

The Determinants of Vulnerability to Poverty Among Female Headed Households in Rural Ethiopia: The Case of West Arsi Zone, Shashemene District

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Abstract: Women are the ones that suffer the most from poverty around the world. The determinants of poverty vulnerability among female-headed households in Shashamane district are investigated in this study. In West Arsi Zone, Shashemene district, the study's goals were to assess poverty indicators, poverty levels, and how female-headed households cope with poverty. Mixed methods were employed in this study, with data coming from both primary and secondary sources. A total of 220 people were polled using the simple random sampling approach. A Cost of Basic Needs (CBN) technique was used to establish the total poverty line, and the major data for the study was acquired using structured questioners. The logit regression model and odd ratio analysis were used to analyze the poverty index descriptive statistics. 89 (40.45 percent) of the 220 surveyed household heads were determined to be poor. The results of the logistic regression demonstrate that the household's head's education, age, house ownership, income, and household size are all important factors of the household's susceptibility. Interventions should aim to improve or initiate alternative income generating activities to increase the real income of households through well-paying and better job creation through the establishment of micro and small scale enterprises, and improving the use of family planning with increased economic and social infrastructure to reduce the vulnerability of female headed households. As a result, stakeholder interventions to address the determinant factors are important measures to take, as is strengthening economically and environmentally sustainable coping strategies.

Keywords: Poverty, Logit Model, Female Headed Households, Shashamene District

1. Introduction

Women make up the bulk of the poor in both developed and developing countries, accounting for up to 70% of the world's impoverished [5]. Women are the ones that suffer the most from poverty around the world. Although men, women, and children are all affected by poverty, there appears to be a stronger link between women and poverty. They are poorer than men, with less access to and control over socioeconomic resources including land, livestock, and income. The International Fund for Agricultural Development [15]. Concluded in a comprehensive report on the situation of global rural poverty that rural women in developing countries were among the poorest and most vulnerable persons on the planet.

Poverty in Africa is currently the continent's most pressing development concern. Poverty is prevalent, intense, chronic, gender-biased, and mostly a rural condition on this continent.

Poverty in Africa has been characterized as mostly a rural phenomenon, not only because the majority of the population lives in rural areas, but also because economic activity is distributed differently in rural and urban areas [26]. Female headship is thought to be on the rise around the world, with a large proportion of these households living in poverty in both developed and developing countries. As a result, female-headed households have become an easily identified target category for poverty reduction efforts. However, the effectiveness of such targeting has been questioned by many [24].

Female-headed households (FHHs on wards) are the poorest among rural women in particular. Despite the increase in numbers and the significant duties put on FHHs, they do not have the resources to adequately nurture their families and govern their households [15]. It makes it difficult for many female-headed households to make ends meet and maintain a good level of living. FHHs with a single source of income and no other means of subsistence are thus economically vulnerable. Women's poor economic status, compounded by exposure to open market economies, and deterioration of economic conditions fueled by globalization, are all factors that contribute to their vulnerability. This traps FHHs in a never-ending cycle of poverty, barely meeting their members' fundamental requirements [15].

Ethiopia is one of the developing countries with the aforementioned characteristics of poverty, as well as the formation and rise of female-headed households. She is Sub-Saharan Africa's second most populous country. The majority of Ethiopians live in rural areas, which have a higher prevalence and severity of poverty than metropolitan areas. In 2004/05, 38.7% of the population was poor, with 39.3% of the rural population and 35.1 percent of the urban population being below the national poverty level [21].

Ethiopia is no different; female-headed households have steadily increased as a percentage of total households [16]. In Ethiopia, for example, women headed one-fourth of all rural households in 2002 [28]. In light of this, it is critical to address the issue in terms of determining the root reasons and assessing potential solutions.

This might be done on a broad scale or targeted at specific areas or people within society. However, because poverty is essentially a problem at the person or household level, micro-level analysis is necessary [6]. In this context, the study will concentrate on the factors that influence poverty in female-headed households in the Shashemene district's West Arsi zone.

2. Statement of the Problem

The extent of poverty varies according to a society's distinct groups. It has diverse effects on persons with different qualities since they have different roles, needs, and limits. The majority of women in the world now live in poverty, primarily in developing countries. Women made up over 70% of the world's impoverished population, as has been stated numerous times [9]. Many studies on women and development have found that women, in general, and female-headed households, in particular, are poor. Although most impoverished women live in male-headed households, the poorest women live in female-headed households. Because Ethiopian poverty is similar to that of any other developing country, it also has a similar picture when it comes to women. Ethiopia, like many other developing countries, demonstrates that poverty has significant gender dimensions, with women suffering poverty differently and disproportionately. As the country's poverty line rises, the number of women caught in the trap rises disproportionately. Agriculture, including grain

and livestock production, is the mainstay of Ethiopia's economy. Agriculture accounts for 45 percent of the country's Gross Domestic Product (GDP), more than 80% of job possibilities, and more than 90% of the country's foreign exchange profits. However, external shocks such as climate change, worldwide price variations of exports and imports, and other external factors make the Ethiopian economy, particularly agricultural development, extremely sensitive. The Ministry of Agriculture [20]. Published a report in 2010.

Rural Ethiopian women make up around 84 percent of the population [7]. Rural women are incorporated into the rural economy, which is mostly labor-intensive and places a significant physical strain on everyone, including children. Rural women, like women in other regions of the developing world, contribute significantly to the agricultural sector, but they are often subject to poverty. In rural sections of the country, particularly female-headed households are among those that are hardest afflicted by poverty. This is mostly due to women's poor social and economic circumstances, which are a result of the country's gender inequities and discrimination [2, 21, 10, 15].

The poverty situation in Oromia is considered to be the worst. In 49 declared drought-prone zones, it faces both long-term and short-term food security issues [19]. Approximately 87.4 percent of the region's residents are agrarians who rely on a rain-fed agricultural production system for livelihood [7]. Women are the worst sufferers of poverty in this region, accounting for approximately 49.59 percent of the total population [7].

Given the foregoing points, studies on women and poverty would be useful in understanding the characteristics and causes of women's poverty, as well as how these elements differ between men and women, in order to assess the scope, severity, and breadth of the problem. Such empirical studies would serve as a foundation for assessing the government's poverty-reduction programs and policies. This may also aid in the identification of other elements not expressly addressed in the current plan. As a result, by focusing on female-headed families, this study aims to investigate women's poverty challenges. Female-headed families are thought to be in a worse predicament than male-headed households, owing to a lack of critical livelihood assets such as land, cattle, and labor [19].

Poverty is defined as the ex-post realization of consumption in relation to a socially set minimal threshold (poverty line), whereas vulnerability is defined as the ex-ante expectation of consumption in relation to this threshold. Even if the individual is not now impoverished, it is frequently linked to the impacts of "shocks" such as a drought, a significant price increase, or a financial crisis. As a result, vulnerability is an important aspect of happiness since it influences people's behavior (in terms of investment, production patterns, and coping methods) as well as their views of their own circumstances. Even though focus is paid to the study of poverty in developing countries, a review of the literature on home susceptibility to poverty reveals that there are very few empirical research on household

vulnerability to poverty. However, lowering susceptibility is a must for meeting global and national food security [17, 11]. Even though Ethiopia has a few studies on the vulnerability of rural households to poverty, the most of them are located in the country's northern and eastern regions [18]. [4, 30] For example, focus on poverty and food insecurity, as do the majority of these scholars. As a result, past studies on poverty vulnerability are scarce in Ethiopia as a whole, let alone in the Shashamene district, where no such studies exist. As a result of the identified vacuum in the literature, a study on the analysis of household vulnerability to poverty in the case study area is required. The study examines the relationship between gender and government rural development policies in Ethiopia, as seen by the rural community. The research identifies the low-income FHHs and their characteristics. The research also applies comparison of male and female headed families to uncover sources of vulnerability. Resource endowments, support institutions, prioritized livelihood methods and possible outcomes and variances in households. The study also gives crucial insight for policymakers to figure out primary causes of poverty in FHHs by identifying some of the key micro level binding restrictions to poverty elimination.

Shashemene district was located in the Oromia Region's South-Eastern Oromia Administrative Zone. It is vulnerable to food insecurity and flooding, as evidenced by the fact that 29 of the 39 rural kebeles are food insecure. Furthermore, in this area, gender bias against women is well engrained in culture, putting FHHs at a higher risk of poverty. In this district, female-headed households are typically denied access to land, cattle, credit, other assets, as well as education, health care, and extension services [23]. As a result, effective anti-poverty policy initiatives must consider not only who is poor now, but also who will be poor in the future. This leads to the concept of "poverty vulnerability," which refers to the possibility of a household becoming impoverished in the near future [29].

The study looked at the vulnerability of rural female-headed households to poverty in the Oromia Region's Shashemene district. Its goal was to address the following essential questions:

What is the social impact of poverty on the district's female-headed households?

How is poverty viewed and defined in the community, particularly among female-headed households?

How does the community assess the susceptibility of female-headed households in the study region to poverty?

3. Research Methodology

Shashamane district is located in Oromia Administrative Regional State at about 250Km due south of Addis Ababa. Geographically the area is located at 70 North latitude and 380 East longitudes. It lies within the Great Rift Valley system and is close to the holiday resorts at Awassa, Langanjo and Shala, Abiyata park [27]. Its altitude ranges from 1,672 to 2772 m above sea. Mount Abaro is the highest

point. There are four rivers namely, Gogeti, Melka Oda, Issa and Dhadhaba [14]. Shashamane is one of the fastest growing urban centers in Oromia National Regional State and its district has been restructured into thirty administrative kebeles. Some of them are namely: 1--Shasha, 2- allelu- 3 – Kerara Filicha -4-Turufe Kechema-5-Sole - 6- dida Cabi-7- kuyera and the likes.

The rural land of Shashemene stretches over 1,858 hectares of Land. Climatically, Shashemene district falls in to three climatic zones known as Dega, Woinadega, and Kola. The temperature level ranges from 12-280 centigrade and yearly rainfall varies from 1,500-2000mm. It also experiences moderate temperature and rainfall (Ibid).

Shashamane district is the residence of different ethnic groups. Predominantly Oromo, Amhara, Wolayita, Gurage, Kanbata, Sidama, Tigre, Jamaican, Arabs are the major compositions that constitutes more than 85% of the population [25]. The population of the district is rapidly increasing from time to time at an average growth rate of 5.4% per annual. According to Shashamane wereda Administration report the current population of the Shashemene district is over 236, 5437.

The dwellers of shashemene area are the followers of different religion namely Islam, protestant, Orthodox Christianity, catholic, the seven day advents, waqefeta and Rastefarians.

The study was used both primary and secondary data which are planned and utilized in this study. The primary sources of data were from the communities living in Shashemene district of the Oromia National Regional State who have different societal status (men, women and the youth) such as women households, women affairs, kebele, woreda and zonal administrative personnel and other organizations working on similar social and women households issues, and relevant government bodies from the study area, whereas the secondary sources were included, from the National Household Survey which was conducted by the Shashemene Bureau of Statistics books, journals, research reports, published and unpublished materials. The researcher uses secondary data to support primary data.

Data collection process was undertaken through structured questionnaires' with female household heads by enumerators. However, to obtain information from illiterate household heads, the enumerators interview the respondents from the interviews guideline by Afan Oromo and then filled on questionnaires. The questionnaire includes consumption expenditure of the households, social characteristics, economic characteristics and demographic characteristics in this study the interviews would be used questionnaire as a tool of collecting data. Therefore, in this study, both informal and in-depth interview were employed.

The researcher would employ a cross-sectional survey to investigate the determinants of vulnerability to poverty in female headed households in Shashamene district 217 sample size is determined using mathematical formula developed by [13]. Would be used:

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

Where;

n=Household sample size

N=Total household population size registered in kebele office=510

e=Degree of precision=0.05%

z=with the given level of confidence 95% Z=Confidence level=1.96

p=0.5 (sample proportion). q=0.5 {(1-0.5) i.e. 1-p}

$$n = \frac{(1.96)^2 x (0.5 x 0.5) 500}{(0.05)^2 (500-1) + (1.96)^2 x (0.5 x 0.5)} = 217$$

Then, the researcher was used to apply proportionate sampling to obtain how many respondents are selected from each stratum by using formulas: $C = \left(\frac{n}{N}\right) NJ$ The stratum is also as follow: Where,

C=Sample size allocated to each strata.

NJ=determinants of vulnerability to poverty and women households

N=total number of Population

n=total sample size in the households

By inserting the above information into the sample size determination formula, the researcher would determine the desired base sample size which is 220 for the research.

The researcher would employ stratify sampling technique in order to accommodate the occupation heterogeneity to collect data because of the time limitation. In the selected district there were 510 target populations. The formula gives n=217 and the researcher added other 3 as reserve for unreturned questionnaire and total of 220 sample size are undertaken to collect the data. Surveyed families were selected by using proportional random sampling method. The researchers were conducted interview and FGD with female headed household of the district and they were also selected in a simple random sampling.

Model specification

Binary response models (e.g. probit, logit) are used where poverty is considered as a “yes” or “no” decision. A Logit model is adopted in order to model factors that determine the probability whether a household is poor or not, i.e., the incidence of poverty. Hence the logit model is used for this study. Here the dependent variable is thus dichotomous, indicating whether a FHH household is poor or not relative to the poverty line. The model is given as:

$$Y_{it}^* = \beta x_{it} + \epsilon_{it} \quad (1)$$

Where Y_{it}^* is the underlying response variable in which $Y_i = 1$ if poor, $Y_i = 0$ if non-poor, And X_i is a set of explanatory variables, and U_i is the residual. And the coefficients of the estimated model give the factors that more likely make households poor.

Here poor or non-poor are defined according to the following poor categories: poor; PCAE (Per capita Adult Equivalent Expenditure) below 2 dollar per day (1620birr per month) and the total food calorie available for consumption

in the household per AE to the minimum level of subsistence requirement per AE (2300 kcal).

Household beyond this threshold is said to be food in secured (poor), otherwise non-poor; PCAE expenditure greater or equal to 2dollar per day (1620birr per day) and the total food calorie available for consumption in the household per AE to the minimum level of subsistence requirement per AE (2300 kcal). Household beyond this threshold is said to be food secured (non-poor), otherwise poor.

Inflating of the poverty lines based on CSA data on price indexes is made for 2018 to 2019. Hence, the survey data is measured in terms of the price of 2018/2019 to use the poverty line of 1620. In order to measure the extent of poverty, we need to develop a poverty measure that can summarize the magnitude of poverty. In many studies, FGT measure of poverty developed by [12]. Has been found manageable in presenting information on the poor; hence will be used in this study too. This measure summarizes the level, depth and severity (incidence, inequality and intensity respectively) of poverty.

In order to identify the determinants of vulnerability to poverty Logistic regression model would be employed. The explanatory variables are considered to be socio-economic and demographic characteristics, which includes sex, age, marital status, family size, and level of education, and education of the household etc. The logistic regression calculates changes in log odds of the dependent, not changes in the dependent itself. After transforming the dependent variable into logit, maximum likelihood estimation would be employed to determine the coefficients of the variables.

As Hosmer and Lemeshew (1989) pointed out, a logistic distribution (logit) has advantages over the other in the analysis of dichotomous outcomes variable in that it is an extremely flexible and easily usable model from mathematical point of view and results in a meaningful interpretation. In view of this, the logistic function is selected for this study, since it represents a close approximation to the cumulative normal distribution and easy to work with Gujarati in [13].

$$P_i = F(Z_i) = \frac{1}{1 + e^{-(\alpha + \beta_i X_i)}} = \frac{1}{1 + e^{-Z_i}}$$

Where e is the base of the natural logarithm.

X_i represents the i^{th} explanatory variables

P_i is the probability that an individual is being poor given X_i .

α & β_i are regression parameters to be estimated

Hosmer and Lemeshew (1989) pointed out that a logistic model could be written in terms of the odds and log of odds, which enable one to understand the interpretation of the coefficients. The odds ratio is the ratio of the probability that an individual or household would be poor (P_i) to the probability of a household would not be poor ($1 - P_i$).

$$1 - P_i = \frac{1}{1 + e^{Z_i}} \quad (2)$$

$$\frac{P_i}{1 - P_i} = \frac{1 + e^{Z_i}}{1 + e^{-Z_i}} = e^{Z_i} \quad (3)$$

$$\text{Therefore } \frac{P_i}{1-P_i} = \frac{1+e^{Z_i}}{1+e^{-Z_i}} = e^{(\alpha+\beta_i X_i)} \quad (4)$$

$$Z_i = \ln\left(\frac{P_i}{1-P_i}\right) = Z_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_m X_m \quad (5)$$

The dependent variable of the model is discrete variables that represent the status of poverty to determine the household poverty. Here, the minimum food calorie needed to ensure survival per adult equivalent per day is used to classify households into two groups. In this model, the dependent variable takes a value of 1 if the household belongs to below the calorie requirement, i.e. poor with the probability of P_i , otherwise a value of 0, i.e. non poor with the probability of $1-P_i$. Specification of the model is as follow Logit (poor)= $\ln p/1-p=a + b_1x_1 + u$ p =probability of being non poor $1-p$ =probability of being poor $P_i=1/1+e$ Where, P_i : is 1 the probability that the household is poor; 0 otherwise.

$$\text{Logit } Y_1 = \delta + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + \varepsilon \quad (6)$$

δ : is intercept

X_i : is explanatory variables are chosen based up on available related literatures on the subject at issue. Such variables include: initial capital, age of household head, sex of household head, Family size, the probability that the household belongs to poor line would be $(1-P_i)$.

$$\text{By: poverty} = f(\text{AGE, FEMALE, EDUC, MARIALS, FAMSIZ, SAVING, ACCESS.B, ACCESS CR, INCOME, EMPLOY, HEALTH, HOUSE.T.}) \quad (7)$$

$$\text{Where, } \text{Random variable} \\ \text{poverty} = \text{Logit} = \alpha + \beta_1 \text{age} + \beta_2 \text{female} + \beta_3 \text{educ} + \beta_4 \text{fs} + \beta_5 \text{y} + \beta_6 \text{MS} + \beta_7 \text{saving} + \beta_8 \text{house.t} + \beta_9 \text{access's} + \beta_{10} \text{employ} + \beta_{11} \text{health} + \beta_{12} \text{asset ship} + \beta_{13} \text{access} + U_i$$

Table 1. Description of Model Variables.

	Types of variable	Expected sign
Age of the household head (Age)	Continuous variable	-For (15-64)
Sex of the household head (Sex).	Dummy variable	+
Educational level of female household (Educ)	Dummy variable	-
Family size (fs)	Continuous variable	+
Income lvel of female household (y)	Continuous variable	-
Marital status of household (ms)	Dummy variable	+
Eployment status of house hold (employ)	Dummy variable	-
Access to basic need (asses.b)	Dummy variable	+
Saving of household (saving)	Continuous variable	+
Access to credit (asscrt)	Dummy variable	-
Asset ownership (asse)	Continuous	+
House ownership (houset)	Dummy Variable	+
Health of female households (health).	Dummy Variable	+

4. Results and Discussions

The socioeconomic and demographic parameters of the data acquired in the Shashemene district household survey are explained in this section. The overall poverty line (food plus nonfood consumption expenditures) is used throughout the description to distinguish poor from non-poor households. The data is analyzed using descriptive and econometric methods. The results of descriptive statistics will be presented in the first portion, followed by the results of econometrics.

4.1. The Extent of Poverty

The establishment of a poverty line makes it easier to distinguish between the impoverished and the non-poor. In calculating poverty lines, the study used both household income and the Cost of Basic Need (CBN) method. Because rural economies are characterized by commercialized economies and a lack of fundamental services, the CBN method can better explain rural poverty. This research is based on the female household's food and nonfood expenditures. The researcher attempted to estimate the cost of achieving this dietary energy need by using 2300kcal as the minimal calorie requirement per household per day in

Ethiopia. As a result, the total poverty levels at current market prices are described here.

Table 2. Poverty line of Shashemane district per month per person in birr.

Food poverty line	2780
Non- food poverty line	980
Total poverty line	3760

Source: own survey computation, 2019

Table 2 reveals that the food poverty line in Shashemene district is 2780 ETH birr, the non-food poverty line is 980 ETH birr, and the total poverty line is 3760 birr. The poverty line is calculated based on household consumption of essential needs, therefore people who spend less than Birr 3760 per household per month are poor, while those who spend more than Birr 3760 are not. Households spend 73.94 percent of their income on food and 26.06 percent on non-food products, according to the findings of this survey. When head count poverty is calculated using this line (3760Birr), 89 people (40.45 percent) live below the poverty level, whereas 131 people (59.54 percent) live above the poverty line. Based on the total poverty line, the absolute head count index was around 43%, meaning that on average, 43% of Ethiopia's rural population is unable to satisfy the minimal calorie intake, which is 2300 Kcal per adult equivalency per

day. While considering moderate head count index, the proportion is even greater (57%) but smaller (24%) when considering extreme head count index.

The poverty gap, defined as the proportion of total consumption required to bring the entire population below the poverty line, was determined to be 13% in terms of absolute poverty and 20% and 6% in terms of mild and extreme poverty gaps, respectively. When we consider moderate and extreme poverty lines, the severity of poverty is roughly 5%, whereas it is 10% and 2%, respectively.

When it comes to food poverty indicators, 52 percent of the population has consumption expenditures that fall below the absolute food poverty level, which is 10% more than the proportion of persons living in absolute overall poverty. In comparison to total poverty, the proportion of people in moderate and extreme food poverty is also larger. This could be because people spend the majority of their income on food. The food poverty gap indicates that households are 17 percent below the absolute food poverty line, 26 percent below the moderate poverty line, and 8 percent below the extreme poverty line, respectively, all of which are higher than the total poverty gap previously discussed. When compared to total poverty, the severity of poverty is also worse.

Female heads of households are 16.8% away from the absolute total poverty line, according to the poverty gap indices, while they have 24.2 percent and 9.6 percent mean consumption shortfalls relative to the moderate and extreme total poverty lines, respectively. The results also show that the severity of poverty among female heads of households is 8% in the case of absolute overall poverty, 12.7 percent in the case of moderate total poverty, and 4.3 percent in the event of extreme total poverty. In terms of food poverty lines, the result demonstrates that the depth and severity of poverty get worse just like the other situations discussed earlier.

The poverty gap indices also demonstrate that the absolute poverty gap index for female heads of families is just 3% greater than for male heads of households in terms of total poverty, but it is roughly 7% higher in terms of food poverty.

4.2. Description of Socioeconomic Characteristics

The study collected social demographic information from the twenty respondents that participated in the in depth interview. Gender variable was also measured since female informants were higher compared to male heading households.

Table 3. House hold Respondents for continues variable.

Variable	Total Sample		Poor		Non-poor		t-value
	Mean	Std. Dev.	Mean	Std. Dev	Mean	Std. Dev	
Age	44.25	9.8	4.81	10.07	41.65	8.74	-5.007*
Family Size	5.24	2.74	7.20	2.75	3.90	1.77	-10.78**
Income	2166.89	1524.88	809.82	465.68	3088.87	1205.67	16.67*
Saving	127.59	205.23	22.19	66.08	199.19	235.00	6.91

Note: *, ** indicates 1%, 5% Significance respectively. Source: Own computation 2019

Age of households and poverty

According to the table above, the average mean age of non-poor people is 41.66, while that of poor people is 48.05, with the respondent's minimum and maximum years being 24 and 70, respectively. Economically unproductive households accounted for 17 (7.73%) of the total respondents, whereas economically active households accounted for 203 (92.27%). According to survey data, in the research area, the age of female household heads is dominated by economically productive ones. The productive age group and poverty have a negative association, with the risk of being poor decreasing as the productive age group grows. Because labor productivity declines with age, income declines, and as the age of the household increases in the young group, the likelihood of being poor increases. At the 1% level of significance, the t test demonstrates that $t = -5.0075$ is significant. The age distribution reveals that the majority of female heads of families interviewed are teenagers, with young females accounting for 92.27 percent of the total. This finding is confirmed with [1] in Arba Minch.

Poverty and Household Size

In impoverished nations, parents have more children in order to maximize their chances of receiving financial assistance when they grow up. In such nations, child labor is

also a common source of revenue. High infant mortality rates, especially among the poor, tend to result in an excess of replacement births. This leads to an increase in household size, which eventually pushes people into poverty. The research area's minimum and maximum household sizes were 1 and 14, respectively. The average household size was (5.27) members, or around five (5) people. As stated in Table 3, poor households with a household size of five or more accounted for 24.72 percent of the overall poor population. Households with a household size greater than the average family size account for the majority of the poor, accounting for 75.28 percent of the total. As a result, the majority of households with larger-than-average family sizes and The people listed above are poor. This demonstrates that the size of a family and poverty have a favorable link. As the size of a family grows, so does the likelihood of being poor.

One factor could be the high expense of living in urban regions, which leaves them vulnerable even for basic requirements. The statistical study revealed a significant difference in family size between poor and non-poor households, with poor households having a mean of 7.24 and non-poor households having a mean of 3.93. The test results show a $t = -10.8665$ and a 5% significant level. On this t-test, the mean values of poor and non-poor were compared using a continuous variable.

Income and poverty

The household income ranges from birr (300) to birr (8500) a month, depending on the size of the family. The poor have an average monthly income of birr 809.82, whereas non-poor households have an average monthly income of 3088.878 birr. In the research area, there is a significant disparity in income between the impoverished and the non-poor. The test-values were 16.0149 and significant at a 1% significance level. This indicates that there is a large disparity in family income between the poor and the non-poor. As a result, the income of certain female households is very high, owing to support from relatives and, in some cases, their children who live outside Ethiopia. The implication here is that the household can either save or use the difference (2279.058) for other purposes. The 99 percent confidence interval for the mean difference shows that 2279 birr can be saved/used for other purposes.

Education and Poverty

Overall, around 65.3 percent of the household heads in the survey are literate, with varying levels of schooling, with the majority of the sample population in grades 4 to 12. Similar to the MHHS, the majority of female heads tend to focus in grades 4 to 12, whereas the number of female heads with school levels greater than 12th grade is extremely tiny. When an individual's educational attainment improves, so does his or her productivity, skill, bargaining power, and

competitiveness in the job market and in the social system. This allows households to earn more money and minimizes the likelihood of being grouped with the poor. Poverty, on the other hand, inhibits educational investment and makes households poorer. The tables below illustrate that when a household's educational level rises, their likelihood of being poor reduces, and vice versa. Non-poor households increase from a lower level of education to a greater level of education, and vice versa. This pattern is consistent with the assumption that as people's educational attainments rise, their productivity and income-generating potential rise, and they become less likely to be poor. As a result of the survey's findings, the number of non-poor households grows as household educational level rises.

At the 95 percent confidence interval, female households with the greatest educational level had a significant effect on the probability of being poor or non-poor, according to the survey's statistical tables. Illiterate, elementary (1–8), secondary (9–12), diploma holder, first degree holder, and above first degree holder are the household heads' highest educational levels [8]. Because the majority were illiterate and only had a grade 4–6 education, they were unable to apply for official or better-paying jobs.

Raise their standard of living the majority said they came from low-income homes and were forced to drop out of school owing to a lack of funds.

Table 4. The distribution households educational level.

Education level	Non poor		Poor		Total	
	Number	percent	Number	percent	Number	percent
Illiterate	2	1.53%	27	30.34%	29	13.2%
1-8	8	6.12%	32	35.95%	40	18.2%
9-12	45	34.35%	30	33.71%	75	34.1%
Diploma and cert	49	37.40%	0	0%	49	22.3%
Degree and above	27	20.60%	0	0%	27	12.3
Total	131	100%	89	100%	220	100%

Source: Own computation 2019 significant at 1%

House ownership and poverty

In most developing nations, home ownership in the studied areas is a significant indicator of poverty. Because it is household wealth that drives income flows, this measure is extremely important. Out of the total respondents, 77 percent (35 percent) of female household heads have their own home, while 143 percent (65 percent) do not. Households that do not

own a home are proven to have a positive correlation with poverty. As the number of households who do not own a home grows, the cost of housing rises, resulting in higher spending, lower income, and increased poverty. The significance of the $\chi^2 (1)=4.12 > \text{value}=0.0425$ at 95 confidence interval reveals that the housing situation of female household is a determinant of vulnerability to poverty in the study locations.

Table 5. House ownership and poverty.

Group	Poor	%	nonpoor	%	total	P values	Ch2
Ownership	21	23.59	56	42.75	77	0.0425	4.12
Rented (p and k)	68	76.41	75	57.25	143		
Total	89	100	131	100	220		

Source: Own computation 2019 significant at 5%

Summary of discrete variable

The findings of the independent chi square test analysis are reported as discrete and continuous variables individually. The variables can be used to see the link between poor and non-poor families, as well as the mean or percentage

disparities. Six discrete variables were thought to have an impact on the poverty status of female-headed households. The results of the discrete variables show that a chi-square test for the discrete choice variables shows that educational status, household health status, and house ownership, which

account for less than half of the total variables, are found to influence non-poor and poor households significantly at less than 1%, 1%, and 5% probability levels, respectively.

The survey also calculated the respondents' average monthly income by asking about their expected income level. The

monthly average income level recorded was 50 Ethiopian birr, which is less than 2 dollars a day in US dollars. Despite the fact that they were living below the poverty level of less than \$2 per day, the respondents felt overwhelmed and unable to meet their daily needs in the district.

Table 6. Summary of Sample respondent for discrete variable.

Variable	Total Sample		Poor		Non-poor		X ² -value
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	
Education	2.02	1.19	1.03	0.80	2.69	0.91	9.87*
House own	0.65	0.47	0.76	0.42	0.57	0.49	4.08**
Sex	0.92	0.26	0.92	0.27	0.92	0.26	0.24
Marital	0.61	0.48	0.59	0.49	0.61	0.48	0.29
Employ	0.56	0.49	0.92	0.27	0.32	0.47	0.29
Healthy	0.16	0.37	0.25	0.44	0.09	0.30	7.63*

Note: *, ** indicates 1%, 5% Significance respectively. Source: Own computation 2019

4.3. Econometric Analysis

A logit model was used to evaluate determinants of vulnerability poverty, as mentioned in the model specification section. When the random components of response variables are assumed to follow a logistic distribution and the majority of variables are categorical responses, this model is appropriate. The model's usefulness for econometric analysis is largely determined by how far it deviates from the actual observation, or what percentage of the actual observation is truly predicted by the model. Although there are no hard and fast rules for determining whether a model is the greatest or worst predictor, it is widely acknowledged that a model with an overall predictive power of 3% or higher is good. As a result, the researcher ran a variety of tests to see if the model suited the data. Goodness of the model: At a 1% level of significance, the result of the LR Chi² (14) value is statistically significant. This demonstrates that the model has a high level of explanatory power when it comes to understanding the data. In addition, the Hosmer- Lemeshow goodness-of-fit statistic is computed to see if the model is well-fitting as indicated by a large p-value. As a result, the model's fit to the data is excellent (see appendix 5).

Multicollinearity occurs when explanatory variables are

highly connected or have little variation between them. The problem of multicollinearity in cross-sectional data is a severe problem to check this VIF computed. There is a link between continuous variables with difficulties of multicollinearity if the VIF values for continuous variables are equal to or more than 10. However, the average VIF in this study is 1.61, which is less than 10, indicating that there is no serious multicollinearity problems.

The contingency coefficient was used to check the values of VIF for discrete variables. According to the findings, the data do not have a major problem with multicollinearity.

Heteroscedasticity test: A condition in which the dependent variable's variance changes across the data. Many regression analysis methods are based on the premise of homoscedasticity, or equal (homo) spread (scedasticity), which means that the variance is equal [13]. There are no equal variance or homogeneity of variance assumptions in logit analysis, and the error term variance is not constant. STATA software is used to perform a Cook Weisberg test for heteroscedasticity (hettest) using fitted poverty values. Chisquare (1)=1.88, Prob>ch2=0.1704 is the outcome. As a result, the dependent variable varies depending.

Table 7. Logistic regression result.

poverty	Coef.	Std. Err.	z	P>z	Odd Ratio
age	-.2475485	.0899146	-2.75	0.006	0.7807124
sex	1.359853	2.776572	0.49	0.62	3.895622
fs	.5638125	.2916584	1.93	0.053	1.75736
educ	-4.127489	1.313894	-3.14	0.002	0.0161233
y	-.0061983	.0018074	-3.43	0.001	0.9938208
ms	.6762976	1.265192	0.53	0.593	1.966583
houset	2.840815	1.407137	2.02	0.044	17.12972
health	6.368592	2.30589	2.76	0.006	0.2363
saving	.005765	.0061143	0.94	0.346	1.005782
employ	-1.7316	1.482301	-1.17	0.243	0.1770009
access_b	.9491724	1.001769	0.95	0.343	2.583571
water	2.047683	1.693065	1.21	0.226	7.749926
acsterts	-1.548413	1.142608	-1.36	0.175	0.212585
assoship	-1.236234	1.269435	-0.97	0.330	0.290476
_cons	20.52469	6.907676	2.97	0.003	8.20

LR chi2(14)=257.02 and Pseudo R2=0.8656

Source: Own computation 2019

The variable gender (sex), family size, house tenure, water, and access to essential services all have a positive relationship with the chance of being poor, according to the Logit maximum-Likelihood estimations. Variables such as marital status, education, household income, saving, age of the female household head, access to credit, asset ownership, and work status, on the other hand, are inversely connected to the likelihood of being poor.

There were 14 explanatory variables regressed, and six (6) variables were deemed statistically significant at 1% (household head's income, age, education, and health), 5% (age, education, and health), and 10% (age, education, and health) (family size and house ownership). The coefficients of gender, marital status, employment, water, credit, saving, and basic service access are statistically insignificant and inconclusive.

The logit results are explained using the model coefficient, which indicates by which factor the dependent variable changes when the independent variables change by one unit. The analysis is useful for two reasons: first, to verify the relative importance of various factors in determining poverty status, and second, to assess the potential impact that policy-induced changes in these factors will have on the probability of being poor, assuming all other factors remain constant.

Age had a negative coefficient relationship with poverty, based on the productivity theory, which claims that productivity income is low at a young age, increases in middle life, and then declines in old age. As a result, poverty is more prevalent at younger ages, diminishes in middle age, and then rises in old age.

In general, the combined influence and role of household composition variables such as household size, number of children in a home, number of employed, and age should be carefully considered when assessing household poverty determinates and coming to a better conclusion. As a result, further in-depth research is required in this field.

The size of the household has a substantial positive coefficient. The likelihood of becoming impoverished increases with the size of the household. The variable's good result is related to the high quality of the household members. The reason for this is that either many of them are not working (many children and the elderly) or they are being underpaid, resulting in a fall in per capita expenditure.

As the number of family size of the home increased by a one, holding all other variables unchanged, increased by a factor of 0.56. This shows that there is a link between household size and poverty. The findings support the idea that household size has a positive association with poverty, with the probability of a household falling into poverty increasing as the size of the home grows. In Sierra Leone, for example, Fagnäs and Wallace (2003) found that poorer households had larger households than non-poor households. This ensures that adding a household member above the average family size significantly pushes the household into poverty in the study area.

The income coefficient is negative and statistically

significant at the 1% level of significance, and it has an impact on household poverty in the research area. It means that as a household's income rises, purchasing power rises, savings rises, and meeting the minimum calorie "requirement" lessens the likelihood of sliding into poverty. According to economic theory, a household with a higher income will have a better life and hence be less vulnerable to poverty. Household income is projected to have a negative impact on rural poverty.

The determinant the likelihood of a female family head being impoverished is significantly influenced by her educational degree. Education may be a powerful tool for lifting people out of poverty. The higher the female family head's educational attainment, the less likely the home is to be impoverished.

Overall, schooling has a statistically significant negative coefficient in the study area, as expected. Education is also predicted to raise earning potential and improve labor mobility, both occupationally and geographically. At the 95 percent level of confidence interval, the negative link between household educational level and poverty was found statistically significant in influencing poverty in the research area. Holding all other variables equal, an educated household head has a higher chance of escaping poverty, with a unit increase in the head's degree of education reducing poverty by a factor of 4.12, and vice versa. As a result, it is one of the most important predictors of poverty in the study areas and plays an important role in developing poverty reduction strategies. [3] verified this result in Kenya.

At a 5% level of significance, the coefficient variable of not having a house is positive and statistically significant. Because if a household does not own a home, it is obligated to spend additional money on housing rent, which reduces the household's income. Poverty would worsen as a result. If the probability of being poor rises by 2.8 factors as the number of households without a home rises by one and all other factors remain constant, the probability of being poor rises by one. With the foundation of [22] this was established.

Odd ratio

At a 1% probability level, the age of the female family head is significant and adversely connected with poverty. The negative association suggests that when the number of economically productive people decreases, the odd ratio in favor of being poor rises, increasing the likelihood of becoming poor. The odd ratio of 0.78 for age indicates that as the age of the household grows by one year, the odd ratio in favor of being poor drops by a factor of 0.78. Female households headed by economically unproductive men are more likely to be poor than male households headed by economically effective men.

The family size of a household is statistically significant at a 5% probability level and is connected with poverty. The positive link suggests that as the size of the family grows, the odds ratio in favor of being poor grows as well. Other factors being equal, the chances ratio in favor of being poor increases by a factor of 1.75 as family size grows by one

member. One possible explanation is that homes with a large number of children may suffer from low household quality. This demonstrates that households with a significant number of economically inactive family members are more likely to be impoverished than those with a smaller family size.

At a 5% likelihood level, those households without houses show a positive link with poverty. If all other factors remain constant, the odd ratio of 17.12 for home ownership means that you are 17.12 times more likely to be non-poor than if you don't own a home.

5. Conclusion and Recommendation

5.1. Summary and Conclusion

The major goal of this study was to determine the factors that contribute to female-headed households' vulnerability to poverty in the Shashemene district. The extent of poverty varies according to a society's distinct groups. In this regard, it has been stated that women are disproportionately affected by poverty, leading to the so-called "feminization of poverty." However, the empirical validity of gender and poverty has been questioned. The goal of this study was to determine the degree of poverty and vulnerability to poverty. The data was analyzed using descriptive analyses, as well as poverty measurement utilizing FGT poverty indices and multivariate analysis.

According to the descriptive analysis of the data set, FHHs account for 40.9 percent of all households in rural Ethiopia. When numerous demographic factors are examined, it is discovered that FHHs have a larger average household size. The majority of FHHs are widowed or divorced accountants.

About 75% of FHHs are married, compared to 85.3 percent of married MHHs. In terms of educational attainment, the majority of FHHs (63.4 percent) are illiterate when compared to MHHs.

The average mean age of non-poor people is 41.66, while that of poor people is 48.05, with the respondent's minimum and maximum years being 24 and 70, respectively. Economically unproductive households accounted for 17 (7.73%) of the total respondents, whereas economically active households accounted for 203 (92.27%). According to survey data, in the research area, the age of female household heads is dominated by economically productive ones. Furthermore, 39 percent of FHHs are unemployed, compared to 17.2% of MHHs.

The majority of FHHs work in the informal economy, usually in low-paying domestic services. The assessment of household susceptibility to shock, on the other hand, reveals little difference between FHHs and MHHs.

To empirically investigate the dynamics of poverty as well as the factors of vulnerability to poverty, this study analyzes a cross sectional dataset on a representative sample of 220 households headed in 2019 in the Shashemene District, West Arsi Zone of Oromia Province. According to the findings, the number of vulnerable households is much higher than the number of currently impoverished homes. The size of the

household has a substantial positive coefficient. The likelihood of becoming impoverished increases with the size of the household. The variable's good result is related to the high quality of the household members. The reason for this is that either many of them are not working (many children and the elderly) or they are being underpaid, resulting in a fall in per capita expenditure.

Household size was greater in impoverished households than in non-poor households. This ensures that adding a household member above the average family size considerably pushes the home into poverty in the research location.

The income coefficient is negative and statistically significant at the 1% level of significance, and it has an impact on household poverty in the research area. It means that as a household's income rises, its purchasing power rises, saving rises, and meeting the minimal calorie "requirement" lessens the likelihood of sliding into poverty. According to economic theory, a household with a higher income will have a better life and hence be less vulnerable.

The element of change the probability of a female family head being impoverished is significantly influenced by her educational degree. Education can be an effective means of escaping poverty. The likelihood of a poor home decreases as the female household head's educational attainment increases. Education has a statistically significant negative coefficient in the research area, which is to be expected.

At the 5% level of significance, the coefficient variable of not owning a home is positive and statistically significant. Because if a household does not own a home, it is obligated to pay higher rent, which reduces a household's capacity to escape poverty. Household income is likely to have a detrimental impact on rural poverty.

5.2. Recommendations

In the research area, education is a significant driver of female household head poverty. Households with a greater degree of education have a decreased chance of slipping into poverty. As a result, promoting education is critical in alleviating the Town's poverty issues. Higher education, such as college and university, has been found to be a key factor in lowering poverty in the research area. Households headed by people with a first-degree or higher education did not fall into the poor group. There are fewer private colleges, and those that do exist have fewer departments. In general, the creation of human capital in the form of improved education boosts the poor's productivity and income. Therefore government, district administration and community should be emphasis to develop college and university in the area.

According to the study, household size was positively and strongly connected with poverty in the district. This has a clear impact on the district's population, as households with a large number of members are more likely to slip into poverty than those who do not. As a result, family plans and/or couple education should be offered by the responsible bodies in order to prevent such repercussions. The zonal and district health services can play a significant role in this regard.

Efforts to alleviate poverty should be conducted at the local level to raise residents' real incomes. This can be accomplished by creating a consistent stream of jobs. The main way out of rural poverty is to find long-term work that pays well. Micro and small-scale firms must be developed and promoted in relation to household skill, household age, and market opportunity.

Women's capability must be built through formal education, life skills, and business training in order to reduce economic poverty in households where women are the primary breadwinners.

In general, the study found that certain endowments play a significant impact in determining a household's poverty status. As a result, gender-sensitive poverty alleviation measures that improve the endowments of female-headed families, such as increasing education, employment, and the ability to manage fertility, should be major ingredients of inputs and productive assets, as well as providing protection against crises.

Finally, all of this will contribute to the district's poverty reduction, if not complete eradication. As a result, a collaborative effort from the government, non-governmental organizations, community-based groups, researchers, the poor themselves, and any other interested stakeholder is required at all levels and types of activity (s). When developing policy, it's important to consider the different types of poverty and vulnerability that Female Headed Households face.

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