Ethiopia.

The objective of the study is to analyze the profitability of agricultural micro and small-scale enterprise in North Wollo Zone, Amhara Regional State of Ethiopia.

1.2. Operational Definitions

Basic Definitions of terms used in the Study

Small and medium enterprises are defined according to size (number of employees), turnover, activity, ownership and legal status (Hussain, 2000). In Ethiopia, (FDRE, 2016; FMSEDA, 2011) define micro and small enterprises.

Enterprise

A system of carrying on a business (Collin, 2006) or a synonym for a business. (Statt, 2004)

Micro Enterprises

Enterprises employing up to 5 persons including enterprise owners and family members, with total assets of not more than ETB 100,000 for the industrial sector (including manufacturing, construction, urban agriculture, and mining) and a total assets of not more than ETB 50,000 for the service sector (retail trade, transport, hotel, tourism, and information technology and maintenance services).

Small Enterprise

Enterprises employing 6–30 persons and with a total assets of from ETB 100,001 up to ETB 1,500,000 for the industrial sector and with a total assets of at least ETB 50,001 and up to ETB 500,000 for the service sector.

Profitability

Profitability can be measured through enterprise capital stock from two perspectives. Firstly, from the capital owners' point of view, the proper measurement of profitability is profitability of equity (ROE). Secondly, since enterprises can mobilize more resources to generate income and profit through borrowing money, instead of equity, we may use profitability of assets (ROA) to measure profitability (Lu et al., 2008).

2. Research Methodology

2.1. Description of Study Area

This study was conducted in the North Wollo Zone (Fig. 1), which is part of the Amhara Regional State, Ethiopia. The zonal capital city (Woldia) is located at a distance of 521 kilometres north of Addis Ababa, the capital city of the country, and 354 kilometres from Bahir Dar, the regional city. The area coverage of the zone is 12, 172.5 km² 142,295.32 Ha and is divided into 14 districts and 5 town administrations. The study area is bordered by the South Wollo zone on the south, South Gonder on the west, wag Hemra on the north, Tigray Region on the northeast, and part of its southern border is defined by the Mille River. The total population projection of North Wollo Zone in 2017 was 1, 824, 361, of which 913,572 were male and 910, 789 were female. From these population, 270,686 were urban residents and 1,553,674 were rural population (CSA, 2013).

2.2. Types, Sources and Methods of Data Collection

In this study, both qualitative and quantitative data were collected from primary and secondary sources. Primary data was collected using pretested semistructured questionnaires designed for agricultural micro and small-scale enterprises, and checklists designed for key informants and focus group discussions. The questionnaire was pretested by experts and enterprises outside the study area and necessary modification has been made for final data collection. Finally, the questionnaire designed for the enterprise was translated into the regional language Amharic to make it clear and collect real data from respondents. In addition to face-to-face interviews with enterprises, 35 key informants were interviewed and five focus group discussions were conducted. Furthermore, secondary data was collected from enterprises' annual financial statements, reports, and business plans and different published and unpublished sources, such as North Wollo Zone enterprise directive office, woreda enterprise development office, NBE, CSA, EEA, reports, and bulletins.

2.3. Sampling Procedure and Sample Size

This study solely focused on agricultural MSEs due to the small size of agricultural MSEs and associated limited employment contribution in the study area that doubted the profitability and growth potential of the sector. The desired sample size was selected proportionally from different agricultural MSEs (dairy MSEs, animal production and fattening MSEs, poultry MSEs, fruit and vegetable production MSEs) using a simple random sampling technique.

To determine the desired number of samples from the total population, the researchers used (Yamane, 1967) sample determination formula:

$$n = \frac{N}{1 + N(e)^2} (1)$$

$$n = \frac{831}{1 + 831(0.05)^2} = 271$$

Where, n = sample size, N = the total number of agricultural MSEs in North Wollo Zone, and e is the level of precision (i.e. 5%). Accordingly, out of 831 agricultural MSEs registered in North Wollo Zone, 271 sample were selected.

Table 1
Sample size distribution

Sector	Total Population	Sample
Dairy MSEs	118	38
Animal production and fattening MSEs	450	147
Poultry MSEs	108	35
Fruit and vegetable production MSEs	155	51
Total	831	271

2.4. Methods of Data Analysis

Business performance evaluation methods can be grouped into two categories: traditional methods that are justified only by the analysis of financial indicators and modern ones that combine the company's financial and non-financial performance information that enables the evaluation of its activity both quantitatively and qualitatively (Narkunienė et al., 2018). Two different indexes of profitability are operating profit ratio and return on total assets (Cozza et al., 2011). Profit and job creation are fundamental outcomes for measuring entrepreneurial performance, especially in the context of developing countries. While profit captures the main monetary outcome of business performance, employment creation is all more socially valuable, in particular, when job opportunities are offered to external workers and not only to family members (OECD, 2017). Financial performance measures such as profitability, liquidity, and solvency ratios are expressed in monetary terms to ensure the business's

financial health and sustainability. Profitability ratios are viewed as a way to identify and measure the ability MSEs to generate a profit (Scarborough & M., 2012; Warren et al., 2013). Profitability is simply the capacity to make a profit, and a business needs to make a profit to provide a return to the investors and to grow the business. Hence, this study used Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM) ratios to examine the profitability performance of MSEs in the study area.

The econometrics model used to analyze the determinants of agricultural MSEs profitability depends on whether the dependent variables are dummy, continuous, or censored at a certain level. Ordinary Least Squares (OLS) is applicable when all enterprises are profitable (have positive returns on assets). However, in reality, SMEs may incur a loss. The double-hurdle model is a more flexible alternative than Tobit and Heckman models assuming a two-step decision is independent. Unlike in Tobit model, there are no restrictions regarding the elements of explanatory variables in each stage of the double hurdle model. The model estimation involves a probit regression and the truncated regression model to identify factors affecting profitability and extent of profitability, respectively. The two decisions also have been modelled as sequential, but most studies treat the decisions as separate (Cramer et al., 1995).

A double hurdle model was used to estimate the probability and intensity of agricultural MSEs' profitability. The dependent variable profitability is measured by return on asset (ROA), which is a limited dependent variable, i.e. some observations do not have positive returns on the asset during the survey year. As the likelihood of enterprises' profitability and extent of profitability are not necessarily made jointly and no selection bias, the Double-hurdle model was chosen over Tobit and Heckman model. The model postulates that households must pass two separate hurdles before they are observed with a positive return on assets (profitable). The first hurdle (probit model) is whether to achieve a positive return on an asset or not, and the second hurdle (truncated regression model) is deciding the level of profitability conditional on the probability of being profitable. The double-hurdle model can be specified as follows:

The first hurdle is the probability of being a profitable equation with a probit model. The model is specified as follows:

$$Y_i^* = X_i' \alpha + \varepsilon_i \quad \varepsilon_i \sim N(0, \delta^2)$$

$$Y_i = \begin{cases} 1 & \text{if } Y_i^* > 0 \\ 0 & \text{if } Y_i^* \leq 0 \end{cases}$$

When Y_i is the observed return on assets, and Y_i^* denotes the latent return on asset. The latent dependent variable that takes the value 1 if MSEs have a positive return on the asset during the survey year, 0 otherwise,

X is a vector of enterprise characteristics and α is a vector of parameters.

In the second hurdle, the truncated regression model was used to analyze factors affecting the level (extent) of MSEs' profitability. Truncated regression excludes part of the sample observation based on the

value of the dependent variable (Wooldridge, 2010). That is, the truncated regression uses observations of enterprises that have a positive return on asset. The level of enterprise profitability is modelled in a truncated regression at zero as follows:

$$Z_i^* = X_i' \beta + \mu_i \quad \mu_i \sim N(0, \delta^2)$$

$$Z_i = \begin{cases} Z_i^* & \text{if } Z_i^* > 0 \text{ and } Y_i = 1 \\ 0 & \text{Otherwise} \end{cases}$$

Where Z_i is the extent of MSEs profitability, which depends on latent variable Z_i^* being greater than zero and conditional on the probability of profitability Y_i . The error terms in the probit and truncated regression models are assumed to be independently and normally distributed.

The log-likelihood functions as the double-hurdle model that nests a univariate probit model and a truncated regression model estimated by (Cragg, 1971):

$$LL_{DoubleHurdle} = \sum_0 \ln[1 - \phi(X_i' \alpha) \Phi\left(\frac{X_i' \beta}{\sigma_i}\right)] + \sum_+ \ln[\Phi(X_i' \alpha) \frac{1}{\sigma_i} \varphi\left(\frac{Y_i - X_i' \beta}{\sigma_i}\right)]$$

Where, Φ and φ refer to the standard normal probability and density functions, respectively, X_i' represent independent variables for the Probit model and the Truncated model, α' and β' are the estimated coefficients of the explanatory variables for the probit and the truncated regression models, respectively.

2.5. Definitions and Hypotheses of Variables

2.5.1. Dependent variables

Profitability (ROA)

Return on asset ratio is used to measure the profitability of agricultural MSEs during the survey year. The ability to earn profits depends on the assets the company has available for use in its operations, without considering how the assets are financed (Warren et al., 2013).

2.5.2. Independent variables

The independent variables are those factors affecting the profitability of agricultural SMEs.

Age of the enterprise

The age of enterprises is measured by the number of years over which agricultural MSEs exist in the business until the data was collected. According to (Abraham, 2018), a long-existing business improves enterprises' financial performance. Enterprises, which stay for a long period, are expected to achieve economies of scale and generate high returns on the asset. Therefore, this variable is expected to have a positive effect on the profitability of agricultural MSEs.

Number of employees

It is a continuous variable defined as the total number of permanent employees working for the enterprise during the survey year. (Abraham, 2018) indicated that efficient use of the proper number of employees improves the financial performance of MSEs. As agricultural MSEs are labour-intensive, the larger number of employees would increase the production, growth, and profitability of enterprises. Hence, the number of employees is expected to have a positive influence on agricultural MSEs profitability.

Enterprise ownership structure

It is a dummy variable measured in terms of whether the enterprise is owned by an association or privately. It takes 1 if the enterprise is owned by a partnership /association/ and 0 otherwise. Concerning ownership structure, there are two opposite views concerning the effects on firm performance. (Dagmawit & Yishak, 2016; Shibia & Barako, 2017) showed that group ownership positively affects MSEs performance due to the ability to raise large capital to undertake the intended tasks of the enterprise, and boost risk-taking capacities (Bhaumik et al., 2016). Nevertheless, (Wolday, 2015) finding showed that cooperative owned enterprise has registered the lowest performance compared to other forms of ownership due to weak cohesiveness and lack of shared vision. Hence, the ownership structure is expected to have either positive or negative effects on the profitability of agricultural MSEs.

Education level of manager

It is a continuous variable measured in years of formal schooling of the enterprise manager attended. Entrepreneurship education can play a significant role in the establishment and survival of SMMEs (Chimucheka, 2017). Empirical evidence of (Abraham, 2018) suggested that the education level of managers increases the profitability of MSEs. Therefore, the education level of enterprise managers is hypothesized to influence the profitability of agricultural MSEs positively.

Number of training

It is a continuous variable, which refers to the number of formal training enterprises owners or employees have obtained since the startup of the business. Entrepreneurial skills and financial training enhance MSEs competitiveness, thereby improving their performance. Vocational training can help MSEs owners reduce technical inefficiency that influences the profitability of MSEs positively (Kelemu, 2018 ; Tekle et al., 2016). Therefore, the number of training is expected to have a positive effect on the profitability of agricultural MSEs.

Credit use

It is a dummy variable, which takes 1 if the enterprise used credit in their business operation and 0 otherwise. The use of credit in their business might have a positive or negative influence on the profitability of agricultural MSEs. Evidence from (Mamo, 2022) revealed that enterprises who accessed credit accumulated higher capital, high saving and created higher employment opportunities than

enterprises who do not get credit access. Access to finance influenced positively and significantly influence MSMEs' performance (Abraham, 2018; Esubalew & Raghurama, 2020). The negative effect of credit use would be due to the high credit repayment burden in case of business failure. As a result, credit use might influence the profitability of agricultural MSEs either negatively or positively.

Financial Record-keeping

A dummy variable that takes a value of one if the enterprise keeps a financial record and zero otherwise. Recording the profits and losses help MSE to monitor the progress and to make adjustments to the operations of enterprises. The adoption of a formal record-keeping and financial control system improves MSEs' performance (Kaleleoul, 2016). Hence, this variable is expected to affect the profitability of agricultural MSEs positively.

Market access

This variable is measured as a dummy variable that takes one if enterprises have a secure product market, and zero otherwise. Availability of secure and sustainable market linkage is one of the decisive factors for the sustainability of MSEs, industry performance (Ebabu Engidaw, 2021) as well as the survival of micro-enterprises (Sohns & Diez, 2018). Therefore, this variable is hypothesized to influence the profitability of MSEs positively.

Access to inputs

A dummy variable that takes a value of one if MSEs have sufficient access to input (raw materials) and zero otherwise. The existence of raw materials nearby the enterprise premise can lower the cost and increase the profitability of the business. The findings of (Getnet, 2019) indicated that the availability of raw materials influences the development of small and microenterprises. Therefore, it is hypothesized to affect the profitability of agricultural SMEs positively.

Access to infrastructure

It is a dummy variable that takes a value 1 if the enterprises have basic infrastructure access and 0 otherwise. The availability of infrastructure (water, electricity, transport systems, telecommunication services etc.) influences the productivity and financial performance of agricultural MSEs which are mostly located outside of the main urban centre. The prospect of MSEs growth was high for those MSEs that have sufficient access to infrastructure (Haftom et al., 2014). Therefore, access to infrastructure is expected to influence the profitability of MSEs positively.

Working premises

It is a dummy variable that takes a value 1 if the enterprises have a convenient working premise and 0 otherwise. The working place is crucial for the successful and sustainable growth of enterprises because it is essential in creating access to resources and markets. Enterprises with secured and convenient land

ownership as a working premise have a chance of increasing firm profit (Alene, 2020) and growing faster than their counterparts. As (Abraham, 2018), agricultural MSEs with sufficient premises in a proper location are more likely to have better financial performance than those who have no access to the premise. Hence, access to the working premise is expected to influence the profitability of agricultural MSEs positively.

Enterprise owners' aspiration

It is a dummy variable that takes a value of 1 if more than half of the enterprises owners are ambitious to realize the growth and sustainability of their business and 0 otherwise. Owners' aspirations are the key factors for the growth of enterprises as the primary motivation of youths to turn to entrepreneurship is the lack of other options to enter the labour market (Mühlböck et al., 2017). Evidence from (Mohammed, 2014) confirms that the motivation of operators positively affects the income and growth of MSEs. Therefore, owners' aspiration is expected to positively determine the profitability of SMEs.

Frequency of extension contact

It is the number of times per year enterprises received technical guidance from extension agents during the survey year. The existence of frequent extension contacts improves the knowledge and information of enterprise operators', which increases their business performance. Evidence showed that agricultural extension are playing a major role in the transfer of agricultural technologies, and the development of agricultural skills and knowledge (Altalb et al., 2015). Thus, the frequency of extension contact is hypothesized to influence the performance of MSEs positively.

Table 2
Description and hypothesis of explanatory variables

Variables	Definition of variables	Expected effect
Age of the enterprise	Continuous (years)	+ve
Number of employees	Continuous (number)	+ve
Enterprise ownership structure	Dummy (1 if association or 0 otherwise.)	+/-ve
Educational level of manger	Continuous (years)	+ve
Number of training	Continuous (number)	+ve
Credit use	Dummy (1 if credit user, 0 otherwise)	+/-ve
Financial Record-keeping	Dummy (1 if enterprise keep financial records and 0 otherwise)	+ve
Market access	Dummy (1 if enterprises have secured product market and 0 otherwise)	+ve
Access to input	Dummy (1 if MSEs have sufficient access to inputs and 0 otherwise)	+ve
Access to infrastructure	Dummy (1 if the enterprises have basic infrastructure access and 0 otherwise.)	+ve
Working premise	Dummy (1 if the enterprises have a Sconvenient working premise and 0 otherwise).	+ve
Owners' aspiration	Dummy (1 if > 50% of owners' aspire for growth and 0 otherwise).	+ve
Frequency of extension contact	Continuous (number)	+ve
Source: own summary		

3. Result And Discussion

3.1. Socio-economic Characteristics of Enterprises

The government of Ethiopia has given priority to the development and employment creation in the manufacturing sector including agriculture, which is a key in solving long-standing food insecurity challenges in the country and the foundation for agro-processing industries. The age of the agricultural MSEs in the study area ranges from one year to 9 years. From the sample respondents, 8.12% of enterprises startup a year ago during the survey, while the majority of enterprises accounting for 83.76% were aged from 2 to 5 and the other 8.12% were aged more than five years old (Table 4.1). This shows

that more than 91.88% of agricultural MSEs are young and less than five years old as there were large government interventions in youth employment creation through MSEs and youth revolving funds released recently.

Table 3
Socio-economic characteristics of agricultural MSEs

Variables	Mean	Std. Dev.	Min	Max
Age of MSEs	3.125	1.6098	1	9
Education level of MSEs manager	7.535	3.2916	1	17
Number of employee	4.295	3.8722	1	20
Startup capital (birr)	67319.37	88990.55	200	450000
Current capital (2021)	118127.3	118533.4	2800	600000
Source: Own survey (2021)				

The mean education level of enterprise managers was 7.5 years of schooling, ranging from 1 to 17 years. About 66.79% of the MSEs managers attained elementary education (from grade 1–8), 19.56% attained high school education (grade 11–12), 4.8% attained preparatory and the other 8.86% had a diploma and above certificate level of education. This shows that the majority of entrepreneurs in the agriculture sector are at the elementary education level who are school dropouts and returnees from Arab counties. The number of employees of sampled agricultural MSEs ranges from one to 20 with a mean of 4 employees. The results of the study indicated that most enterprises employed members of the business and extra employment creation for non-members were few as the small size of the enterprise restricted the capacity of enterprises for more employment creation. The result showed shows that a considerable number of enterprises accounting for 40.22% do not obtain a loan from micro-financial institutions. The mean start-up and current capital of agricultural MSEs in the study area were 67319 to 118127, respectively.

The financial ratios for each agriculture subsector enterprise were computed in Table 3 Below. The result showed that the mean return on asset, return on equity, and net profit margin of agricultural enterprises in the study was 0.1601, 0.2768, and 0.1520 birr per each birr of investment and sales respectively. The minimum ratios, which are indicated by a negative value, represent the financial ratio of non-profitable agricultural enterprises during the survey year.

Table 4
Financial ratio of agricultural MSEs

Ratios	All MSEs (n = 271)				MSEs ROA > 0 (n = 191)		MSEs ROA ≤ 0 (n = 80)	
	Mean	Std.	Min	Max	Mean	Std.	Mean	Std.
ROA	0.1601	0.1772	-0.5983	0.7384	0.2452	0.1166	-0.0431	0.1237
ROE	0.2768	0.3363	-0.8	2.7425	0.413	0.2981	-0.0483	0.1446
NPM	0.1520	0.1966	-0.7797	0.8478	0.2359	0.1514	-0.0484	0.1385

Source: Own survey (2021)

3.2. Econometrics Result

The study evaluated the performance of agricultural MSEs in North Wollo Zone, Amhara Regional State, Ethiopia. The financial performance of agricultural MSEs is evaluated through profitability, which is measured by the return on assets.

Factors affecting enterprise profitability

In this section, the factors affecting profitability and the extent of profitability estimates are presented with the application of the double hurdle regression model. Model appropriateness tests were performed using the log-likelihood ratio test, Akaike's Information Criteria (AIC) and Bayesian information criterion (BIC). The result indicates that double hurdle regression is the right model over Tobit regression, with log-likelihood ($\Gamma = 553.92823$) higher than the chi-square value (24.99) at 15 degrees of freedom and at 1% significance level. The dependent variable return on asset (ROA) which is used to measure profitability which is limited as some enterprises are profitable while some are not during the survey year 2020/2021. Hence, the first stage of the hurdle model uses the probit model to analyze the probability of enterprises being profitable (positive returns on assets) and the second stage of the hurdle model uses truncated regression to estimate factors affecting the extent of profitability (amount of return on assets) by truncating enterprises that are not profitable during the survey year.

The probit regression model chi-square test indicates that the overall goodness-of-fit of the probit model was statistically significant at 1% probability level. The result of the probit model estimation shows that 6 variables (enterprise age, manager education level, credit use, access to input, owners' aspiration, and frequency of extension contact) significantly and positively influenced the probability of MSEs being profitable (Table 12). The second hurdle model, the truncation model, was statistically significant at 1% significance level that shows the goodness of fit of the model to explain the effects of the hypothesized variables on the dependent variable (extent of profitability). The truncated regression results revealed that enterprise age, manager education level, record keeping, input access, and frequency of extension contact significantly affect the extent of agricultural MSEs profitability.

Table 5
Double-hurdle estimates of profitability and level of profit of agricultural MSEs.

Variables	Probit regression			Truncated regression	
	Coefficient	Std. Err	dy/dx	Coefficients	Std. Err.
Manger education level	0.295***	0.104	0.0324	0.009*	0.005
Ownership structure	0.215***	0.08	0.0237	0.017***	0.004
Number of employee	0.352	0.348	0.0373	0.027	0.02
Number of training	0.055	0.045	0.006	0.0005	0.003
Credit use	-0.012	0.197	-0.0013	-0.013	0.01
Record keeping	1.505***	0.316	0.2270	-0.02	0.022
Market access	0.83	0.594	0.0808	0.047**	0.021
Access to input	0.424	0.323	0.0531	-0.01	0.019
Access to infrastructure	0.613*	0.349	0.0631	0.03*	0.017
Working premise	0.437	0.301	0.05	-0.008	0.017
Owners' aspiration	0.493	0.344	0.0664	0.008	0.025
Extension contact	0.709**	0.312	0.1072	-0.007	0.024
Manger education level	0.701**	0.291	0.0771	0.02*	0.012
Constant	-5.509	0.864	-	0.019	0.051
Sigma				0.1***	0.006

Age of enterprise

The age of agricultural MSEs positively affects the profitability and extent of profitability at 1% and 10% significance level, respectively. The result indicates that a year increase in the age of agricultural MSEs increases the probability of profitability by 3.24% and returns on asset by 0.9%, respectively. This finding is in line with that of firm age has a substantial effect on firm performance (Mallinguh et al., 2020) and an indirect effect on performance through intelligence generation (Doucouré & Diagne, 2020).

Manger educational level

The education level of the enterprise manager positively and significantly affected both the profitability and extent of profitability at 1% significance level. The result shows that a year increase in managers' education level increases profitability by 2.37% and return on the asset by 1.7%, holding other factors constant. Education widens the scope of perception and enhances an individual's ability to perform tasks efficiently (Bosire & Etyang, 2003). Transformational leadership, competencies in entrepreneurship and

technical expertise obtained through education offer the best chance for business success (Song et al., 2016), marketing performance (Afriyie et al., 2019), and agribusiness financial performance (Abraham, 2018; Jankelová et al., 2020). Manager's financial literacy has a direct positive significant influence on the performance of SMEs such as promoting efficiency and increasing market share and sales profit (Agyapong & Attram, 2019). Education level of entrepreneurs positively influenced net profit (Gichuki et al., 2014) and SMEs profitability (Njanike, 2020).

Credit use

The use of credit positively and significantly affected the probability of profitability at 1% significance level. The result of this study indicates that the use of credit increases the profitability of agricultural MSEs by 22.7%, holding other factors constant. This indicates that credit increases enterprise capital that helps to achieve economies of scale and undertake the required enterprise tasks. The finding aligns with the significant positive relationship between financial adequacy and profitability of SMEs (Kehinde et al., 2017).

Financial Record Keeping

Financial record-keeping has a significant and positive effect on the extent of enterprise profitability at 5% significance level. The result indicates that keeping enterprise financial records increases agricultural MSEs returns on the asset by 4.7%, keeping other factors constant. Record-keeping practices have a significant effect on micro enterprises' performance (Adeoti & Asabi, 2018). The application of a good accounting system (Kehinde et al., 2017) and working capital management has a positive impact on SMEs' profitability (Benard & Ainomugisha, 2019). In addition, mental budgeting has a significant influence on the financial management of SMEs (Hoque & Ulku, 2017).

Access to input

Access to input (raw materials) has positively and significantly influenced both the profitability and extent of profitability of agricultural MSEs at 10% significance level. The result shows that access to a reliable market increases the profitability of agricultural enterprises by 6.31% and returns on asset by 3%, respectively. The study finding is consistent with that input supply affect the performance of micro and small enterprise in east Amhara (Mengstie, 2016) and significantly influence the profitability of MSEs (Abebe, 2018). Outsourcing primary activities has a significant effect on the organizational profitability of SMEs (Agburu et al., 2017).

Owners' aspiration

Agricultural enterprise owners' aspirations significantly and positively influence the profitability of enterprises at 1% significance level. The result shows that enterprise owners' aspirations in achieving their business growth and sustainability increase the likelihood of enterprise profitability by 10.72%, holding other factors constant. This finding is consistent with (Laguir & Den Besten, 2016) who founds that entrepreneurial spirit motivation is a cornerstone to MSEs' growth. Psychological capital and social

competence are specifically important resources for entrepreneurial success and enable entrepreneurs to flourish despite the challenges (Baluku et al., 2018).

Frequency of extension contact

It has a positive and significant effect on both profitability and extent of profitability at 5% and 1% significance level. The result shows that a unit increase in the frequency of extension contact increases profitability by 7.71% and returns to asset by 2%, holding other factors constant. The finding is in line with the findings of (Akinagbe et al., 2013) who revealed that agricultural extension services keep users updated with new knowledge and skills to address the emerging challenges (Maulu et al., 2021). Hence, the agricultural extension programme improves welfare through an increase in farmers' income (Danso-Abbeam et al., 2018).

4. Conclusion And Recommendation

With a fast-growing population in Ethiopia, MSEs development has given extensive attention to create jobs and foster the economic development of the country. However, the pursuit of entrepreneurship often comes with high stress, multiple obstacles, and high levels of uncertainty regarding outcomes, which limit their contribution to national income, employment, and export performance. Financial constraint is the most critical bottleneck to startup a new business, and 53.8% of unemployed desire to work constrained by the shortage of capital, while 10.9% of them are due to lack of working place. The performance of urban agriculture in terms of job creation and growth level is very restrictive compared to service and manufacturing MSEs. Despite North Wollo Zone having a high potential for agriculture, the contribution of agricultural MSEs to employment and the economy is limited, which needs empirical evidence to evaluate the profitability factors that hinder the development of MSEs in the agriculture sector. Therefore, this study aimed to investigate the profitability of agricultural MSEs in North Wollo Zone, Amhara Regional State, Ethiopia.

The study collected qualitative and quantitative data from primary and secondary sources. Through random sampling techniques, out of 831 agricultural MSEs registered in North Wollo Zone, 271 sample were selected proportional to the enterprises in each subsector. Profitability ratios such as return on asset, return on equity, and net profit margin were used to examine the financial performance of MSEs in the study area. A double hurdle model was used to estimate the probability and level of agricultural MSEs profitability (return on asset) as the dependent variable, which is a limited dependent variable and two decisions are not necessarily made jointly and there was no sample selection problem in the model. The result showed that the mean return on asset, return on equity, and net profit margin of agricultural enterprises in the study were 0.1601, 0.2768 and 0.1520 birr per each birr of investment and sales respectively. The mean age of the agricultural MSEs and manager education level were 3 and 7.5 respectively. Of the sample respondents, 8.12% of enterprises startup a year ago during the survey while the majority of enterprises accounting for 83.76% were aged from 2 to 5 years old. The result of probit model estimation shows that age of enterprise, manager education level, credit use, access to input,

owners' aspiration, and frequency of extension contact significantly and positively influenced the probability of MSEs being profitable. The second hurdle model, the truncation model showed that age of enterprise, enterprise manager education, record keeping, access to input, and frequency of extension contact significantly influenced the extent of agricultural MSEs profitability.

Based on the findings of this study, the following recommendation is provided for the respective concerning body to enhance the profitability and financial performance of agricultural MSEs in the study area as well as national sector development.

- Education level was found to affect the profitability of agricultural MSEs in the study area. Hence, enhancing enterprise knowledge and skills, and owners' aspirations through skill development training and youth education program are vital for the profitability of the enterprise, thereby developing the sector.
- Credit use has a significant affects on the profitability of agricultural MSEs in the study area. Hence, the financial sector and the government should consider unlocking the financial challenges through MSEs targeting loans, and improving financial outreach.
- Financial record keeping affects the profitability of agricultural MSEs. Hence, enterprise development offices and lending institutions should provide basic financial skill training and monitor the financial bookkeeping practice of the enterprises.
- Input access significantly affected the profitability of enterprises in the study area. Therefore, creating a reliable input linkage for agricultural MSEs for which their products are perishable and have seasonal production schedules is critical to the development of the sector.
- The frequency of extension contact positively affected the profitability of enterprises in the study area. Hence, great attention should be given to frequent extension monitoring and advice to the enterprises.

Abbreviations

ACSI
Amhara Credit and Saving Institution
MSEs
CSA:Central Statistical Agency
Micro and Small-scale Enterprises
MSMEs
Micro, Small and Medium Enterprises
MFI
Micro-Finance Institutions

Declarations

Competing interests

The authors declare that they have no competing interests

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Code availability

Not applicable

Authors' contributions

All authors participated in the entire process of the research and write up. All authors read and approved the final manuscript.

Funding

Woldia University

References

1. Abebe, A. (2018). Problems and Prospects of Entrepreneurial Activity in Relation to Micro and Small Scale Enterprises in Ethiopia. *International Journal of Research in Engg & Mgmt*, 2(4), 114–122
2. Abebe, B. A., & Zemenu, A. A. (2021). Efficiency of Micro and Small Enterprises in Ethiopia: Evidence from Data Envelope Analysis Model. <https://doi.org/10.20944/preprints202110.0180.v1>
3. Abraham, A. (2018). Financial Performance of Agricultural Enterprises and Their Determinant Factors in Hadiya Zone. *Ethiopia European Journal of Business and Management*, 10(19), 25–34
4. Adeoti, J. O., & Asabi, M. O. (2018). Effect of Record Keeping Practices on the Performance of Micro Enterprises in Lagos State, Nigeria
5. niversity of Ilorin, Nigeria. *Amity Journal of Corporate Governance*, 3 (2), 1–10
6. Afriyie, S., Du, J., & Ibn Musah, A. A. (2019). Innovation and marketing performance of SME in an emerging economy: the moderating effect of transformational leadership. *Journal of Global Entrepreneurship Research*, 9(1), <https://doi.org/10.1186/s40497-019-0165-3>
7. Agburu, J. I., Anza, N. C., & Iyortsuun, A. S. (2017). Effect of outsourcing strategies on the performance of small and medium scale enterprises (SMEs). *Journal of Global Entrepreneurship Research*, 7(1), <https://doi.org/10.1186/s40497-017-0084-0>
8. Agyapong, D., & Attram, A. B. (2019). Effect of owner-manager's financial literacy on the performance of SMEs in the Cape Coast Metropolis in Ghana. *Journal of Global Entrepreneurship Research*, 9(1), <https://doi.org/10.1186/s40497-019-0191-1>

9. Ahmed, H. M. S., & Ahmed, Y. A. (2021). Constraints of youth entrepreneurs in Ethiopia. *Journal of Global Entrepreneurship Research*. <https://doi.org/10.1007/s40497-021-00292-z>
10. Akinagbe, O. M., Ukaegbu, E. O., & Saddiq, O. A. B. (2013). Role of agricultural extension services in generation and dissemination of agricultural biotechnology in Abia State, Nigeria. *African Journal of Biotechnology*, *12*(6), 554–562. <https://doi.org/10.5897/AJB12.1983>
11. Alene, E. T. (2020). Determinants that influence the performance of women entrepreneurs in micro and small enterprises in Ethiopia. *Journal of Innovation and Entrepreneurship*, *9*(1), <https://doi.org/10.1186/s13731-020-00132-6>
12. Altalb, A. A. T., Filipek, T., & Skowron, P. (2015). The Role of Agricultural Extension in the Transfer and Adoption of Agricultural Technologies. *Asian Journal of Agriculture and Food Sciences*, *3*(5), 500–507
13. Baluku, M. M., Kikooma, J. F., Bantu, E., & Otto, K. (2018). Psychological capital and entrepreneurial outcomes: the moderating role of social competences of owners of micro-enterprises in East Africa. *Journal of Global Entrepreneurship Research*, *8*(1), <https://doi.org/10.1186/s40497-018-0113-7>
14. Bekele, M. (2017). Micro and Small Enterprises as an Anti-Poverty and Employment Generation Strategy in Bahir Dar City. *North-Western Ethiopia Poverty & Public Policy*, *9*(3), 258–275
15. Benard, N., & Ainomugisha, A. (2019). Financial Management and Profitability among Small and Medium Enterprises (SMEs) in Uganda. *International Journal of Research and Innovation in Social Science*, *III*(VII), 606–615
16. Bhaumik, S. K., Estrin, S., & Mickiewicz, T. (2016). Ownership identity, strategy and performance: Business group affiliates versus independent firms in India. *Asia Pacific Journal of Management*, *34*(2), 281–311. <https://doi.org/10.1007/s10490-016-9477-9>
17. Bosire, J., & Etyang, M. (2003). The Effect of Education on Business Skills Cognition: the case of indigenous microscale enterprise owners in Kenya. *Journal of Vocational Education and Training*, *55*(1)
18. Chimucheka, T. (2017). The Impact of Entrepreneurship Education on the Establishment and Survival of Small, Micro and Medium Enterprises (SMMEs). *Journal of Economics*, *4*(2), 157–168. <https://doi.org/10.1080/09765239.2013.11884975>
19. Collin, P. (2006). *Dictionary of Business* (4th Edition ed.). A & C Black Publishers Ltd
20. Cozza, C., Malerba, F., Mancusi, M. L., Perani, G., & Vezzulli, A. (2011). Innovation, profitability and growth in medium and high-tech manufacturing industries: evidence from Italy. *Applied Economics*, *44*(15), 1963–1976. <https://doi.org/10.1080/00036846.2011.556594>
21. Cragg, J. G. (1971). Some Statistical Models for Limited Dependent Variables with Application to the Demand for Durable Goods.. *Econometrica*, 829–844. <https://doi.org/http://dx.doi.org/10.2307/1909582>
22. Cramer, G. L., Gao, X. M., & Wailes, E. J. (1995). Double-hurdle Model with Bivariate Normal Errors: An Application to U.S. Rice Demand. *J. Agr. and Applied Econ.*, 363–376

23. CSA (2013). *Population Projection of Ethiopia for All Regions At Wereda Level from 2014–2017*. F. D. R. o. Ethiopia
24. CSA (2018). *key findings on the 2018 urban employment unemployment survey (With Comparative Analysis to 2012 and 2014–2016 Survey Results)*..
25. Dagmawit, A., & Yishak, G. (2016). Determinants of Micro and Small Enterprises Growth: The Case of Durame Town, Kembata Tembaro Zone, Southern Nations and Nationalities and Peoples Region, Ethiopia, 2016. *International Journal of Business and Economics Research*, 5(5), <https://doi.org/10.11648/j.ijber.20160505.15>
26. Daniel, T., & Getaneh, S. (2016). Determinates of Employment Generation through Urban Agriculture: The Case of Bishoftu Area of Oromia Region, Ethiopia. *International Journal of African and Asian Studies*, 26, 49–55
27. Danso-Abbeam, G., Ehiakpor, D. S., & Aidoo, R. (2018). Agricultural extension and its effects on farm productivity and income: insight from Northern Ghana. *Agriculture & Food Security*, 7(1), <https://doi.org/10.1186/s40066-018-0225-x>
28. Dom, C., & Vaughan, S. (2018). *WIDE Bridge - Policy review*
29. Doucouré, B., & Diagne, A. (2020). The effect of size and age on the performance of Senegalese small food companies: the role of market orientation. *Transnational Corporations Review*, 12(4), 1–11. <https://doi.org/10.1080/19186444.2020.1832426>
30. Ebabu Engidaw, A. (2021). The effect of external factors on industry performance: the case of Lalibela City micro and small enterprises, Ethiopia. *Journal of Innovation and Entrepreneurship*, 10(1), <https://doi.org/10.1186/s13731-021-00147-7>
31. EMUDH (2016). *Second growth and transformation plan first year 2008 year first round sectors performance report*
32. Esubalew, A. A., & Raghurama, A. (2020). The mediating effect of entrepreneurs' competency on the relationship between Bank finance and performance of micro, small, and medium enterprises (MSMEs). *European Research on Management and Business Economics*, 26(2), 87–95. <https://doi.org/10.1016/j.iedeen.2020.03.001>
33. FAO (2018). *Leveraging Small and Medium Enterprises to improve nutrition*
34. FDRE. (2016). *Federal Urban Job Creation and Food Security Agency Establishment Council of Ministers Regulation*. Federal Democratic Republic of Ethiopia
35. FMSEDA (2011). *Micro and Small Enterprise Development Strategy, Provision Framework and Methods of Implementation*..
36. Getnet, H. K. (2019). Policy Framework of Small and Micro Enterprises and Its Role on the Development of the Sector in Bahir Dar City. *Ethiopia Public Policy and Administration Research*, 9(4), 1–8. <https://doi.org/10.7176/ppar>
37. Gichuki, C. N., Mulu-Mutuku, M., & Kinuthia, L. N. (2014). Performance of women owned enterprises accessing credit from village credit and savings associations in Kenya *Journal of Global Entrepreneurship Research*, 4(16)

38. Haftom, H., Fisseha, G., & Araya, H. (2014). External Factors Affecting the Growth of Micro and Small Enterprises (MSEs) in Ethiopia: A Case Study in Shire Indasselassie Town. *Tigray European Journal of Business and Management*, 6(34), 134–145
39. Hoque, M. Z., & Ulku, N. (2017). Mental budgeting and the financial management of small and medium entrepreneurs. *Cogent Economics & Finance*, 5(1), <https://doi.org/10.1080/23322039.2017.1291474>
40. Hussain, N. M. (2000). *Linkages between SMEs and Large Industries for Increased Markets and Trade: An African Perspective.*
41. Jankelová, N., Joniaková, Z., Némethová, I., & Blštáková, J. (2020). How to Support the Effect of Transformational Leadership on Performance in Agricultural Enterprises. *Sustainability*, 12(18), <https://doi.org/10.3390/su12187510>
42. Kaleleoul, F. (2016). Factors Influencing the Performance of Micro and Small Enterprises in Addis Ababa: A Study of Selected MSEs In. *Bole Sub City*. Ethiopia: MARY'S UNIVERSITY]. Addis Ababa
43. Kebede, G. F. (2022). Entrepreneurship and the Promises of Inclusive Urban Development in Ethiopia. *Urban Forum*. <https://doi.org/10.1007/s12132-022-09458-8>
44. Kehinde, A., Opeyemi, A., Benjamin, A., Adedayo, O., & Abel, O. (2017). Enterprise Risk Management and the Survival of Small Scale Businesses in Nigeria. *International Journal of Accounting Research*, 05(02), <https://doi.org/10.4172/2472-114x.1000165>
45. Kelemu, A. (2018). *Factors Affecting the Profitability of Micro and Small Enterprises in Agaro Town*. Jimma University, Jimma, Ethiopia
46. Laguir, I., & Den Besten, M. (2016). The influence of entrepreneur's personal characteristics on MSEs growth through innovation. *Applied Economics*, 48(44), 4183–4200. <https://doi.org/10.1080/00036846.2016.1153792>
47. Lu, F., Song, G., Tang, J., Zhao, H., & Liu, L. (2008). Profitability of China's industrial firms (1978–2006). *China Economic Journal*, 1(1), 1–31. <https://doi.org/10.1080/17538960701564833>
48. Francis, M., Ifeanyieze, O., Ikehi, F. O., Ojiako, M. E., Okadi, C. C., Nwankwo, A. O., C. U., & Ekenta, L. U. (2019). Vocational agriculture and entrepreneurship aspirations among university students in Nigeria. *International Journal of Training Research*, 17(3), 220–237. <https://doi.org/10.1080/14480220.2019.1690744>
49. Mahmud, M. A., Beyene, M. Y., & Mohammed, E. (2020). The Role of Micro and Small Enterprises in Employment Creation and Income Generation in Samara-Logia Town, Afar Regional State. *Management*, 10(1), 8–22. <https://doi.org/10.5923/j.mm.20201001.03>
50. Mallingu, E., Wasike, C., & Zoltan, Z. (2020). The Business Sector, Firm Age, and Performance: The Mediating Role of Foreign Ownership and Financial Leverage. *International Journal of Financial Studies*, 8(4), <https://doi.org/10.3390/ijfs8040079>
51. Mamo, W. B. (2022). Growth Determinants of Micro and Small Enterprises (MSEs): Evidence from Entrepreneurs in the Eastern Region of Ethiopia. *Journal of the Knowledge Economy*. <https://doi.org/10.1007/s13132-021-00859-x>

52. Maulu, S., Hasimuna, O. J., Mutale, B., Mphande, J., & Siankwilimba, E. (2021). Enhancing the role of rural agricultural extension programs in poverty alleviation: A review. *Cogent Food & Agriculture*, 7(1), 1–13. <https://doi.org/10.1080/23311932.2021.1886663>
53. Melesse, W. E. (2019). Change in employment level and financial constraint: evidence from Ethiopian manufacturing SMEs. *Journal of Social and Economic Development*, 21(2), 329–352. <https://doi.org/10.1007/s40847-019-00082-0>
54. Mengstie, B. (2016). Impact of Business Development Services on Performance of Micro and Small Enterprises in East Amhara Region of Ethiopia. *European Journal of Business and Management*, 8(4), 179–187
55. Mohammed, A. (2014). Constraints and Growth Potentials of Micro and Small Enterprises: Case from Mekelle City. *Journal of Economics and Sustainable Development*, 5(24), 133–139
56. Mühlböck, M., Warmuth, J. R., Holienka, M., & Kittel, B. (2017). Desperate entrepreneurs: no opportunities, no skills. *International Entrepreneurship and Management Journal*, 14(4), 975–997. <https://doi.org/10.1007/s11365-017-0472-5>
57. Muiruri, S. (2017). African small and medium enterprises (SMEs) contributions, challenges and solutions. *European Journal of Research and Reflection in Management Sciences*, 5(1), 36–48
58. Narkunienė, J., Ulbinaitė, A., & Tvaronavičienė, M. (2018). Comparative analysis of company performance evaluation methods. *Entrepreneurship and Sustainability Issues*, 6(1), 125–138. [https://doi.org/10.9770/jesi.2018.6.1\(10\)](https://doi.org/10.9770/jesi.2018.6.1(10))
59. NBE (2020). *Annual report 2019/20*
60. Njanike, K. (2020). The Factors Influencing SMEs Growth in Africa: A Case of SMEs in Zimbabwe In *Regional Development in Africa*
61. NWZVEDDO (2019). *North Wollo Zone Vocational and Enterprise Development Directive Office, Annual Report*
62. OECD. (2017). *Unlocking the potential of youth entrepreneurship in developing countries: From subsistence to performance, development Centre studies*. O. Publishing
63. Runde, D. F., Savoy, C. M., & Staguhn, J. (2021). *Supporting Small and Medium Enterprises in Sub-Saharan Africa through Blended Finance*
64. Scarborough (2012). & M., N. *Effective small business management: an entrepreneurial approach* (10th ed ed.)
65. Shibia, A. G., & Barako, D. G. (2017). Determinants of micro and small enterprises growth in Kenya. *Journal of Small Business and Enterprise Development*, 24(1), 105–118. <https://doi.org/10.1108/jsbed-07-2016-0118>
66. Sohns, F., & Diez, J. R. (2018). Explaining micro-enterprise survival in rural Vietnam: a multilevel analysis. *Spatial Economic Analysis*, 1–21. <https://doi.org/10.1080/17421772.2019.1535184>
67. Song, H., Kee, D., & Ramayah, T. (2016). The role of transformational leadership, entrepreneurial competence and technical competence on enterprise success of owner-managed SMEs. *Journal of*

General Management, 42, 23–43. <https://doi.org/10.1177/030630701604200103>

68. Statt, D. A. (2004). *The Routledge Dictionary of Business Management* (3rd Edition ed.). Routledge
69. Tekle, L., Sandraa, R., & Berhanu, K. (2016). Determinant of Technical Efficiencies of Micro and Small Enterprises in Wolaita Zone, Ethiopia. *Journal of Economics and Sustainable Development*, 7(21), 70–81
70. Warren, C. S., Reeve, J. M., & Duchac, J. (2013). *Financial and Managerial Accounting* (12 Edition ed.). Cengage Learning
71. Wolday, A. (2015). Growth of Youth-owned MSEs in Ethiopia: Characteristics, Determinants and Challenges. *Ethiopian Journal of Economics*, XXIV(2), 93–128
72. Wooldridge, J. M. (2010). *Introductory Econometrics, a Modern Approach, Instructor's manual* (3rd Edition., ed.). Cengage Learning
73. Yamane, T. (1967). *Statistics, an Introductory Analysis* (2nd Edition ed.). Harper and Row
74. Youtang, Z., & Yesuf, A. E. (2021). Driving Model of Determinant Factors Affecting the Performance of Small and Micro Enterprises: Empirical Evidence from Amhara Region, Ethiopia. <https://doi.org/10.20944/preprints202103.0106.v2>
75. Zegeye, M., Cherkos, T., Tilahun, S., & Haque (2016). An Integrated approach model for MSEs development in Amhara Region. *International Journal of Applied Theoretical Science and Technology*, 3(11)(4), 2015–2023

Figures

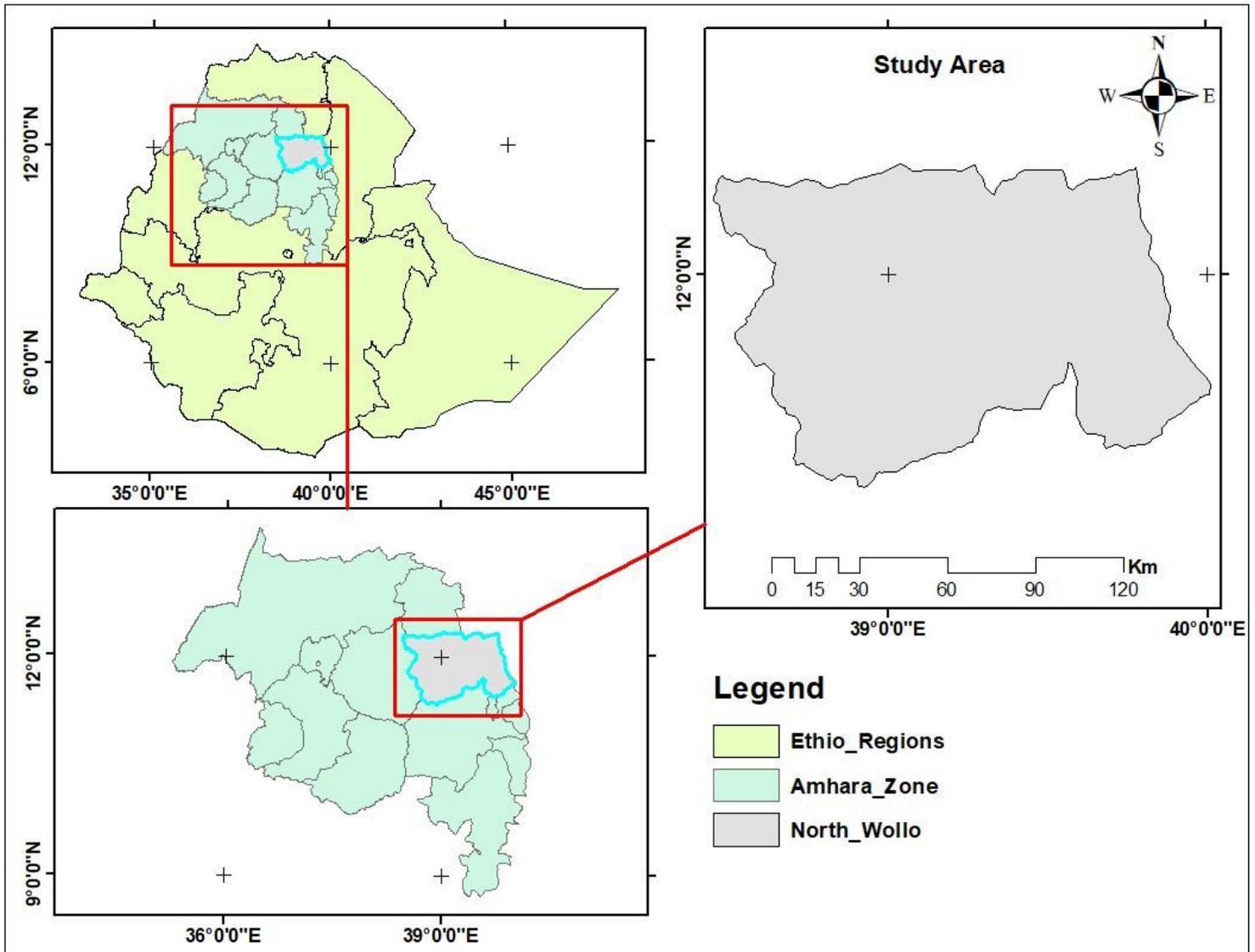


Figure 1

Study area map

Source: Google map