Determinants of Women Participation in Income Generating Activities: Evidence from Ethiopia

Abera Alemu1, Tesfaye Woltamo2 and Aklilu Abuto3

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's practical evidence. To carry out this study both primary and secondary data was collected and analyzed. Randomly selected 161 households were the source of primary data for this study. Secondary data was collected from the review of related works of literature. A binary logistic regression econometric model was implemented to identify major determinants of women's participation in income-generating activities. Women in the study area are not allowed by their husbands to participate in high-income earning activities. They are considered as a housewife and the only husband is expected to participate in high income-generating activities due to the local customs. As a result, some women participate in small business activities like livestock product sales, vegetable and fruit sell, poultry, petty trade, hairdressing, and wage labor. 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 on 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 are more than half of the world population (Gashaw, 2015). Women and development issues 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 is crucial mechanism for insuring rural development of developing countries. Institutions and individuals promoting rural development should see income generating activities as a strategic development intervention that could accelerate the rural development process (Akerele and Aihonsu, 2011). Over the past four decades women entrepreneurship has gained popularity around the world with a growing number of females to start and run their own business (Endalew, 2020). Now a days feminist studies in the academic arena and other initiatives in the world promote empowering women has led to a desire to learn more about businesses that are owned and run by females. In addition, the role of women in this 21st century is not just limited to domestic activities

or as house wives. Rather, the roles are changing, women are assumed to find a balance between being a wife, a mother, at the same time an entrepreneur (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).

Worldwide both women and men play different roles and perform different responsibilities concerning livelihood of their households. However both genders are income earners but 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). Alaba and Adeniyi, (2014) argued that in rural areas, women perform a key role as food producers (paid and unpaid worker), income earner, food utilizer and household managers for their families but they had limited access to productive resources like education, health, training and employment opportunities etc. In this regard, Kishwar et al., (2018) presented that women constantly prioritize household food needs and always spend more income on food needs as compared to men (Madiha, et al., 2020).

The role of women in income generating activities is of paramount importance to economic development of their household. In developing countries, however, women are not economically free, especially in rural areas. It is very rear case that women walk against their male's guardian decision because they are depended on their husband's income (Paul, 2019). Consequently, recognizing 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 resources (Yusuf et al., 2015). The dynamic changes in 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 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 work is also under valued 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 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, a lack of education and skills, wrong interpretations, the honor associated with the 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 some improvement with current leading government, however, the varied and important roles they play have not always been recognized. The discriminatory political, economic and social rules and regulations prevail in Ethiopia have barred women from enjoying the fruits of their labor. Without equal opportunities they have lagged behind men in all fields of self-advancement (Gemechu 2008). As to the understanding of the researchers, although there are no studies that have been conducted in the study area in this field, considerable researches previously conducted focused on the contribution of entrepreneur women and factors affecting their performances (Abdi, 2014; Getu, 2015; Haxhiu, 2015; Stokes *et al.*, 2015). The main gap of these studies is that they gave focus on women already started business activities. To fill this study gap in this study we focus on examining what factors positively or negatively determine women participation in income generating activities.

Methodological Issues
Description of the Study Area

Kedida Gamela, which is situated in the southern part of Ethiopia, is one of the Woreda of Kembata Tembaro zone of SNNPR state. It is located at 350 km south west of Addis Abeba and 125 Km North West of Hawassa, the capital city of the SNNPR. 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. It lies between 70 11'N to 70 19'N and 37050' 30"E to 380 4' 30"E. The altitude of the Woreda varies from 1700 to 3028 meter high above sea level (BOFED, 2014). There are two agro climatic zones in the study area which is Dega (wet zone) 4.5% and Weyna Dega (mid zone) 95.5 %. According to thirty years climatic data of the Woreda, the mean annual rainfall of the Woreda ranges from 572-1522 mm with the average of 986 mm, meanwhile the mean annual temperature for the Woreda in average is 24.50C (BOFED, 2014). The study Woreda has a total area of 10,890 ha. As per CSA data of 2007 census, the Woreda has an estimated total population of 69,645. From these 34,717 are men and 34,928 are female. The total households of the study area are 9,849. The Woreda comprises 11 Keble administrations. All of them are rural *Woreda* (BOFED, 2014).

The total area coverage of the Woreda land is 10,890 hectare, out of this cultivated land covers 82 %, potentially cultivable land 0.9 %, uncultivable land 4 %, forest land 8%, grazing land 5.1%. Wheat, Maize, Coffee, Teff, root crops and Enset are the most known perennial crop in the area (BOFED, 2014).The rainfall of the Woreda is bimodal. The small rainy season begins in January and ends at May. The main rainy season (Kiremt) starts in June and extends to September but the main rainfall occurs in July and August. (BOFED, 2014)
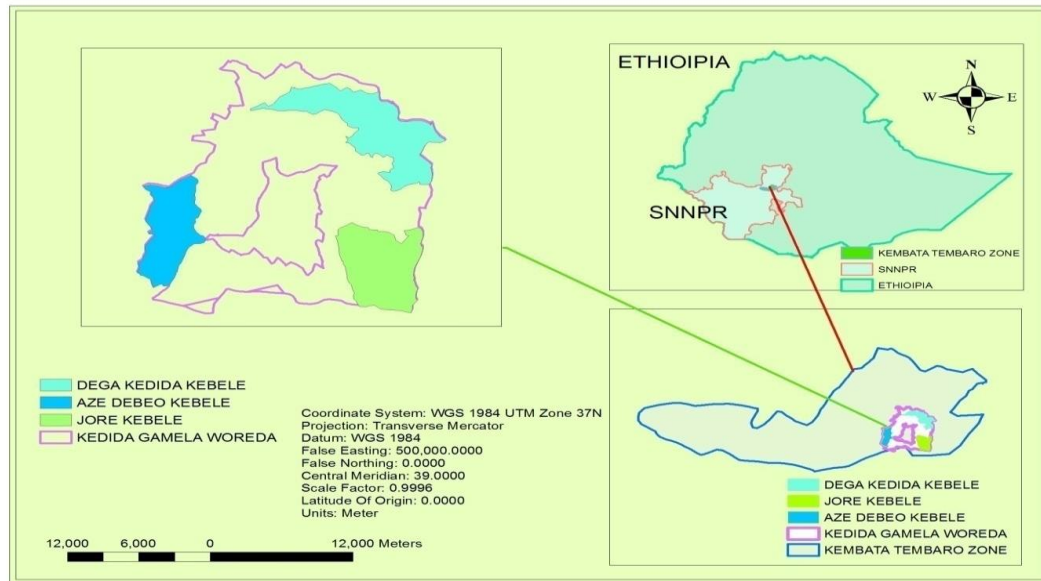
Figure 1: Location map of the study area

Research Design

Cross-sectional Survey design was used as a research design for this particular study. Mixed methods of data, both quantitative and qualitative data, were collected and analyzed in the study.

Sampling Procedure and Sample Size Determination

The study was conducted in Kedida Gamela woreda which was purposively selected for the study. The reason for selection of Kedida Woreda for study was that the researcher has lived and worked several years in the Woreda and he noticed problems and opportunities of women's income generation. To obtain the sample for the survey, a two stage was used. Firstly, study Woreda was stratified into two based on agro ecology as Dega zone and Woyenadega Zone. In the second stage among the existing eleven 11 *Woreda*, three *Woreda* (One Kebele from Dega and 2 *Woreda* from Woyenadega agro ecology) were selected randomly. Following this, sample size was determined by using formula developed by Yamane (1967). The formula is presented as follows.

$$n = \frac{N}{1+N(e)^2} \text{Where: } n = \text{Sample size}$$

N=Total Respondents

e=Sampling Error (Level of Precision)

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

$$=161$$

After sample size determination, sample size for each *Woreda* was determined based on the proportion to the respective population size. In the second stage representative sample from each *Woreda* were selected using simple random sampling technique (lottery method).

Methods of Data Collection

In this study we have used different tools to gather the required data. Interview guide for key informant interview, 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 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 agents, 1 Woreda women and children office expert and 1 Kebele leader to obtain in-depth information about different issues related with the study objectives. The researcher guide key informant interview. During the discussion time, recording of discussion was undertaken with mobile phone and transcription was made after end of each interview.

Methods of Data Analysis

Following data collection, the collected data was edited and made ready to data entry by using stata software. Based on objectives of the study, both descriptive like, frequency and percentage distribution was used and inferential statistics like chi square and t test was used to see the difference between the involvements of women's in income generating activities across discrete and continuous explanatory variables of the study. 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.

Model specification

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

$$P_i = \frac{e^{zi}}{1+e^{zi}} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where, Pi is the probability of women involvement in income generating activities

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

$$Z_i = \beta_0 + \sum \beta_i X_i + u_i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

Where, β_0= Intercept

β_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' unvolvement in income generating activities (1-pi) can be written as:

$$1\text{-pi}=1/\ \mathbf{1}+e^{zi} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.. \ (3)$$

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

$$\frac{\mathbf{pi}}{\mathbf{1-Pi}} = \frac{\mathbf{1}+e^{zi}}{\mathbf{1}+e^{-zi}} = e^{zi} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots............\dots. \ (4)$$

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

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

$$\text{Li}= \text{Ln}\ (\frac{\mathbf{pi}}{\mathbf{1-Pi}}) = \text{Ln}\ (e^{\beta 0+\sum_{j=1}^{n}\beta_j x_{ij}})=Z_i=\beta o+\sum_{j=1}^{n}\beta j x_{ij}\dots\dots\dots\dots\dots\dots\dots\dots\dots... \ (5)$$

Where, Li is log of the odd ratio in favor of participation in income generating activities, which is not only Xij linear in 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

$$\text{Yi}=\beta 0+\beta 1\text{AGE}+\beta 2\text{HOSBEDU}+\beta 3\text{WIFEEDU}+\beta 4\text{FAMLYSZ}+\beta 5\text{LANDSZE}+\beta 6\text{MKTDST}+\beta 7\text{TLU}+\beta 8\text{CREDITAC}+\beta 9\text{MEMBERSHP}+\beta 10\text{ROADACC}+\mathring{u}\dots\dots\dots\dots\dots..\dots\dots\dots\dots\dots \ (6)$$

Where: Y_i indicates participation in income generating activities and takes value 1 for participants and 0 non-participants, $\beta 0$ is intercept and $\mathring{u}$ 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
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
Descriptive statistics

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

Age of the respondents: From Table II below, it is revealed that the maximum age of the respondents was 66 years, and the minimum was 21 years. The mean age was identified to be 45.55 years with standard deviation of 8.7 years. The mean age of respondents engaged in income generating activities was found to be 41.36 years and where as it was 47.85 years for those who are 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.

Family size of the respondents' household: As shown on Table 1 the average family size of the entire sample household was 5.44 with standard deviation of 1.49 where the minimum size was 1 and the maximum was 8 individuals. The average family size of the respondents engaged in income generating activities was found to be 4.75 with standard deviation of 1.61 and 5.81 for those who are not engaged in income generating activities with standard deviation of 1.28. The analysis of t-test shows that there was statistical significant difference between two groups in their family size at 1% significance level. This implies that women in households with larger family size less involved in income generating activities compared to women in households with smaller family size.

Educational level of the husbands: In the study area the minimum schooling years of the

respondent's husband was 0 and the maximum schooling year was 13. The maximum schooling year of husband of women who are engaged in income generating activities and not engaged in income generating activities was 13 and 12 years respectively. Based on the survey result obtained, the mean educational level of husbands of women engaged in income generating activities was 5.8 years and for those who are not engaged in income generating activities was 2.55 years. The mean analysis result indicated in Table 2 below shows there was statistically significant mean difference between two groups at 1% significance level. The t-test result indicates that there was significant mean difference in educational level in schooling years between two groups at 1% of significance level. Husbands of women participating in IGAs had more years of schooling than the husbands of non-participating women in IGAs.

Educational status of the respondents: The survey result presented in Table 6 below depicts that sample household on average have attained 1.13 schooling years. The maximum schooling years observed was 8 while the minimum was 0. The mean schooling years of participants in income generating activities was 3.7 and that of non-participants was 0.807. This shows that income generating activities participants have more schooling years than non-participants. The result of t test conducted to test whether there was significant mean difference between income generating activities participants and non-participants with regard to schooling years shows that there was significant mean difference between them at 1% significance level.

Land holding of the respondents: In the study area it was found that the mean land holding of the respondents was 0.514 hectare with standard deviation of 0.244 hectare. The minimum and maximum land holding of the total households was 0.12 hectare and 1.65 hectares respectively. The mean land holding of respondents engaged in income generating activities and those who are not engaged in income generating activities was 0.48 and 0.53 hectare respectively. T test was conducted to examine whether there was significant mean difference in land holding between two groups. As indicated in Table 3 below, it was found that there was no significant mean difference in land holding between two groups.

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

Livestock holding of the respondents

Livestock are among important assets in livelihood of rural people. They are source of income, power, organic fertilizer and food for people. For the simplicity of analysis, number of livestock owned by respondent households was converted into Tropical Livestock Unit. As indicated in Table 2, sample households in the study area have an average of 3.47 tropical livestock unit. The mean tropical livestock unit of income generating activities' participants was 3.62 while it was 3.39 for non-participants. The t- test output in the Table 2 indicates that there was no statistically significant mean difference between IGA participants and non-participants in terms of number of livestock owned measured in tropical livestock unit.

Market distance

In the study area, women are expected to travel average 3.05 Km to the nearest market to sell some agricultural products and buy different commodities for their households. The average market distance from residence to the participants women in income generating activities was 1.78 km and it was 3.73 km for non-participant group. The maximum distance from the respondent's residence to the nearest market for participants and non-participants was 4 and 6 Km respectively. The result of t-test analysis shows that the mean difference between two groups was found to be statistically insignificant.

Respondents' membership in social organizations

During the survey time women were asked to report whether they are members in any social organization in their localities or not. Accordingly among the sampled respondents about 24.22% of them are members in one of the social organizations operating in their locality while the rest 75.78% of them aren't. About 47.37% of women engaged in income generating activities are members in social organizations operating in their locality while the rest 52.63% are not members (Table 3). Majority (88.46%) of the women who are non-participant in income generating activities were not taking part in social organizations activities. The result of chi square analysis presented on Table 10 shows there was significant association between participation in income generating activities and being member in social organizations.

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	

Respondents use of credit

The survey result presented on 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 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 non-participant group received credit. The result of chi square analysis shows that there is significant association between receiving credit and participation in income generating activities at 1% significance level.

Access to road

It is obvious access to road is very important infrastructure to transport easily from place to place to take part in 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 rad, 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 in income generating activities and non-participant households.

Types of Income Generating Activities Women Engaged In

During the survey time, respondents were requested to whether they are taking part in income generating activities to improve their livelihood. Accordingly among total sampled households about 35.4% of them were engaged in different income generating activities. It was observed that majority of the respondents were engaged in multiple income generating activities. It was found that about 83% of them were engaged in livestock product sell particularly butter. 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 were participated in petty trade activities like selling salt, chilly paper and other small commodities. In the study area females were engaged not

only in agricultural activities, but they were also participating in wage labor and hair dressing. Accordingly about 18% of them were engaged in wage labor (Table 4). It was found that women who have limited land size and unable to meet the demand of family look at another option. In the study area most of time women engage in *Enset* processing as a labor work paid daily.

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

Source: Own survey, 2020

Determinants of Women Participation in Income Generating Activities

The logistic regression result in the Table 5 below revealed that there were different variables that determine woman's' decision to participate in income generating activities at different statistical significant levels. Ten variables were hypothesized that assumed to determine woman's' participation in income generating activities. Among them, eight of them were found to be significant variables determine woman's' participation in income generating activities either positively or negatively while the rest two variables were not significant in explaining the variations in the dependent variable. 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 woman's decision to participate in different income generating activities. They are explained as follows.

Educational level of husband and women: Looking into output of logistic regression (Table 5), it was found that educational level of husband and women themselves determine participation in income generating activities at 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 increase by 2.59 units keeping the other factors constant. The possible reason for this is 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 the are able to think different things in different ways critically to change the livelihood of their households including participating in income generating activities. Moreover, as the 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 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 participation in income generating activities negatively and significantly at 1% significance level. From the odds ratio analysis result it was evidenced that as the market distance 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 negative relationship between market distance and women participation in income generating activities indicates, long distance takes time for the women to reach the market to sell and buy commodities focused on their income generating activities. As women have a lot of household related burden they are not much interested to go a long distance and waste their time.

Table V. Determinants of women participation in income generating activities

PARTICPATION	Odds Ratio	Coef.	Std. Err.	z	p-value
AGE	.875164	-.1333439	.0733164	-1.82	0.069*
FAMLYSZ	.3337696	-1.097304	.4923591	-2.23	0.026**
HOSBEDU	2.598739	.9550262	.3473094	2.75	0.006***
WIFEEDU	8.21352	2.105782	.6967967	3.02	0.003***
LANDSZE	.0004376	-7.734188	3.116014	-2.48	0.013**
TLU	2.742897	1.009015	.4465734	2.26	0.024**
MKTDST	.103929	-2.264047	.6631291	-3.41	0.001***
CREDITAC	83.86311	4.429186	1.799359	2.46	0.014**
MEMBERSHP	1.204836	.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

Source: Own survey, 2020   ***, ** and * significant at 1%. 5% and 10% level respectively

Access to credit: In the study area access to credit determine the possibilities to participate in

income generating activities positively and significantly at 5% significance level. The result of logistic regression also shows that 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 these positive relationships can be explained as 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 10% 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 increase in women involvement in income generating activities. This may be because their access to credit is likely to facilitate them to invest more on their activities.

Family size: It was depicted that family size negatively determine women 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 negative relationship between family size and women participation in income generating activities shows 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.

Land size: The result of logistic regression model further shows that land holding negatively determine women participation in income generating activities at 5% significance levels. Based on the odds ratio result, as the land holding of the respondents' increases by one hectare, women participation in income generating activities decrease by 0.0004 units keeping the other factors constant (Table 5). 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 as they can get it from agricultural production activities.

Livestock holding: Moreover, it was found that livestock holding determine women probability to participate in income generating activities positively and significantly at 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 responsibilities of women to sell livestock products like milk, butter, yoghurt in the market. This helps them to get the chance to collect market information about income generating activities.

Age: Lastly, the result of logistic regression also shows age as one of the determinant facts affecting women participation in income generating activities. Accordingly it was obtained that age negatively determine women's possibilities to be engaged in income generating activities at 10% significance level. The odds ratio shows that as the age of the women increase by one year the possibilities to be engaged in income generating activities decrease by 0.87 factors keeping the other variables constant (Table 5). The possible reason for this is as age of women increases their

possibilities to be 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 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, hair dressing and wage labor were the other activities women were engaged in as the other income generating activities for them. From this it was concluded that in the study area although the participation of women in income generating activities is low, those who were engaged in it found to be participating in multiple income generating activities where selling livestock product was the most dominant means of income earning for women 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

Authors' contributions

AA Developed the proposal has written the original draft, Dr. TW, supervise data collection, feed data and made analysis, AKA collected data, interpret and write original draft. All authors read and approved the final manuscript.

Funding

Availability of data and materials

Will be supplied from the corresponding author up on the request

Competing interests

The authors declare that they have no competing interests.

Author details

1, 2 and 3 Faculty of Environment, Gender and Development Studies Hawassa University, College of Agriculture

References

Abdi Ibrahim Farah. (2014), "Factors Influencing Women Participation in Entrepreneurial Activities in Mandera Township, Mandera Central Division, Kenya", unpublished manscript , A Research project submitted in partial fulfillment of the requirement for the degree of master of arts in project planning and management, school of continuing and distance education, university of Nairobi.

Akehurst, G., Simarro, E., & Mas-tur, A. (2012), "Women entrepreneurship in small service firms : motivations, barriers and performance". The Service Industries Journal, Vol. 32, No.15, pp.2489–2505.

Akerele E. O. and Aihonsu J.O.Y. (2011), "Determinants of Women's Participation in Entrepreneurship Development in Yewa North Local Government Area, Ogunstate, Nigeria",Nigerian Journal of Agricultural Economics, Vol. 2, No 1, pp 68- 78

BOFED (2014), "Office of Finance and Economic Development, Dale Woreda".

Boserup, E., Fei, S.T. & Toulmin, C. (2013), "Woman's Role in Economic Development", Routledge publishers, New York:NY.

Butt, T.M.; Hassan, Z.Y.; Khalid, M.; Sher, M. (2010), Role of rural women in agricultural development and their constraints. Journal of Agriculture & Social Sciences, Vol.6, No.3, pp.53–56.

Edona Haxhiu. (2015.), "Factors affecting success and performance of women entrepreneurship in Kosovo", unpublished manuscript, master's thesis, university of Ljubljana

Endalew Terefe Alene, (2020), "Determinants that Influence Women Entrepreneurs Performance in Ethiopia", Vol. 9, No. 24,pp.1-20

Everleigh Stokes, Carlye Lauff, Evan Eldridge, Kathryn Ortbal, Abdalla Nassar and Khanjan Mehta, (2015),. "Income Generating Activities of Rural Kenyan Women", Journal of Sustainable Development, Vol. 8, No. 8; doi:10.5539/jsd.v8n8p42

Fontana M, Paciello C. (2010), "Gender dimensions of agricultural and rural employment: Differentiated pathways out of poverty", FAO, Rome.

Food and Agricultural Organisation (2010), "Women in infrastructure works: Boosting gender equality and rural development. Gender and Rural Employment Policy Brief"

Gashaw Ayferam. (2015), "Assessment of the Roles and Constraints of Women in Economic

Development of Ethiopia: The Case of Ambo Town since 1991", Journal of Political Sciences & Public Affairs, Vol.3:No.1 DOI:10.4172/2332-0761.1000148.

Gatakaa, G. C. (2012). Factors Affecting Women Entrepreneurs' Financial Performance in Kenya: A Case of Ngara Market. Research project submitted in partial fulfillment of the requirements for the degree of Master of Business Administration, School of Business, University of Nairobi, Kenya.

Gemechu S (2008), "Assessment of Gender Role in crop Production and management practice in Ambo District, Ethiopia".

George, B. (2013),"Women play a decisive role in household food security, dietary diversity and children's health". Gender dimensions of food security and nutrition. Food and agriculture organization of the United Nations

Getu Girma, 2015. "Factors Affecting the Performance of Women Entrepreneurs in Micro and Small Enterprises in Gulele Sub-City", Addis Ababa, unpublished manuscript, Addis Ababa University

Gujarati, D.N. (2004), Basic Econometrics. 4th Edition, McGraw-Hill Companies.

Isran, S.; Isran, M.A, (2012), "Patriarchy and women in Pakistan: A critical analysis", Interdiscip. J. Contemp. Res. Bus.Vol.4, No. 15, pp.835–859.

Kamunyu, C. W., & Theuri, F. S. (2017). "Factors Affecting Growth of Women Owned Small and Medium Enterprises in Kenya : A Survey of Women-Led SMEs in South Coast Ukunda". IOSR Journal of Business and Management, Vol.19, No.3, pp.60–66

Kishwar, M.S., M. Oliujjaman, M.A. Rahman and R. Akther.(2018), "Rural women and food security in Mymensingh district ", J. Bangladesh Agril. Univ. Vol.12, No.1, pp.105–110

Madiha Naz , Izhar Ahmad Khan , Ashfaq Ahmad Maan and Babar Shahbaz, (2020),"Women's contribution in provision of household food security: A study from rural areas of Punjab, Pakistan." Vol 45, No.1, pp.196-200

Minot, N., Epprecht, M., Anh, T. and Trung, L. (2006)"Income diversification in the upland of Vietnan". International Food Policy Research Institute, Washington D.C.

Mutangadura, G. B. (2005). "Gender, HIV/AIDS and Rural Livelihoods in Southern Africa:

Olabisi Alaba Fawehinmi & Olawamiwa Reuben Adeniyi. (2014), "Gender dimensions of food security status of households in Oyo State, Nigeria". Global Journal of human social science, Vol.14, No.1, pp.7-16 .

Onyebu, C. M. (2016), "Assessment of Income Generating Activities among Rural Women in

Enugu State, Nigeria", European Journal of Business, Economics and Accountancy, Vol. 4, No. 8, pp. 74-81.

Onyebu, C. M. (2016), "Assessment of Income Generating Activities among Rural Women in Enugu State, Nigeria", European Journal of Business, Economics and Accountancy, Vol. 4, No. 8, pp 74-81

Rajesh Paul, Bobita Mohajan, Mohammed Mahin Uddin and Md. Amjad Hossain Reyad, (2019), "Factors Affecting Women Participation in Local Government Institution: A Case Study of Bangladesh Perspective", Journal of Global Research in Education and Social Science, Vol.13, No.3, pp. 94-105

Salma Jabeen , Sanam Haq , Arif Jameel , Abid Hussain , Muhammad Asif , Jinsoo Hwang , and Abida Jabeen,(2020), "Impacts of Rural Women's Traditional Economic Activities on Household Economy: Changing Economic Contributions through Empowered Women in Rural Pakistan" Sustainability, Vol.12, No.2731, pp. 2-23

Yamane, Taro, (1967), Statistics, an Introductory Analysis, 2nd Ed., New York: Harper and Row.

Yusuf, H. A., Nuhu1, K. J., Shuaibu1, H., Yusuf, H. O. and Yusuf, O. (2015), "Factors Affecting the Involvement of Women in Income Generating Activities in Sabon-Gari Local Government Area of Kaduna State, Nigeria", American Journal of Experimental Agriculture,Vol.5, No 1, pp 54-59.