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Determinants of women participation in income generating activities: evidence from Ethiopia

Abera Alemu*, Tesfaye Woltamo and Aklilu Abuto

*Correspondence: abrish8353@gmail.com

Department of Rural Development and Agricultural Extension, Faculty of Environment Gender and Development Studies, College of Agriculture, Hawassa University, Hawassa, Ethiopia

Abstract

This paper aims to examine the major determinants and challenges of women's participation in income-generating activities focusing on rural women of Ethiopia. To carry out this study, both primary and secondary data were used. Randomly selected 161 households were the source of primary data for this study. Secondary data were collected from the review of related literature. A binary logistic regression econometric model was implemented to identify major determinants of women's participation in income-generating activities. The finding of this study revealed that in the study area, women are not allowed by their husbands to participate in high-income earning activities. They are considered a housewife and only husband are expected to participate in high income-generating activities due to the local customs. In the study area, women's participation in the income-generating activity is determined by age, husband's education, women's education, family size, land size, market distance, livestock holding, and access to credit. This paper contributes to the literature on women's participation challenges in income-generating activities, giving emphasis to rural women's perspectives. It provides the basis for further studies aimed at challenges hindering women's participation in high-income earning activities, particularly in developing countries.

Keywords: Income generating activities, Determinants, Women, Logistic regression model

Background of the study

Women who are more than half of the world's population (Gashaw, 2015) have been on the world agenda since the United Nations organized the first women's conference in Mexico in 1975 (Boserup et al., 2013). Their participation in Income Generating Activities (IGAs) is a crucial mechanism for ensuring the rural development of developing countries (Akerele and Aihonsu, 2011). Consequently, over the past four decades, women's entrepreneurship has gained popularity around the world with a growing number of females to starting and running their own businesses (Endalew, 2020).

Nowadays, feminist studies in the academic arena and other initiatives in the world that promote empowering women have led to a desire to learn more about businesses that are owned and run by females (Gatakaa, 2012). Even though both women and men

play different roles and perform different responsibilities concerning the livelihood of their households, men have the primary responsibility for income-earning and women have the primary responsibility for the utilization of food and home management in rural households (George, 2013). This is because, in rural areas of developing countries, women participation in income generating activities is low due to limited access to productive resources like education, health, training and employment opportunities (Fawehinmi and Adeniyi, 2014). With limited participation in low income generating activities, they prioritize their income to cover family expenses particularly on food items (Madiha, et al., 2020). However, in the twenty-first century the role of women is not just limited to domestic activities rather they are playing an entrepreneur role too (Gatakaa, 2012). In line with this, the access of women to entrepreneurial ventures is widened in most countries which previously conquered by men (Kamunyu and Theuri, 2017).

The role of women in income generating activities is of paramount importance to the economic development of their households. In developing countries, however, women are not economically free, especially in rural areas. It is a very rare case that women walk against their male's decision because they are dependent on their husband's income (Paul, 2019). Consequently, recognizing the challenges of women and supporting them is crucial and vital for the development or growth of women and the fulfillment of their economic potentials. While they are often hidden, silent and not appreciated, rural women represent probably the world's most powerful untapped natural capital (Yusuf et al., 2015). The dynamic changes in the development process over the past twenty years have neither reduced poverty as expected nor have they reduced women's vulnerability situation. Most of the activities in which women engaged in their livelihood strategies are not defined as economically active employment in national account systems, yet are crucial to the wellbeing of household members (FAO, 2010). Much of women's work is also undervalued because it is typically under remunerated and often confined to the domestic or household realm (Fontana and Paciello, 2010).

In Africa, women often face seclusion and exclusion based on the socio-cultural norms of the patriarchy that ultimately limit their access to development and empowerment (Isran, 2012). Being deprived of the basic legal rights of participation in economic activities, restriction on work outside the home, lack of education and skills, the honor associated with women's sexuality, domestic workloads and the lack of awareness about the market make them dependent on their male counterparts (Butt et al., 2010). Consequently, the males get attention in every domain of life for better opportunities that include food, education, ownership, decision making, and the power of the resources. Under strict patriarchy, only men are considered responsible to fulfill all the basic needs for their family, and women are supposed to stay inside the houses as primary caretakers for the family's health and nutrition, bearing and raising children, household management, fetching water and fodder, and fuel wood collection (Salma, et al., 2020).

In Ethiopia, except for some improvement with the current leading government, the varied and important roles played by women have not always been recognized. The discriminatory political, economic and social rules and regulations that prevail in Ethiopia have barred women from enjoying the fruits of their labor. The gender aspect in Ethiopia is characterized by women having a lower social status compared to men. As a result of the negative effect of culture and tradition, husbands do not permit women to go out

and work; if not, they will be considered as turning aside from the norm. Besides cultural obstruction, there seems to be further economic restriction among the poor uneducated women where these restrictions make it difficult for them to start even small IGAs. In many cases, having many children, coupled with the heavy daily workload at home to maintain the family, does not leave much time to venture working outside (Lailulo et al., 2015). From a young age, autonomy is promoted among boys, while girls are not given any autonomy. In their childhood, girls are trained by their family to be more obedient and dependent, focus to household chores such as cooking, in preparation for marriage and caring for their households (Haregewoin and Emebet, 2003).

Furthermore, in Ethiopia, low educational attainment is the other promising cause and consequence of females' low socio-economic status. Traditional gender roles that define men as breadwinners and establish a gendered division of labor of "breadwinning men and homemaking women (Qing, 2020) is a serious problem negatively contributing to low socio economic status of women in the country. This influences gender segregation and income inequality through occupational preferences or values (Qing, 2020). Due to cultural norms, religious prescriptions, and practices identified for women, their status and role differ which enormously restrict the accessibility of opportunities to women (Khan, 2021). Women's education is usually lower than that of men and until this gap is bridged, it will be difficult for women to be empowered (Ethiopian Society of Population Studies, 2008). One of the major reasons that women (or young girls) are not empowered through higher levels of education is the issue of early marriages (Haregewoin and Emebet, 2003; Santhya et al., 2008). Children (young girls) are married off and this has some serious implications on their development and empowerment (Santhya et al., 2008). In addition to this, lack of access to productive resources particularly land, and lack of access to employment are other factors contributing to low socioeconomic status of the women (Ogato, 2013). Without equal opportunities, they have lagged behind men in all fields of self-advancement (Gemechu, 2008). Considerable researches previously conducted in this field gave much emphasis on the contribution of entrepreneur women and factors affecting their performances (Abdi, 2014; Getu, 2015; Haxhiu, 2015; Stokes et al., 2015) and they ignore to examine further what determine women participation in income generating activities. Moreover, the main gap of these studies is that they gave entire focus on women who already have started business activities. To fill these study gap, in this study we focus on examining what factors positively or negatively determine women's participation in income generating activities.

Theoretical framework

Since the second half of the twentieth century, the issue of women's empowerment has gained importance among scholars of universities, and on national and international platforms. But the concept was not deeply ingrained into the governments' policies and programs until the declaration of the 'Women's Decade' in 1975 (Mandal, 2013). Women's empowerment is an important goal in achieving sustainable development worldwide (Huis, 2017). Income generating activity which is one of the mechanisms that can be used to empower women has a potential to uplifting them through economic decision-making, increasing their mobility, increases their access to resources, and control over resources (Aboukhsaiwan, 2014). In line with this, United Nations and its agencies

have encouraged the world community to discourage the gender stereotypes and to strengthen the status of women within the family and in society as whole (Varghese, 2021). Empowering women through income generating activities enhances economic development of their families, society and country too. Women empowerment and economic development are closely related: in one direction, development alone can play a major role in driving down inequality between men and women; in the other direction, empowering women may benefit development (Duflo, 2012).

Participation of women in income generating activity is key rout to bring women empowerment through increasing their economic development. Women's economic empowerment is the most important factor that contributes to equality between women and men (SIDA, 2009). Women's economic empowerment is the process that increases women's real power over economic decisions that influence their lives. Women's economic empowerment can be achieved through equal access to and control over critical economic resources and opportunities, and the elimination of structural gender inequalities in the labor market, including a better sharing of unpaid care work (Ali, 2014).

Methodological issues

Description of the study area

Kedida Gamela, which is situated in the southern part of Ethiopia, is one of the *Woreda*s of Kembata Tembaro zone of SNNPR state. It is located 350 km southwest of Addis Ababa, the capital of the country. The *Woreda* is bordered in the South and South East by Badawacho *Woreda*, in the South West by Kachabira *Woreda*, in the West by Angacha *Woreda*, in the North by Damboya *Woreda*, and in the East by the Adilo *Woreda*. There are two agro climatic zones in the study area which is *Dega* (wet zone) 4.5% and *Weyna Dega* (mid zone) 95.5% (BOFED, 2014).

The study *Woreda* has a total area of 10,890 hectares. As per CSA data of the 2007 census, the *Woreda* has an estimated total population of 69,645 (34,717 men and 34,928 female). The total area coverage of the *Woreda* land is 10,890 hectares, out of this cultivated land covers 82%, potentially cultivable land 0.9%, uncultivable land 4%, forest land 8% and grazing land 5.1%. Wheat, Maize, Coffee, *Teff*, root crops and false banana are the most known perennial crop in the area (BOFED, 2014) (Fig. 1).

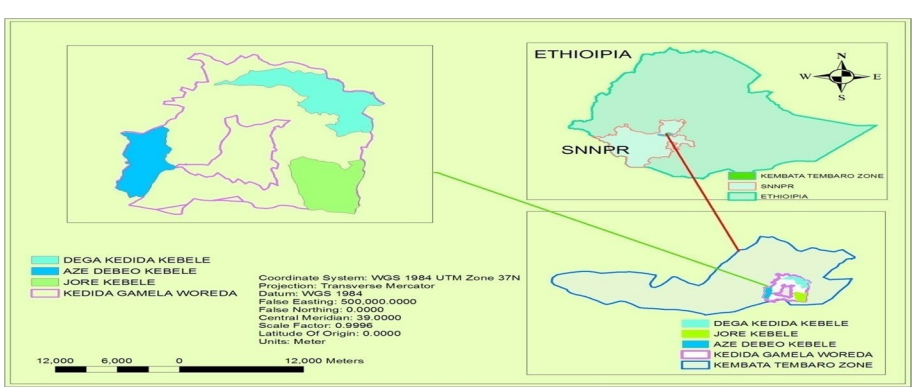

Fig. 1 Location map of the study area

Sampling procedure and sample size determination

To obtain the sample for this study, two stage sampling techniques were used. Firstly, the study *Woreda* was stratified into two based on agro ecology as wet zone and mid zone. In the second stage, among eleven *kebeles* found in the *Woreda*, three *kebeles* (one *kebele* from wet zone and 2 *kebeles* from mid zone) were selected randomly. Following this, the sample size was determined by using the formula developed by Yamane (1967). The formula is presented as follows.

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

where : $n =$ samplesize
$N =$ total respondents, $e =$ sampling error (level of precision)

$$n = \frac{763}{1 + 763(0.07)^2} = 161.$$

After total sample size determination, the sample size for each *kebele* was determined based on the proportion to the respective population size. In the second stage, representative sample from each *kebele* were selected using a simple random sampling technique.

Methods of data collection

In this study, we have used different tools to gather the required data. Interview guide for key informant interviews and questionnaire for sampled households were used to collect primary data. Before the collection of actual data, the questionnaire was pretested in 10 respondents, who were not included in the main study, to check its validity. Using the pretest results, wordings of some items were revised for the main study. For the actual data collection, three Development Agents (DAs) who can read and speak the local language were trained on the questionnaire. In addition to this, Key Informants (KIs) interview was conducted with 4 participants including 1 DA, 1 Omo microfinance agent, 1 *Woreda* women and children office expert and 1 *Kebele* leader, to obtain in-depth information about different issues related to the study objectives. The researcher guided the key informant interview. During the discussion time, recording of the discussion was undertaken with mobile phone and transcription was made after the end of each interview.

Methods of data analysis

Following data collection, the collected data were edited and made ready for data entry. Data were entered into Stata software for analysis. Based on the objectives of the study, both descriptive (frequency and percentage) and inferential statistics (Chi square and *t* test) were used to describe characteristics of the respondents across different variables. In addition, logit model was applied to analyze the determinants of women's participation in income generating activities. On the other hand, data which was obtained from key informant discussion was analyzed using narration.

Variable definition and hypothesis

Women's access to employment, business opportunities, and financial resources are widely seen as critical to achieving the United Nations Sustainable Development Goals (SDGs) over the next 15 years (Lee & Finlay, 2017). The strengthening of women's participation in all spheres of life has become a major issue in the development discourse. Socio-economic development cannot be fully achieved without the active participation of women at the decision making level in society. However, according to different literature works there are different demographic, cultural and socio economic factors that limits women participation in different economic activities. With the help of these literatures, different variables assumed to determine women participation in income generating activities were defined and hypothesized as follows.

Education status of women and husband

Education increases women's understanding and awareness of the situation in which they live, and their cognitive and psychological realm of empowerment (Bishaw, 2014). It is a powerful tool to facilitate entry in the business activities, can enhance the managerial ability of the individual, and hence increase the propensity to participate in income generating activities (Beriso, 2021). Education is a powerful tool to place women in a better position to perceive the potential benefits of adopting new innovations like participation in income generating activities (Franze and Franzel, 2012; Losindilo et al., 2010). Educated women are ready to accept every innovation to engage in business activities than the illiterate ones (Bishaw, 2014) which show education determines women's empowerment and participation in economic activities (Ekesionye and Okolo, 2012). Moreover, improving the educational level of husband is important for combating and preventing the determinants of the economic growth of women entrepreneurs (Beriso, 2021). Thus, from this, it was hypothesized that both women education and husband education would positively determine women participation in income generating activities.

Family size

Family size is associated with a household burden for women. Having fewer children will allow them greater freedom to pursue life opportunities (Upadhyay and Karasek, 2012) whereas larger family size limits women's economic advancement (Lee & Finlay, 2017). Family size exerted an opposite effect on the employment probabilities of women. According to Mussida and Patimo (2020), the larger the household, the lower the employment probabilities of women. Hence, it was hypothesized that family size negatively determines women participation in income generating activities.

Land holding

Land is one of the major factors of production in rural areas where agricultural activities are undertaken. Households relatively having large land size produce more and can generate more income that enable them to cover different livelihood related expense including food, education, health and other social duties. According to Demie and Zeray (2016), small farm size forces households to look for other sources of income for subsistence as they need additional income generating activities to generate income to cover

different family expenses. Small farmland holding does not enable the farmers to produce enough crops for satisfying their food demand and cannot get marketable surplus; this might force them to participate in additional income generating activities so as to supplement their income from such activities (Asfaw et al., 2017; Yizengaw et al., 2015). Therefore, it was expected that land size negatively determine women participation in income generating activities.

Age of the women

In different literatures, age is mentioned as a one of the major demographic factors that affect households' participation in different economic activities. In studying some factors that hinder women participation in social, political and economic activities in Tanzania, Losindilo et al. (2010) found that young women are energetic and active in participating social, economic and political activities. In line with this, it was expected that age negatively determine women participation in income generating activities.

Access to credit

Access to appropriate financial services is a fundamental condition for poverty reduction, job creation, income security and social protection. Microcredit is a potentail financial sources aims towards a minimal equality in the access to credit by allowing people excluded from the traditional financial system to take loans for creating their own jobs (Ashta et al., 2014). Women tend to have much more limited access to financial services and less opportunities for savings and credit than men. However, women who have access to financial sources are much more resilient in the face of poverty through involving in entrepreneurship and different cooperatives. Furthermore, they are much more likely to have profitability and growth than those women who have no financial access (Kring, 2017). It is believed that women entrepreneurs perform better in their businesses when they have financial accessibility. This means that women-owned enterprises with access to finance have a chance to maximize profit than credit-constrained women-owned enterprises (Alene, 2020). It is obvious that access to credit can helps women to participate in different income generating activities by using it as initial capital. Therefore, it was hypothesized that there would be a positive relationship between access to credit and women participation in income generating activities.

Access to road

Infrastructural development in rural area is one of important development activities to encourage women to move freely including accessible road construction. According to Hossain et al. (2004), limited access to road limits women to work and stay in home-based activities while men work in non-farm activities like business and transport. Considering these justifications, it was hypothesized that having access to all weather roads positively determines women participation in income generating activities.

Membership in local institutions

In rural area, local institutions are the major means to share information about different day to day life experiences among community memebers. It is a major means to deal

about business, social life, cultural entities, religion and etc. It is assumed that women who are members in local institutions are more participant in income generating activities than the others. This is because information that comes from members during different meeting may influence women to engage in income generating activities. From this it was expected that being membership in local institutions would positively influence women to participate in income generating activities.

Market distance

Participation of women in income generating activities has a tremendous potential in empowering women. It is a driving force for economic development, job creation, personal development, and self-empowerment (Kamberidou, 2013). In rural part of the study area, small markets are the major place where different transactions are undertaken. Culturally in the study area, women are not allowed to go far distance to sell and buy commodities. They have to get permission from their husband to go to the market and are expected to come back soon to their home. This discourages women to engage in income generating activities thereby forces them to stay at home. From this, it was expected that market distance negatively determine women participation in income generating activities.

Livestock holding

In rural Ethiopia, livestock is one of the major sources of livelihood where women play key role in livestock management and sell of their outputs. They play great role in improving nutrition of the poor through production of milk, meat, butter and other products (Grace et al., 2014). In association with gender division of labor, food production is considered as role of women in rural part of Ethiopia (Jiggins, 2011). As a result it is a woman who takes milk, butter to sell and buy other food items for their households from the income obtained from livestock product sell. In this research, we hypothesized that livestock ownership positively determine women participation in income generating activities because during livestock product sell, there is possibilities to share market information which may lead women to participate in income generating activities.

Model specification

According to Gujarati (2004), in estimating the logit model, the dependent variable should be dummy (participation in income generating activities in the context of this study) which takes a value of 1 for participation and 0 otherwise. The logit model was mathematically formulated as follows:

$$P_i = \frac{e^{zi}}{1 + e^{zi}}, \tag{1}$$

where, P_i is the probability of women involvement in income generating activities

$Zi =$ is a function of n-explanatory variable (xi) and expressed as:

$$Z_i = \beta_0 + \sum \beta_i X_i + u_i, \tag{2}$$

where, $\beta_0 =$ intercept. $\beta_i =$ regression coefficients to be estimated. $X_i =$ is explanatory (independent) variable. $u_i =$ disturbance term

Pi is the probability of women participation in income generating activities, and then the probability of respondents' not to participate in income generating activities $(1 - pi)$ can be written as:

$$1 - pi = 1/1 + e^{zi}. \tag{3}$$

Therefore, taking the ratio of the probability of women participation to non-participants can be written as:

$$\frac{pi}{1 - Pi} = \frac{1 + e^{zi}}{1 + e^{-zi}} = e^{zi}. \tag{4}$$

The left side of Eq. (4) $\left(\frac{pi}{1-Pi}\right)$, is simply the odds ratio in favor of women participation in income generating activities.

By taking the natural log of Eq. (4), the log of odds ratio can be written as:

$$Li = Ln\left(\frac{pi}{1 - Pi}\right) = Ln\left(e^{\beta_0} + \sum_{j=1}^{n} \beta_j x_{ij}\right) = Zi = \beta_0 + \sum_{j=1}^{n} \beta_j x_{ij}, \tag{5}$$

where, Li is log of the odd ratio in favor of participation in income generating activities, which is not only X_{ij} linear but also linear in the parameters.

As indicated above in the model, the logit model for this particular study can be identified as follows with variables of the study.

$$\begin{aligned} Yi = &\beta 0 + \beta 1\text{AGE} + \beta 2\text{FAMLYSZ} + \beta 3\text{HOSBEDU} \\ &+ \beta 4\text{WIFEEDU} + \beta 5\text{LANDSZE} + \beta 6\text{TLU} \\ &+ \beta 7\text{MKTDST} + \beta 8\text{CREDITAC} \\ &+ \beta 9\text{MEMBERSHP} + \beta 10\text{ROADACC} + u, \end{aligned} \tag{6}$$

where: Y_i indicates participation in income generating activities and takes value 1 for participants and 0 non-participants, β0 is intercept and ů is the error term. Summary of variables is presented in Table 1 below.

Table 1 Description of variables used in the logit model

Code	Variable description and measurement	Hypothesis
PARTICPATION	Participation in income generating activities (1 for participants and 0 for non-participants)	
AGE	Age of the respondents in years	−
FAMLYSZ	Family size of the respondent household in number	−
HOSBEDU	Educational attainment of the husband in years	+
WIFEEDU	Educational attainment of the wife in years	+
LANDSZE	Land holding in hectare	+
TLU	Livestock holding in Tropical Livestock Unit	+
MKTDST	Distance to the main market in kilometer	−
CREDITAC	Access to credit (1 if the respondents have access to credit and 0 otherwise)	+
MEMBERSHP	Membership in local social institutions (1 for members and 0 otherwise)	+
ROADACC	Access to all weather road (1 if the respondents have access to all weather road and 0 otherwise)	+

Results and discussion

Descriptive statistics

This sub section has been discussed by using descriptive statistics outputs. For the simplicity of understanding, separate discussions were made for the continuous and dummy variables. By applying descriptive statistics such as mean, standard deviation, percentages and frequency distribution, the characteristics of sample households are presented as follows.

The mean age of respondents engaged in income generating activities was found to be 41.36 years and it was 47.85 years for those who were not engaged in income generating activities. The result of *t*-test analysis shows that there was a significant mean difference between two groups at 1% statistically significant level. This means participants in IGAs are younger than the non-participants. Average family size of the respondents engaged in income generating activities was found to be 4.75 and it was 5.91 for non-participants. The analysis of *t*-test shows that there was statistically significant difference between two groups in their family size at 1% significance level. This implies that women with larger family size are less involved in income generating activities compared to women with smaller family size.

The mean schooling years of husbands of women engaged in income generating activities was 5.8 years and for those who were not engaged in income generating activities was 2.55 years. The *t*-test result indicates that there was a significant mean difference in husband's schooling years between two groups at a 1% significance level. Husbands of women participating in IGAs had more years of schooling than the husbands of non-participating women in IGAs. Moreover, it was revealed that on average, participant women attained 3.7 schooling years and that of non-participants 0.807 years. This shows that participants in income generating activities have more schooling years than the non-participants which are evident with the t-test result showing a significant difference between the two groups at a 1% significance level.

The survey result further indicated that the mean land holding of the overall respondents was 0.51 ha with a standard deviation of 0.24 ha. As indicated in Table 2 below, it was found that there was no significant mean difference in land holding between two groups (*t*-value 1.29).

As indicated in Table 2, sample households had an average of 3.47 livestock holding measured in tropical livestock units. The mean tropical livestock unit of income generating activities' participants was 3.62 while it was 2.39 for non-participants. This was

Table 2 Summary of descriptive statistics (continuous variables)

Variable	Participants		Non participants		Total household		*t* test
	Mean	STD	Mean	STD	Mean	STD	
Age	41.37	5.8	47.85	9.2	45.55	8.7	4.7***
Family size	4.75	1.61	5.91	1.28	5.44	1.49	4.5***
Education (husband)	5.8	3.1	2.55	2.2	3.73	3.04	7.7***
Education (wife)	3.7	1.98	0.8	1.13	1.13	1.13	11.8***
Land holding	0.48	0.24	0.53	0.24	0.51	0.24	1.29
Livestock	3.62	1.13	2.39	2.07	3.47	1.79	0.73
Market distance	1.79	0.79	3.73	1.44	3.05	1.56	0.73

***$p < 0.01$

insignificant with a *t*-test value of 0.7. In the study area, on average income generating activities participants are expected to travel 1.79 km to access nearest market while the non-participant group need to travel 3.73 km to reach to the nearest market place. The result of the *t*-test analysis shows that the mean nearest market difference between the two groups was found to be statistically insignificant.

During the survey time, women were asked to report whether they are members of any social organization in their localities or not. Accordingly, among the sampled respondents, about 24.22% of them were members in one of the social organizations operating in their locality while the rest 75.78% of them weren't. About 47.37% of women who engaged in income generating activities were members in one of the social organizations operating in their locality while the rest 52.63% were not (Table 3). Majority (88.46%) of the women who are non-participant in income generating activities were not taking part in activities of social organizations. The result of chi-square analysis presented in Table 3 shows that there was a significant association between participation in income generating activities and being member in social organizations.

Moreover, the survey result presented in Table 3 depicts that, in the study area, about 20.5% of women had received credit from formal microfinance institutions during the last 5 years while the majority of them hadn't. About 42.11% of women who are engaged in income generating activities received credit. On contrary to this, only 8.65% of the respondents from the non-participant group received credit. The result of Chi-square analysis shows that there is a significant association between receiving credit and participation in income generating activities at a 1% significance level.

It is obvious that access to road is crucial infrastructure to travel easily from one place to the other to carryout important livelihood activities. In the study area, it was found that majority of the respondents had no access to road that helps them to travel easily regardless of the whether condition. From total sampled households, 75.16% of them had no access to road. With regard to the participation status of respondents in income generating activities by access to road, it was found that 68.42% of women participating in income generating activities had no access to road. The chi-square test analysis showed that, there was no statistically significant difference in the access to road between participants of income generating activities and non-participant households.

Table 3 Summary of descriptive statistics (categorical variables)

Variable		Participants		Non participants		Total household		Chi-square
		n	%	*n*	%	*n*	%	
Member in social institutions	Yes	27	47.37	12	11.54	39	24.22	25.75***
	No	30	52.63	92	88.46	122	75.78	
Access to credit	Yes	24	42.11	9	8.65	33	20.5	25.28***
	No	33	57.89	95	91.35	128	79.5	
Access to road	Yes	18	31.58	22	21.15	40	24.84	2.14
	No	39	68.42	82	78.85	121	75.16	

***$p < 0.01$

Types of income generating activities women engaged in

In the study area, it was found that among the sample respond households only 35.4% of them were engaged in income generating activities where as 64.6% of them didn't take part in any income generating activities (Fig. 2). The survey result further depicted that these respondents who were participants in income generating activities were found to be engaged in more than one income generating activities (Table 4).

The result presented in Table 4 depicted that among the respondents who were participants in income generating activities, 83% of them were engaged in livestock product sell. Vegetable and fruit sell was the other activities women were engaged in as one of the income generating activities for them. Poultry trading was also found to be the other key activities women taking part in as one of the income generating activities (Table 4).

Moreover, it was also found that 45% of women participated in petty trade activities like selling salt, chilly paper and other small commodities. In the study area, women were engaged not only in agricultural activities, but they were also participating in wage labor and hair dressing activities.

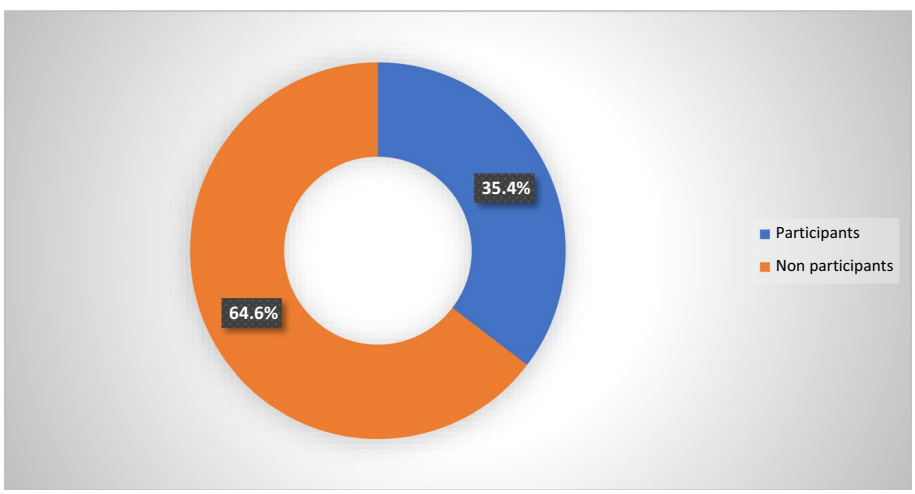

Fig. 2 Women participation status in income generating activities

Table 4 Types of income generating activities women engaged in

Types of IGA	Percentage
Poultry trade	34
Vegetable and fruit sell	45
Livestock product sell	83
Wage labor	18
Petty trade	45
Hair dressing	12

Table 5 Determinants of women participation in income generating activities

Particpation	Odds ratio	Coeff.	Std. err	*z*	*p*-value
AGE	0.875164	− 0.1333439	0.0733164	− 1.82	0.069*
FAMLYSZ	0.3337696	− 1.097304	0.4923591	− 2.23	0.026**
HOSBEDU	2.598739	0.9550262	0.3473094	2.75	0.006***
WIFEEDU	8.21352	2.105782	0.6967967	3.02	0.003***
LANDSZE	0.0004376	− 7.734188	3.116014	− 2.48	0.013**
TLU	2.742897	1.009015	0.4465734	2.26	0.024**
MKTDST	0.103929	− 2.264047	0.6631291	− 3.41	0.001***
CREDITAC	83.86311	4.429186	1.799359	2.46	0.014**
MEMBERSHP	1.204836	0.1863436	1.762573	0.11	0.916
ROADACC	7.476151	2.011718	1.457784	1.38	0.168
_cons	3778.597	8.237108	3.885145	2.12	0.034

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

Determinants of women participation in income generating activities

The logistic regression result in Table 5 revealed that there were different variables that determine women decision to participate in income generating activities at different statistical significant levels. Ten variables were hypothesized that were assumed to determine woman's participation in income generating activities. Among them, eight of them were found to be significant variables in determining women participation in income generating activities either positively or negatively while the rest two were insignificant in explaining the variations in the dependent variable. Accordingly, age, husband's education, women's education, family size, land size, market distance, livestock holding and access to credit were variables identified by logistic regression model that influence women decision to participate in different income generating activities. They are explained as follows.

Educational level of husband and women

Looking into the output of logistic regression (Table 5), it was found that educational level of husbands and women themselves determines participation in income generating activities at a 1% significance level. The odds ratio of husband's education indicates that as the schooling year of the husbands increase by 1 year, the possibilities for women to participate in income generating activities increases by 2.59 units keeping the other factors constant. The possible reason for this is that as the educational level of the husbands increases their understanding about gender equality increases and motivates women to move freely, including participation in income generating activities. Moreover, the odds ratio analysis result also shows that as the educational level of women increases by one year, their possibilities to be engaged in income generating activities increase by 8.21 units keeping the other factors constant. This can be reasoned out as the schooling year of the women increases their confidence increases and they are able to think different things in different ways to change the livelihood of their households including participating in income generating activities. Moreover, as education increases the capability to manage income generating activities like cost benefit analysis, profit calculation increases which helps them to decide to take part in different income generating activities. The result of a study conducted by (Onyebu, 2016) is in agreement with

the finding of this study. The study shows that education was positive and significantly related to income generating activities at a 1% level of probability. Furthermore, Minot et al., (2006) also stress education enhances the potential of the respondents and makes them take advantage of available opportunities that could enhance their activities.

Market distance

The result of logistic regression further indicates that market distance affects women's participation in income generating activities negatively and significantly at a 1% significance level. From the odds ratio analysis result, it was evidenced that as the market distance is far from the residence home by one- kilo meter, the possibilities to participate in income generating activities decreases by 0.103 units keeping the other factors constant. The reason for the negative relationship between market distance and women participation in income generating activities is that, long distance takes time for the women to reach to market place to buy input for their business and sell their output. As women have a lot of household related burden, they are not much interested to go a long distance and waste their time. This is in agreement with Montanari and Bergh (2019).

Access to credit

IN the study area access to credit determines the possibilities to participate in income generating activities positively and significantly at a 5% significance level. The result of logistic regression also shows the odds ratio favoring participation in income generating activities by a factor of 83.86 for those households who have received credit. The reason for this is that access to credit solves the startup capital shortage of women and helps them to participate in income generating activities easily. The result of a study conducted by Yusuf et al. (2015) in Nigeria shows that access to credit was significant at a10% level of probability in determining participation in income generating activities. According to the study, this implies that a unit increase in this factor could lead to an increase in women's involvement in income generating activities. This may be because their access to credit is likely to facilitate them to invest more in their activities.

Family size

IT was depicted that family size negatively determines women's participation in income generating activities at 5% significance levels. Based on the odds ratio result, as the family size of the respondents' household increases by one individual, women's possibilities to be engaged in the income generating activities decrease by 0.33 units keeping the other factors constant (Table 5). The reason for the negative relationship between family size and women's participation in income generating activities is that as the family size increases the workload for women associated with children care increases and consumes their time that could have been invested in income generating activities. This is in line with (Lechmann & Schnabel, 2012) who found women work fewer hours in self-employment than men and their working time scheduling is far more flexible.

Land size

The result of logistic regression model shows that land holding negatively determines women's participation in income generating activities at 5% significance levels. It was

found that as the landholding of the respondents' increases by one hectare, women participation in income generating activities decreases by 0.0004 units keeping the other factors constant (Table 5). This is because as the land size increases, the income obtained from agricultural production increases and the possibilities for women to search for additional income decreases as they have no income problem because they can get it from agricultural production activities.

Livestock holding

Based on the output of the logistic regression model, livestock holding determines women's probability to participate in income generating activities positively and significantly at a 5% significance level. As the livestock holding of the respondent households increases by a unit TLU, the possibilities for women to be engaged in income generating activities increases by 2.74 units keeping the other factors constant (Table 5). The possible reason for this could be in the study it is the responsibility of women to sell livestock products like milk, butter, yogurt in the market. This helps them to get the chance to collect market information about income generating activities.

Age

IT was found that age negatively determines women possibilities of being engaged in income generating activities at a 10% significance level. The odds ratio result shows that as the age of the women increases by one year, the possibilities of being engaged in income generating activities decrease by 0.87 unit keeping the other variables constant (Table 5). The possible reason for this is as the age of women increases, their possibilities to actively engage in income generating activities decrease because with older age energy needed to carry out the activities decreases.

Conclusions

This study analyzed determinants of women participation in income generating activities in rural Ethiopia. In addition, the study had also identified types of income generating activities women engaged in. In the study area, among sampled households, about 35.4% of them were engaged in different income generating activities. Vegetable and fruit sell, poultry, petty trade, hairdressing and wage labor were activities women engaged in. These income generating activities are not strong to generate enough income and are categorized as women's businesses in the study area. This shows that high income earning activities are dominated by males in the study area. Furthermore, empirically it was found that age, husband's education, women's education, family size, land size, market distance, livestock holding and access to credit were significant variables determining women participation in income generating activities. The policy implication of this finding is that investment in credit expansion, education, expansion of market, livestock production are crucial to promote women participation in income generating activities.

Abbreviations

IGAs	Income generating activities
DAs	Development agents
KI	Key informant

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Author contributions
AA Developed the proposal, has made analysis and written the original draft, Dr. TW, supervise data collection, feeds data and supports analysis, AKA collected data, interpret and support the writing of the original draft. All authors read and approved the final manuscript.

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