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Evaluating Household Determinants in Accessing Resource Bases and Enhancing Capabilities in East Wallaga Zone, Southwest Ethiopia

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Abstract

This study looks at the variables that affect households' access to livelihood resources and capacities in the East Wallaga Zone of Southwest Ethiopia, a region that is impacted by shocks brought on by conflict and climate unpredictability. Descriptive statistics, chi-square tests, one-way ANOVA, and binary logistic regression were used to analyze data from 400 rural homes scattered over highland, mid-altitude, and lowland zones. The dependent variable in the binary logit model indicated whether families had access to resources that improved their capacities (1) or not (0). Key findings indicate that the following factors greatly boost resource accessibility: irrigation, fertilizer use, family size, education level, cooperative participation, and credit availability. Depending on the agro ecological zone, factors including dependency ratio, land size, and age had varying effects. n order to increase household resilience, the study emphasizes the necessity of initiatives that improve financial inclusion, education, agricultural inputs, and cooperative membership. These results imply that specific interventions that target these factors can improve the livelihoods and adaptability of rural households in regions impacted by war and climate change. For policymakers and development professionals looking to create successful interventions in areas with limited resources and high vulnerability, this research offers insightful information.

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INTRODUCTION

Productive resources like land and water are essential for households whose livelihoods rely on the production of crops and livestock. However, accessing these resources is becoming more challenging for many low-income households in rural areas of developing countries, like Ethiopia. Small-scale farmers confront numerous challenges, including limited financial resources, high transaction costs brought on by poor infrastructure, and ambiguity surrounding land and water tenure (Mutea et al., 2020). Additionally, the

intricacies of the long-standing social and economic issues of developing nations like Ethiopia were made worse by the unpredictable environment and frequent conflicts. (Nigussie et al., 2021).

Poverty has always been determined by household income and expenses. Earnings alone, however, are not a perfect indicator of household prosperity(Coccia, 2023). Numerous factors, including as susceptibility to catastrophic risks, limited access to essential services, and a lack of fundamental capabilities like social safety nets, healthcare, and education, can contribute to household poverty (Ayal, 2022)

A household's degree of well-being may be significantly influenced by asset ownership, according to recent studies, and definitions of poverty are increasingly encompassing variables other than financial status. In order to create well-being, both are a "stock of productive, social, and locational resources." Economic theory views household assets as drivers of sustainable growth, which enhances economic, social, political, psychological, and intergenerational outcomes(Ayal, 2022), Assets assist people attain financial well-being by generating income, building up greater inventories of assets (such cattle), balancing consumption during uncertain and challenging times, and promoting resilience in the face of external shocks. Along with these monetary benefits, they also have favourable societal and individual outcomes, like improved health, education, political participation, and outlook on the future(Nigussie et al., 2021).

However, the ability of impoverished households to fully benefit from asset ownership is typically hampered by low asset quality and quantity as well as unfavourable environmental restrictions including inadequate public infrastructure and remoteness from markets. This has an impact on both their long-term development and the end of poverty. Because they face barriers when trying to access market services and financing that could help them recover, these households often turn to low-risk, low-profit endeavors in anticipation of financial losses that could impact their level of life. Vulnerable households often find themselves in a "asset poverty trap" where they are unable to increase their asset portfolios or improve their incomes. They consequently use unhealthy coping strategies to cope with shocks, such selling off priceless possessions, removing children from school, or reducing their intake of food or other essentials. The household is forced into structural and long-term poverty as a result of this outcome, which further depletes their asset portfolio.

Having access to assets can assist those in poverty rise out of poverty and accumulate a steady amount of assets. There are several ways to improve this access. Grants and asset transfers are occasionally used by governments, non-governmental organizations, and international development organizations to promote asset ownership among low-income people. However, because of their high costs and reliance on public money, asset transfer schemes, such as graduation programs, can be challenging to expand, even though their efficacy has been demonstrated (Dereje et al., 2021)

Access to different resources for their livelihoods varies from person to person. Politics, institutional setups, organizational issues, and power dynamics all play a role in this. As a result, a socially diverse approach to livelihood analysis is crucial. This entails dissecting the selected unit of analysis, such as a household, village, or community, and looking at particular social actors or groups and

their interactions regarding the different pertinent dimensions of difference (wealth, gender, age, and so on), as well as the allocation of control over resources(Singh *et al.*, 2024).

Individuals' material and social assets, both tangible and intangible, determine their capacity to use different livelihood options. These livelihood resources can be thought of as the "capital" base from which various productive activities and livelihoods are derived, to use an economic metaphor(Singh *et al.*, 2024).

The 'capital' assets that people have access to and control over must be combined in order to generate livelihoods. These could be intangible assets like access and claims, tangible assets like stores and material resources, and personal capabilities (Kassegn & Abdinasir, 2023).

Rural livelihood solutions sometimes heavily rely on natural resources(Singh *et al.*, 2024). Consequently, the Institute of Development Studies (IDS) research has examined the differences in livelihood strategy decisions across natural resource endowment gradients, from high to low (Ellis, 2000). Since they are more susceptible to natural disasters like drought, flooding, and other calamities, lower natural resource endowments increase risk and uncertainty. These locales may be riskier in relation to income than endowment locations with abundant resources, but the absolute revenue loss is usually smaller when things go wrong. Therefore, the potential size of loss and the danger of loss are two important features that distinguish these places. Along these gradients of natural resource endowment, livelihood portfolios are expected to vary. Additionally, different resource types may coexist in the same location, including hills, woods, grazing areas, dryland arable land, minor wetland patches, and irrigated areas. The variation in resource types between sites and across agroecological gradients suggests that different approaches are needed for places with different levels of natural resource endowments(Wang *et al.*, 2021).

The household is one of the primary socioeconomic units in society. It is the essential structure for creating resources, making money, and facilitating consumption. This is due to the fact that supplies needed for survival are located in the home. Only when the required resources are properly acquired and used will the household be able to endure indefinitely. However, a number of factors affect the resource bases' usability and accessibility. The underlying causes of this situation are a relative decrease in governmental power, especially at the domestic level, gender inequality, and resource scarcity. Based on variables including farm size, household composition, land fertility, off-farm income, household age, and so on, households are subsequently given the authority to access and utilize resources(Zewdie et al., 2024)

With a population of about 126.5 million as of 2023, Ethiopia is Africa's second most populous nation, behind Nigeria. With an anticipated 7.2% growth in FY2022/23, its economy is also among the fastest-growing in the region. It is one of the poorest with a gross national product of $1,020 per person. Ethiopia aspires to be classified as a lower-middle-income nation by 2025 (World Bank, 2024).

Over the past decade, persistently robust economic expansion has led to encouraging patterns in the decline of poverty in both urban and rural regions. As the percentage of persons living in poverty dropped from 30% in 2011 to 24% in 2016, metrics assessing human development also improved. Gains are negligible, though, and inequality has recently been worse as compared to other nations that

had high growth. Furthermore, the persistent conflicts in several regions of Ethiopia may jeopardise the social and economic gains Ethiopia has made (World Bank, 2024).

A 10-year development plan covering 2020–2021 and 2029–2030 has been released by the government. Its 2019 Home-Grown Economic Reform Agenda serves as its foundation. The plan aims to sustain the robust growth achieved under the Growth and Transformation Plans of the previous decade while facilitating the shift to a more private-sector-driven economy. Additionally, it aims to improve the business climate, address macroeconomic imbalances, and foster efficiency and competitiveness in the three key industries that support growth: energy, logistics, and communications (Zewdie et al., 2024).

The need to address food insecurity has grown as a result of unfavorable weather patterns, locust invasions, war, and international circumstances that cause food prices to rise sharply. Food security is also threatened by the long-term effects of climate change and the frequent occurrence of severe weather events, which affect pastoral and agricultural livelihoods. Millions of people in the southern and eastern regions of the country were negatively impacted by the 2022 drought, which was the worst in forty years. Consequently, in 2023, over 20 million individuals experienced extreme food insecurity (Bouteska *et al.*, 2024).

Ethiopia must enhance its human capital since the country's workforce is expanding—roughly 2 million people reach working age each year—and this expansion strains the labour market's ability to absorb new workers. A child born in Ethiopia today would only be 38% as productive as they could be if they had access to full education and health care, according to the Human Capital Index, which was as low as 0.38 in 2020. This is still below the norm for Sub-Saharan Africa, even if it is marginally higher than the average for low-income nations. 90% of children live in learning poverty, and 37% of children under five suffer from stunting (Bouteska *et al.*, 2024).

The Ethiopia Country Climate and Development Reports (CCDR), published in February 2024, presented data on the growing effects of climate change that jeopardize Ethiopia's chances for development. The report notes that annual average losses to gross domestic product (GDP) are expected to range between 1-1.5% and rise to 5% by the 2040s, potentially pushing millions more Ethiopians into poverty(Bouteska *et al.*, 2024).

East Wallaga's rural areas now have far higher rates of poverty as a result of persistent conflicts and climate variability. The complicated and protracted confrontations between government forces and rebel groups have resulted in a sharp fall in the standard of living for these areas. The local populace has suffered greatly as a result of the violence and instability, which has deprived them of their main source of existence. Many people have been left without the resources or opportunity to support themselves and their families as a result, which has further solidified the region's cycle of poverty and hardship (Megersa T., 2023).

The social and economic shocks have not only restricted rural households' access to resources necessary for improving their capabilities but also worsened their already poor living conditions. Basic assets that support the livelihoods of rural communities have been either destroyed or looted by informal armed fighters crossing the Abay River from the north. Additionally, ongoing

conflicts within the zone have caused people to lose their assets and, in many cases, forced them to abandon their farms, leaving their livestock to be taken by looters. The general objective of the research was to evaluate household determinants in accessing resource bases and enhancing capabilities in the East Wallaga Zone.

In addition to limiting rural households' access to resources that would enable them to improve their capacities, the social and economic shocks have made their already substandard living conditions worse. Informal armed fighters crossing the Abay River from the north have either destroyed or robbed basic assets that sustain rural populations' livelihoods. People have also lost their valuables and, in many cases, been forced to leave their farms due to persistent violence in the area, leaving their cattle vulnerable to theft by looters. The study's main goal was to assess household factors that affect the East Wallaga Zone's ability to access resources and develop capabilities.

METHODOLOGY

Study Area

The research was carried out in the East Wallaga Zone. It is one of the Oromia National Regional State's Zones, which includes 17 rural districts and 289 rural kebeles. Nekemte, the capital of the east Wallaga zone is 328 kilometers away west of Ethiopia's capital, Addis Ababa. The zone's entire land area is around 14,102.5 km2, accounting for about 3.88% of the Oromia National Regional State's overall area (Teka et al., 2022).

East Wallaga Zone is found on 8^0 31'20"N to 100 22'30"N latitude and 36° 06'00" E to 37o 12'00" E longitude. It is bordered on the North by Amhara National Regional State, on the South by Jimma zone, on the East by Horo Guduru Wallaga and West Shewa zone, on the North-West by Benishangul Gumuz National Regional State, on the West direction by West Wallaga zone, and the South-West by Buno Bedelle zone (Figure 1).

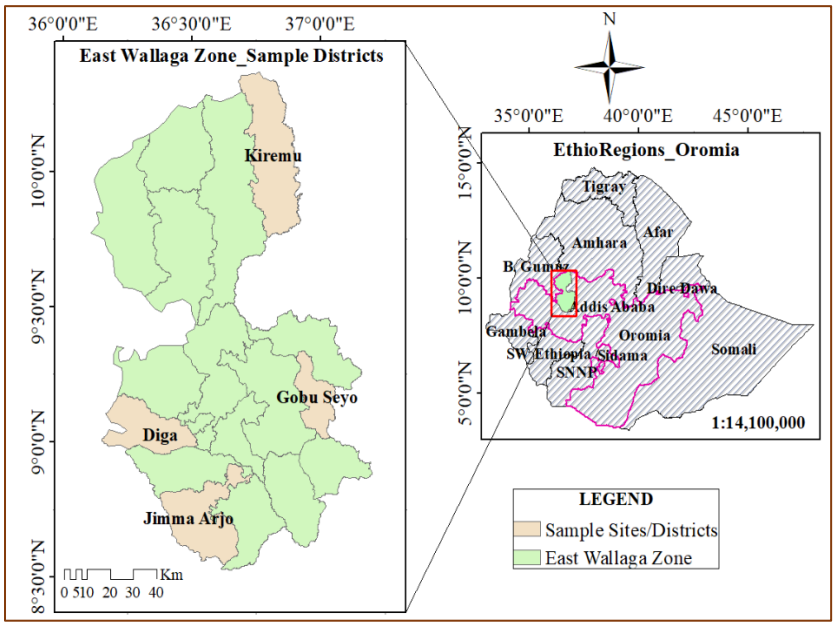

Figure 1. *Location Map of Study Area (Source: ArcGIS)*

Research Design

In order to assess the factors affecting household access to resource bases and capability upgrading, this study used a cross-sectional design. The binary logit model, which is the main analytical technique employed in this study, enables the investigation of variables that impact households' access to necessary resources that can enhance their overall capacities.

Sampling Techniques

This study employed a multi-stage sampling procedure to select sample households. In the first stage, four out of the seventeen districts in the Zone (Jimma Arjo, Diga, G/Sayo and Kiremu) were purposively selected to represent the different agro-ecological zones in the area, which influence household livelihood assets.

To calculate the sample size, the study utilized the formula provided by Kothari (2004), which is particularly suitable for a stratified sample of a finite population in the study area. This formula allowed for the determination of the required sample size from a finite population with a specific level of accuracy.

$$n = \frac{Z^2.p.q.N}{e^2\,(N-1)+Z^2.p.q} \ldots\ldots\ldots(1)$$

where z = denoted the value of the standard variation at a given confidence level, and q = 1 - p; p = 0.50 was assumed to provide the maximum sample size, resulting in q = 0.5. Z-score (1.96); n = sample size; e = the 5% (0.05) anticipated margin of error; and N represents the entire population. A 5% margin of error was used. 400 of the 7,526 homes in all Kebeles (ganda) comprised the required sample size. The sample size for each Kebele was selected based on the proportionality of the household size in each Kebele. Lastly, a random sample approach was used to choose household heads for the questionnaire.

Based on agro-ecological characteristics, kebeles (gandas) in each district were divided into lowland, midland, and highland categories in the second stage. Eight kebeles were chosen using a probability proportionate to size from each category. Sample frames, or lists of homes, were acquired from kebele administrative offices for the third stage. The probability proportional to size technique was used to draw the sample households proportionately. 400 families in all, 299 of which were headed by men and 101 by women, were selected as samples.

Data Gathering

To guarantee statistical reliability, the sample size was established at 400 using the Kothari formula. To represent a broad range of socioeconomic and demographic groups across four districts and three agro-ecological zones, stratified random sampling was used. Structured questionnaires were used to gather primary data on household-level capacities, socioeconomic status, demographics, and resource accessibility. In order to enhance the analysis, secondary data from governmental and non-governmental organizations added historical context and enhanced the original data(Kothari, 2004).

Data Analysis Techniques

Econometric models and descriptive statistics were used to analyze the data. One-way ANOVA was performed for continuous data, whereas chi-square tests, percentages, and frequencies were employed for categorical data. Interpretation and tabulation were used to analyze the qualitative data. The factors influencing household access to livelihood resources were analyzed using a binary logit model, where access was coded as 1 and no

access as 0. This model took account of how domestic and external factors affect resource accessibility, in line with Gujarati & Porter (2009). STATA version 15 was used for analysis in order to guide intervention and policy plans.

Model Specification

Both logit and probit analysis are recognised techniques for estimating dummy dependent variables in (Gecho et al., 2014; Gecho, 2017). However, when a lot of data are located close to the distribution's extremes, logit is preferred over probit (Zakari *et al.*, 2022). Furthermore, the logit model is easier to use computationally than the other type, according to Zakari *et al.*, (2022). The logit model was employed in this work to help predict the probability of a household's resource access status, which can take one of two values: access or no access (0 or 1). According to Gujarati, & Porter (2009) the functional form of the logit model like this:

$$Pi = \left(\frac{Yi}{Xi}\right) = \frac{1}{1+e^{-(Bo+B1Xi)}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

$$Pi = (Yi/Xi) = \frac{1}{1+e^{-Zi}}, \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

where Pi, which varies from 0 to 1, is the likelihood that an ith home has access: Zi can be represented as follows: Zi is a functional form of m explanatory variables (X).

$$Zi = \sum_{i=1}^{m} Bi.Xi \ , i = 1,2.3 \ldots . m \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(4)$$

where B_i is the model's slope parameters and B_0 is the intercept. The slope indicates how, when independent factors change, the log odds in favour of the particular household having access to assets for their livelihood vary. If P_i represents the likelihood that a household will have access, then *1-*P_i represents the likelihood that a particular household will have access to livelihood assets (LA), which may be expressed as:

$$1 - P = \frac{1}{1-Pi} = \frac{1}{1+e^{Zi}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(5)$$

Dividing equation (2) by equation (4) and simplifying gives

$$e^{Zi} = \frac{Pi}{1-Pi} = \frac{1+e^{Zi}}{1+e^{-Zi}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(6)$$

The odds ratio in favor of a certain household having access to LA is shown in equation (6). It is the ratio of the likelihood that a household will have access to the likelihood that they will not. Finally, using the natural logarism of equation (7) as follows yields the logit model:

$$Logit\ p = \ln\left(\frac{P}{1-P)}\right) = \beta o + B1X1 + \beta 2X2 + \cdots + \beta kXk + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(7)$$

Where:

P is the probability that a household has accessed resource bases or enhanced capabilities.

X_1, X_2,...,X_k are the independent variables (household determinants).

β0, β1, β2,...,βk are the coefficients to be estimated.

ϵ is the error term.

Thus if the Stochastic disturbance term *ei is taken in to consideration the binary logit model becomes*

$$Li = Bo + BiXi + BiiXii + BiiiXiii \ldots\ldots BnXn + e_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(8)$$

Where Li is dependent variable

B0Bi,Bii,Biii are coefficients

XI,Xii, Xii….Xn are independent varaiables

Ei is error term

Description of variables used in binary logit model and their hypothesis

The model's household resource base access status variable is a dichotomous variable, with a value of 1 denoting access and 0 denoting lack of access. It was measured using a survey of direct home access. Based on the body of current literature and the primary resources required by the household for subsistence, the resource access has been indexed. Out of the five resources, twelve were chosen and asked a dummy variable (Yes/No) in a questionnaire. Each household's answers to the twelve resources were totalled and indexed. After that, the number falls between 0 and 1. 0 was assigned for values below 0.5 and 1 for values over 0.5.This led to the creation of the Stata variable access, which served as the study's dependent variable (Nisha, 2022).

Through a review of the literature and the author's experience with the access status in the study area, the likely factors of household resource access were determined. The explanatory factors' definitions, measurement units, and hypotheses are given in Table 1.

Table 1

Definition and units of measurement of the variables in binary logit model

Variables	Description and measurement	Sign
SEX	is a dummy variable 1 if the household head is male, 0 otherwise	_
AGE	Age of house head	+
EDUC	Formal education of household head	+
FAMILY	Family size of household	-
DEPENDEN	Dependent household members measured (number)	-
LANDFRT	Fertility of land	+
IRRIG	Having irrigation land	+
TLU	Having livestock	+
FERTIL	Using fertilizers for cultivation	+
EXTEN	Service of extension workers	+
TRAIN	Getting training for productivity	+
CREDIT	Getting credit service for enhancement of productivity	+
COOP	Membership to cooperative/ Union	+
LEAD	Leadership role in organization	+
AGRO	Location of the place (low, middle or Highland)	+
ROAD	Access to all weather road	+
CLINIC	Access to health services nearby	+
VETCLINIC	Access to veterinary clinics for livestock	+
ENERGY	Access to electricity	+
WATER	Access to clean water for domestic consumption	+
INPUTS	Availability of agricultural inputs for production	+
AID	Access to local and International NGO aid	_
COMMUN	Access to telephone, radio and television	+

RESULTS AND DISCUSSION

Descriptive statistics

Table 2 displays several intriguing patterns and connections from the descriptive study of the main livelihood resources and capacities in the highland, midland, and lowland agro-ecological zones. The midland and highland regions had a higher proportion of male responders than the lowland region. The midland, lowland, and highland zones, in that order, have very different levels of irrigation access. Compared to the highland zone, the lowland and midland zones used a lot more fertilizer. In a similar vein, the highland zone had comparatively less access to agricultural extension services than the midland and lowland zones. In the lowland zone, training participation was comparatively lower, indicating a marginal association with agroecology, but it was high throughout all zones.

The agro ecological zones—lowland, midland, and highland—were positively correlated with credit availability. The zones differed in terms of cooperative participation. While there were about equal numbers of members and non-members in the lowland zone, there were more members than non-members in the midland zone. The midland zone had very poor road access, the highland zone had moderate access, and the lowland zone had good access. The midland region has the most access to clinics, followed by the lowland and highland regions, in that order. The midland region had nearly universal access to veterinary care, whereas the highland and lowland regions had less.

In the midland and highland zones, the energy availability is very variable, whereas in the lowland zone, it is zero. However, because access was often limited in most zones, there was no discernible relationship between water availability and agroecology. In comparison to the highland zone, the midland and lowland zones had substantially better access to agricultural input. The midland region had the most access to help, while the highland and lowland regions had the lowest. There was no difference in the degree of communication between the zones, indicating that the respondents participated equally in community activities. A one-way ANOVA was used to examine the mean values for age, education, family size, dependency ratio, TLU, land size, and income across the three agro-ecological zones, which stand for highland, midland, and lowland. The F-test and p-value results indicate that these means differ significantly from one another (Table 3).In the midland zone, the mean age was 3.84, followed by the highland zone at 3.76 and the lowland zone at 3.19. These differences' significance is confirmed by the p-value of 0.0002 and the F-value of 8.79. The greatest mean of 1.61 was found in the highland zone, followed by the lowland zones at 1.31 and the midland zones at 0.903. These differences in education levels were substantial. The p-value of 0 and the F-value of 17.82 attest to the statistical significance of the result. The typical family size was 0.847 in the midland zone, 0.791 in the lowland zone, and 0.519 in the highland zone. Notable differences are confirmed by the p-value of 0 and the F-value of 10.19.

Table 1

Descriptive Statistics of Discrete Explanatory Variables

Variable	Category	Climate conditions						X^2	Pr.
		High land		Mid land		Lowland			
		Freq.	%	Freq.	%	Freq.	%		
SEX	Male	87	66.4	153	77.6	56	18.9	5.8295	0.054
	Female	44	33.5	44	22.3	16	22.2		
IRRIG	Yes	47	31.7	60	40.5	41	27.7	15.975	0.000
	No	84	33.3	137	54.3	31	12.3		
FERTI	Yes	108	82.4	192	97.5	70	97.2	28.4054	0.000
	No	23	17.5	5	2.5	2	2.8		
EXTEN	Yes	114	87	194	98.9	70	100	28.9058	0.000
	No	17	12.9	2	1.0	0	0		
TRAIN	Yes	120	92.3	183	92.9	61	84.7	4.6802	0.096
	No	10	7.6	14	7.1	11	15.2		
CREDIT	Yes	80	61.5	163	82.7	72	100	44.6111	0.000
	No	50	38.4	34	17.2	0	0		
COOP	Yes	76	58.0	165	83.7	34	47.2	43.2064	0.000
	No	55	41.9	32	16.2	38	52.8		
ROAD	Yes	120	91.6	85	43.2	72	100	125.743	0.000
	No	11	8.4	112	56.8	0	0		
CLINIC	Yes	62	47.3	149	75.6	43	59.7	27.7403	0.000
	No	69	52.7	48	24.4	29	40.3		
VETCIC	Yes	59	45.1	194	98.4	32	44.4	140.487	0.000
	No	72	54.9	3	1.5	40	55.5		
ENERGY	Yes	41	31.3	28	14.2	0	0	34.3921	0.000
	No	90	68.7	169	85.8	72	100		
WATER	Yes	15	11.5	14	7.1	4	5.6	2.8034	0.246
	No	116	88.5	183	92.8	68	94.4		
INPUTS	Yes	108	82.4	192	97.5	70	97.2	61.6781	0.000

Table 2 contiues,

	No	23	17.5	5	2.5	2	2.8		
AID	Yes	55	42.5	192	97.9	20	27.8	16.5799	0.000
	No	75	57	4	2.04	52	72.5		
COMMUNI	Yes	81	61.3	130	65.9	45	62.5	0.6761	0.713
	No	50	38.1	67	34.0	27	37.5		

The largest dependency ratios were found in the lowland zones (0.388), midland zones (0.822), and highland zones (0.885). These discrepancies are validated by the p-value of 0.0000 and the F-value of 11.53.With F=32.38 and p-value=0, the TLU values were highest in the highland zone (3.21), followed by the midland (3.11) and lowland zones (2.33).With a F=13.15 and a p-value=0, the lowland zone had the biggest land size in hectares (1.00), followed by the midland (0.817) and highland (0.717).

The highland and lowland zones had mean incomes of 0.107 and 0.069, respectively, whereas the midland zone had the greatest mean income of 0.233. The significance of these discrepancies is confirmed by the p-value of 0.0006 and the F-value of 7.58.The impact of agroecology on the characteristics of rural households is highlighted by the fact that all of the explanatory variables examined—age, education, family size, dependence ratio, TLU, land size, and income—show statistically significant changes among agro-ecological zones.

Table 2

Descriptive Statistics of Continuous Explanatory Variables

Variable	Agro-ecology of households				
	High land	Midland	Low land	F-value	P- value
	Mean	Mean	Mean		
Age	3.76	3.84	3.19	8.79	0.0002
Education	1.61	.903	1.31	17.82	0.0000
Family Size	.519	.847	.791	10.19	0.0000
Dependency ratio	.885	.822	.388	11.53	0.0000
TLU	3.21	3.010	2.33	32.38	0.0000
land	.717	.817	1.00	13.15	0.0000
Income	.107	.233	.069	7.58	0.0006

The Econometric Model: Binary Logit Regression

With a sample size of 399 observations, a logistic regression was performed to examine the factors influencing resource access, as indicated in Table 4. With a p-value of 0.0000 and a Wald chi-squared statistic of 73.90, the results fall below the traditional 0.05 criterion of significance. This indicates that a significant portion of the difference in access to resources may be explained by the independent factors taken together. In addition, the model's very excellent explanatory power is demonstrated by the Pseudo R-squared value of 0.5196, which shows that it accounts for over 52% of the variation in the dependent variable, *access_a.*

Education (edu) had a p-value of less than 0.001 and a value of 1.997 at the variable levels. This suggests that the log chances of access increase by about two units for every unit increase in educational attainment. Higher education would likely improve socioeconomic status, awareness, and skill, which would improve one's ability to utilise the resources at hand. This is in line with earlier research showing a favourable relationship between livelihood assets and schooling (Tran, Tran and Tran, 2018).

Another significant factor influencing access was house ownership, with a p-value of 0.010 and a coefficient of 1.500. Possession of a home offers security and stability, which may facilitate access to resources. Additionally, it might be a sign of financial stability, which enables households to take advantage of opportunities and services. According to other research, resource access and property ownership are strongly positively correlated (Doling & Ronald, 2010). Another important factor was the availability of clean drinking water (drnk), which showed a p-value of 0.002 and a coefficient of 2.506. Access to other essential resources was considerably higher in households with better access to drinking water. A key component of health and wellbeing, clean water is frequently associated with improved access to services like healthcare and education. The robust correlation between water availability and wider resource availability is supported by earlier research(Tadadjeu *et al.*, 2020).

To improve rural livelihoods, specific interventions are required in the three most significant drivers of resource availability: education, home ownership, and access to clean water.

Table 3

Binary Logit Regression Result on Resource access of selected districts

Access_a	Coeff.	SE	Z	P>Z	95% Conf. Interval	
educ	1.997	0.34	5.84	0.000	1.33	2.66
Land1	1.070077	0.61	1.74	0.001	-0.132	2.27
House1	1.499517	0.58	2.59	0.010	0.362	2.63
drnk	2.505969	0.79	3.14	0.002	0.943	4.069
clnc	1.954769	0.42	4.61	0.000	1.123	2.785
school	3.091358	0.92	3.37	0.001	1.293	4.88
transport	2.319907	0.44	5.25	0.000	1.45	3.18
Spcial	1.774096	0.80	2.21	0.027	0.200	3,34
Help	1.448523	0.60	2.38	0.017	0,256	2.64

Table 3 continues,

Credit	2.262481	0.51	4.43	0.000	1.262	3.26
Acct	2.4447	0.47	5.18	0.000	1.52	3.36
Coop1	.952605	0.63	1.50	0.134	-0.294	2.19
cons	-11.647	1.86	-6.36	0.000	-15.49	-8.19

Number of Obs= 399, Wald chi2(12)= 73.90, Pro>chi^2= 0.000, Pseudo= 0.5196, Log pseudo likelihood= -118.79619

The coefficients 3.091 (p = 0.001) and 1.955 (p < 0.001) suggest significant beneficial benefits from these characteristics, such as access to health care services (clnc) and school (scho). It has been demonstrated that these results demonstrate how healthcare and education infrastructures have improved socioeconomic standing and resource accessibility. While health preserves production and enables the society to engage in economic activities, education equips the populace with the skills and knowledge they need. These variables' statistical significance highlights how important they are for promoting resource access (Tran, Tran, & Tran, 2018).

The transport access variable, Transp, has a coefficient of 2.320 and a p-value of less than 0.001, making it significant for improving resource availability. In addition to improving access to markets, health care, and other educational services, infrastructure access lowers a number of expenses. According to Manrique *et al.*(2020), there is a strong correlation between resource availability and transportation access.

In this sense, social networks (coefficients of 1.774; p = 0.027) and assistance from others (coefficients of 1.449; p = 0.017) have a considerable impact on access to resources. Social networks are crucial for giving people the networks, information, and chances they need to get through challenging circumstances. However, in order for households to overcome resource limitations, it would be crucial to have outside assistance, such as funds or counsel(Ndikumana & Pickbourn, 2016).

Financial inclusion is another important factor, as evidenced by the variables for bank account ownership (acct) and credit availability (credit), which have respective coefficients of 2.262 and 2.445 (both have p-values less than 0.001). This suggests that having a financial endowment enables a household to invest, manage expenses effectively, and generally build skills to improve their access to resources. The research also provides strong support for these points (Ndikumana & Pickbourn, 2016).

With a p-value of 0.081 and a coefficient of 1.070, land ownership is marginally significant and may be influenced by additional contextual factors. With a coefficient of 0.953 and a p-value of 0.134, cooperative membership is not statistically significant at the 5% level, indicating that it has no direct impact on resource access in this investigation. Nonetheless, prior research indicates that cooperatives frequently contribute significantly to enhancing household access to resources (Wossen et al., 2017).

The significance of the factors included is demonstrated by the fact that resource access is extremely low at baseline when none of the important determinants are present, as indicated by the constant term (_cons) of -11.847 and the p-value of less than 0.001.

SUMMARY

Logistic regression analysis demonstrates that a variety of factors impact resource access in Ethiopia's rural East Wallaga Zone. Financial inclusion, social networks, healthcare, education, and transportation infrastructure are some of these significant drivers. While transport lowers costs and improves resource accessibility, improved access to hospitals and schools expands socioeconomic chances. Financial resources and social support networks are additional factors that influence households' access to essential services. Cooperative membership and land ownership, however, were not important in our research and might vary depending on the circumstances.

Significant variations between agro-ecological zones were also revealed by descriptive analysis. In many respects, the highland and lowland zones fell behind, while the midland zone had superior access to the majority of essential resources, such as credit, veterinary care, and irrigation. In contrast to the lowland zone, which lacked energy and agricultural inputs but excelled in transportation infrastructure, the highland zone had greater educational attainment but had less access to resources. Targeted efforts are required to close resource gaps when these discrepancies are present.

CONCLUSION

According to the study, access to livelihood resources in Ethiopia's East Wallaga Zone is determined by agro-ecological conditions. In terms of service accessibility, both the highland and lowland zones had difficulties, however the midland zone had the best access to essential resources. To guarantee greater access to resources, enhanced resilience, and a decrease in inequality for fair development, these disparities must be addressed through focused initiatives.

Reducing vulnerabilities and promoting sustainable livelihoods require increasing access to social support networks, financial services, and infrastructure. To alleviate inequities and improve resilience, policymakers should give financial inclusion, healthcare, education, and transportation top priority. To further guarantee sustainable and equitable resource usage, local institutions and community-based resource management should be strengthened.

Policy Implications:

Place a strong emphasis on funding initiatives that promote economic participation and social cohesiveness, such as healthcare and educational facilities in underprivileged communities. The availability and affordability of markets, healthcare, and education might all be improved by transportation infrastructure. Expand financial inclusion by giving rural households access to bank accounts, credit, and other means of investing in revenue-generating ventures and effectively managing risks.

Additionally, during times of crisis, community-based programs can improve access to information, resources, and services by fortifying social support networks. Targeted interventions, such as better access to energy and agricultural inputs in the highland zone and filling in service delivery gaps in the lowland zone, would guarantee the reduction of agro-ecological inequality. Increasing resilience and decreasing inequality can also be achieved by empowering local institutions to manage resources sustainably.

In the East Wallaga Zone, these interventions can significantly improve rural livelihoods, promote sustainable development, and increase resilience against climate change and conflict-related issues provided they are

supported by evidence-based policies and community involvement.

CRediT authorship contribution statement

Dereje Chimdessa: Conceptualization, methodology, Investigation and writing

Admassu Tesso: Visulization, validation and supervision, review and editing

Dereje Tolera: Validation. Supervision, review and editing

Declaration of competing interest

The authors declare that there is no conflict of interest.

Data availability

Data will be made available on request

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REFERENCES

Ayal, D. (2022) *Poverty, Livelihoods and Sustainable Development*. https://doi.org/10.1017/9781009325844.010.1171.

Bouteska, A., Sharif, T., Bhuiyan, F., & Abedin, M. Z. (2024). Impacts of the changing climate on agricultural roductivity and food security: vidence from Ethiopia. *Journal of Cleaner Production, 449*, 141793. https://doi.org/10.1016/j.jclepro.2024.141793.

Bouteska, A., Sharif, T., Bhuiyan, F., & Abedin, M. Z. (2024). Impacts of the changing climate on agricultural productivity and food security: Evidence from Ethiopia. *Journal of Cleaner Production, 449*, 141793. https://doi.org/10.1016/j.jclepro.2024.141793.

Coccia, M. (2023). Theories of development. In *Global encyclopedia of public administration, public policy, and governance* (pp. 12719- 12725). Cham: Springer International Publishing. https://doi.org/ 10.1007/978- 3-030-66252-3.

Dereje H., A.S.& A.A. (2021) 'Does building the resilience of rural households reduce multidimensional poverty? Analysis of panel data in Ethiopia', *Scientific African*, 12, p. e00788.https://doi.org/10.1016/j.sciaf.2021.e00788.

Doling, J., & Ronald, R. (2010). Home ownership and asset- based welfare. Journal of housing and the built environment, 25, 165-173. https://doi.org/10.1007/s1090 1-009-9177-6.

Ellis, F. (2000) 'The determinants of rural livelihood diversification in developing countries', *Journal of Agricultural Economics*, 51(2), 289– 302. https://doi.org/10.1111/j.1477 - 9552.2000.tb01229.x.

Gecho, Y., Ayele, G., Lemma, T., & Alemu, D. (2014). Livelihood strategies and food security of rural households in Wolaita Zone, Southern Ethiopia. Dev Country Stud, 4(14), 123.

Gecho, Y. (2017). Rural farm households' income diversification: The case of Wolaita Zone, Southern Ethiopia.

Social Sciences, 6(2), 45-56. https://doi.org/10.11648/j.ss.20170602.12.

Porter, D. C., & Gujarati, D. N. (2009). Basic econometrics. New York: M cGraw-Hill Irwin. ISBN 978-0-07-337577-9 MHID 0-07-337577-2

Kassegn, A., & Abdinasir, U. (2023). Determinants of rural livelihood diversification households' strategies: In the case of north Wollo zone, Amhara National Regional State, Ethiopia. Cogent Economics & Finance, 11(1), 2185347. https://doi.org/10.1080/ 233220 39.2023.2185347.

Kothari, C. R. (2004). Research methodology: Methods and techniques. New Age International. ISBN (13) : 978-81-224-2488-1

Manrique, J., Cordera, R., Moreno, E. G., & Oreña, B. A. (2022). Equity analysis in access to Public Transport through a Land Use Transport Interaction Model. Application to Bucaramanga Metropolitan Area-Colombia. Research in transportation business & management, 42, 100561. https://doi.org/10.1016/j.rtbm.2020.100561.

Tolera, M. (2023). The effects of violent civil conflicts on household security and government responses in east wollega zone, Oromia regional state. Oromia Regional State (May 12, 2023). https://doi.org/DOI:10.22158/wjeh.v5n3p106.

Mutea, E., Rist, S., & Jacobi, J. (2020). Applying the theory of access to food security among smallholder family farmers around North-West Mount Kenya. Sustainability, 12(5), 1751. https://doi.org/10.3390/su120 51751.

Ndikumana, L., & Pickbourn, L. (2017). The impact of foreign aid allocation on access to social services in sub- Saharan Africa: The case of water and sanitation. World Development, 90, 104-114. https://doi.org/10.1016/j.worlddev.2016.09.001.

Nigussie, K. D., Admassie, A., & Jayamohan, M. K. (2021). The effect of rural poverty on access to land in Ethiopia. International Journal of Rural Management, 17(2), 262- 287. https://doi.org/10.1177/097300522097106 2.

Kabir, R., Nisha, M., & Islam, M. T. (2022). Data Analysis with STATA: A Comprehensive Guide for Data Analysis and Interpretation of Outputs. ISBN 978-984-35-3165-0 [First Edition]

Singh, S., Sharma, G. D., Radulescu, M., Balsalobre-Lorente, D., & Bansal, P. (2024). Do natural resources impact economic growth: An investigation of P5+ 1 countries under sustainable management. Geoscience Frontiers, 15(3), 101595. https://doi.org/10.1016/j.gsf.2023.101595.

Tadadjeu, S., Njangang, H., Ningaye, P., & Nourou, M. (2020). Linking natural resource dependence and access to water and sanitation in African countries. Resources Policy, 69, 101880. https://doi.org /10.1016/ j.resourpol.2020.101880.

Bekuma, T., Mamo, G., & Regassa, A. (2022, April). Variability and trends of climate in east Wollega zone, Western Ethiopia. In IOP conference series: Earth and environmental science (Vol. 1016, No. 1, p. 012032). IOP Publishing. https://doi.org/10.1088/ 1755-1315/1016/1/012032.

Quang Tran, T., Anh Tran, T., & Thi Nguyen,

H. (2018). Education and the livelihood of households in the Northwest Region, Vietnam.: https://doi.org/https://link.springer.com/article/10.1007/s10 671-018- 9242-6 1.

Wang, Y., Zhang, Q., Li, Q., Wang, J., Sannigrahi, S., Bilsborrow, R., ... & Song, C. (2021). Role of social networks in building household livelihood resilience under payments for ecosystem services programs in a poor rural community in China. Journal of Rural Studies, 86, 208-225. https://doi.org/10.1016/j.jrurstud.2021.05. 017.

Zakari, S., Ibro, G., Moussa, B., & Abdoulaye, T. (2022). Adaptation strategies to climate change and impacts on household income and food security: Evidence from Sahelian region of Niger. Sustainability, 14(5), 2847. https://doi.org/10.3390/su140 52847.

Zewdie, M., Wondaferahu, A. & Malebo, M. (2024) 'Discover Sustainability Nexus between natural resource endowments and economic growth in selected African countries https://doi.org/10.1007/s4362 1-024- 00448-3.