

Research Article

# Women and Agricultural Entrepreneurship in Rural Areas in West Africa: Case of Benin

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## Abstract

This research identified factors that can influence the forms of women's entrepreneurship in rural areas in Benin. The Harmonized Survey on Living Conditions of Households database carried out in 2018 was used for the study. Data in several countries (Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal, Togo) and financed by the World Bank. The annual survey to monitor the living conditions of households is part of the perspective of a better knowledge of poverty in WAEMU member countries, in order to understand its manifestations. This Data were submitted to a multinomial logistic regression model and, rural women in agricultural entrepreneurship were categorized into three groups based on sources of funding: entrepreneurship with access to credit (1.70%), entrepreneurship in association (17.88%), and entrepreneurship with equity (80.42%). The regression model identified factors such as socio-cultural affiliation, religion, geographical location, age, marital status, and the mother's branch of activity as social factors that determine the choice of forms of entrepreneurship. In addition to these factors, the study identified some constraints on women's agricultural entrepreneurship such as lack of employment, lack of access to land, level of education, access to water and grazing sites, floods/droughts, poor management, and poor sales of agricultural products as exogenous factors. Improvement of these factors could promote women's agricultural entrepreneurship in rural areas.

## Keywords

Women, Agricultural Entrepreneurship, Benin, Rural Environment

## 1. Introduction

Although men are more likely than women to become entrepreneurs, the proportion of women entrepreneurs is increasing globally [1]. For example, in 2016, Indonesia, Brazil, and Malaysia had very high rates of female entrepreneurship [1], and several economies also have female entrepreneurial

activity at the start-up stage equivalent to men's [2]. In the United States, women make up 40% of new entrepreneurs [3], yet the majority of women worldwide still face significant barriers to entrepreneurship [4]. Women make up 49.6% of the global workforce (UN, 2021), but they lack the economic

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mobility and decision-making power of men. The gender gap in access to essential resources is a major obstacle, but closing this gap by 25% by 2025 could lead to a US\$5.8 trillion increase in global gross domestic product (GDP) [5]. These results suggest the benefits of increasing the number of women entrepreneurs, but the influence of the gender gap remains uncertain and, therefore, requires sustained research attention.

According to Ndiweni and Verhoev [6], an approach to entrepreneurship argues that social experiences and situational conditions explain the origin and success of entrepreneurs. Within this school of thought, others such as Dana and Åge Riseth (2011) [7, 8] postulate that entrepreneurship is associated with a lower status, as is the case for rural women in developing countries. As a result, they are mostly marginalized.

This context is well linked to the nature of women's entrepreneurship in Benin, which operates mainly at the micro-enterprise level. Thus, most women in Benin see entrepreneurship only as a means of survival without growth potential. This perception is reinforced by the fact that they operate mainly in the agricultural sector. Indeed, in Benin, agriculture holds a prominent place in economic activity, occupying 70 to 80% of the workforce for a contribution of 27.1% to the GDP, according to World Bank statistics [8]. It is through the agricultural sector that rural women earn their income to meet personal needs, as well as those of children and relatives [9]. Depending on living conditions and socio-economic characteristics, they are engaged in different forms of entrepreneurship to increase their autonomy. The development of their activity is directly linked to their ability to generate income through various agricultural activities. As Singh (2009) has shown, small-scale entrepreneurship is the only solution to the problems of poor people's living conditions [10]. Entrepreneurship is a dynamic process of additional wealth creation by individuals who take major risks in terms of equity, time, and career commitment to bring value to certain products or services. The product or service itself may or may not be new or unique, but the value must somehow be infused by the entrepreneur by obtaining and allocating the necessary skills and resources. Thus, it is clear that in rural areas, the majority of women go into entrepreneurship but without significant support to lead them to success.

Indeed, the participation of rural women in agro-industrial activities goes far beyond what the statistics reveal. This is mainly because most of the work done by women on farms is disguised as daily household chores. The latest population and housing census confirmed once again the numerical superiority of women in Benin (51.48%) (RGPH4, 2015). As a result, they represent a large reserve of labor often underused and little valued. In rural areas, they constitute an important link in the Beninese economy. Women are effective entrepreneurs in enterprises focused on the production, processing, preservation, and marketing of agricultural products. The development of entrepreneurship among rural women con-

tributes not only to strengthen their personal capacities but also to increasing their decision-making status within the family and society as a whole.

Despite the renewed interest in research for a better understanding of female entrepreneurship [11], the different forms of entrepreneurship in which women invest are poorly documented. Knowledge of these forms can help strengthen the role of women in entrepreneurship. Thus, this study focused on the different forms of agricultural entrepreneurship led by rural women. Morris et al., (2018) suggest that entrepreneurship can play a significant role in reducing poverty levels. Given that poverty rates are highest in rural areas, it would be important to study the different forms of entrepreneurship in which women are involved to get themselves out of this situation. Despite the significant obstacles encountered, women in these environments can launch an impressive number of businesses [13]. Most are simple businesses with modest survival lifestyles [14]. Yet they support their families through these businesses. The challenge is to make entrepreneurship a more viable option for the poor and especially for women for their greater empowerment. The objective of this study is to characterize the different forms of agricultural entrepreneurship by women in rural areas and to determine the factors that can influence the choice of these forms of entrepreneurship. Therefore, the analysis of the different forms of entrepreneurship carried out by rural women will allow the different development actors to know the most dominant and economically profitable form. They will thus be able to concentrate their efforts on promoting it.

## 2. Literature Review

Entrepreneurship in general is considered a source of income like any job. When we talk about the field of entrepreneurship, the expression "business creation" follows instantly, as if this way of becoming an entrepreneur had no alternative" [15]. For [16], an individual goes into entrepreneurship in order to have a certain freedom and autonomy in relation to an existing status. Likewise [17, 18] argues that an individual turns to entrepreneurship not only for his autonomy but also for the sake of emancipation by freeing himself from the power of others and, by freeing himself from the existing social order, which is intrinsically linked to the rupture of the status quo. Thus, the purpose of entrepreneurship is aligned in advance in the search for change. However, women in rural areas are turning to entrepreneurship in order to get out of a situation. To get out of it, they choose a form of entrepreneurship depending on the conditions they face or the means at their disposal.

Investing in women can be seen as a "smart measure" that enables developing countries to break the cycle of poverty [19]. It's a win-win situation that benefits not only women, but society at large [20]. Income-generating activities do not only empower an individual; but also benefits the whole family. According to [21], women are more likely than men to spend their income on the well-being of their families. They spend

their income on nutritious food, school fees and health care for their children [21]. Investing in gender equality and women's economic empowerment results in the creation of more jobs and decent work for women, which promotes sustainable growth and development [22]. In addition, "investing in women pays a significant dividend for women" [22]. Despite all these benefits, progress in promoting gender equality and women's economic empowerment is hampered by various constraints [21]. To reduce this gender inequality, women must be provided with decent employment opportunities in the labor market [23], prove to women that they have equal opportunities to own strategic productive resources such as land [24]; improving women's access to information (e.g. through access to technology) example [25] and encouraging women's entrepreneurship through the provision of finance, training and an enabling environment for women entrepreneurs to thrive. Women's agricultural entrepreneurship is an avenue that can be used to economically empower rural women [26]. Women's entrepreneurship is at the heart of the economy, the development of any nation [27] and; It qualifies as a key topic in contemporary global political discourse [28]. Since women's entrepreneurship is a huge contributor to economic development [27], a research study in this area would be a key component of research for economic development. In fact, research on economic growth is incomplete without acknowledging the contribution of women's entrepreneurship [29] because they represent a vast pool of untapped entrepreneurial talent [31, 32] that all nations could use to develop their economies [31]. In fact, several studies claim that family responsibilities are discriminated against and act as potentially limiting factors for women entrepreneurs [32]. This can hinder the development of their young companies. Some researchers such as [35, 36] consider the growth of women's entrepreneurship to be the biggest, yet quietest revolution of all time. This study aims to analyze the different types of entrepreneurship that could be observed in the environment and the factors that can influence these forms of entrepreneurship led by women in rural areas of Benin.

### 3. Methodology

#### 3.1. Data Used

This study used the Harmonized Survey on Household Living Conditions database (EHCVM) to extract data collected in 2018 in several countries (Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal, Togo) and financially supported by the World Bank. The annual survey for monitoring household living conditions is part of the prospect of a better understanding of poverty in West African Economic and Monetary Union (WAEMU) member countries, in particular, to understand its manifestations. It aims to provide useful data for refining the analysis within the various sectoral and thematic groups of the institutional mechanism for monitoring the implementation of the Poverty Reduction

Strategy Paper (PRSP). Data available in the Benin EHCVM database are essentially primary data and collected by face-to-face questionnaires administered directly to household members. We extracted a total of 9322 women agricultural entrepreneurs. The statistical unit here is "woman creator of agricultural business". This included women entrepreneurs involved in the chain such as traders, resellers of agricultural products, and artisans. Some respondents from the database were excluded to make the group of entrepreneurs homogeneous and to have a solid basis of comparative elements. Data used are related to the different women's activities such as agriculture, livestock and fishing, their socio-demographic characteristics, and well-being conditions, including some empowerment aspects.

#### 3.2. Data Analysis

The most widely used methods to characterize farm systems are various multiple analyses relating to data analysis approaches that successively associate principal component analysis (PCA), hierarchical ascending classification (CAH), discriminant factor analysis (AFD), and multiple correspondence factor analysis (AFCM) (Coulbaly, 2012). However, this research opted for a classification that would identify the links between women's characteristics and the forms of entrepreneurship they do.

We classified women's entrepreneurship based on the literature and the kind of resource used by actresses for their activities. In addition, other conditions were used to differentiate and highlight the forms of agricultural entrepreneurship. So, a woman who has a job in agriculture and is self-employed is considered as an agricultural entrepreneur. If she applied and obtained a loan from a microfinance company and uses it to purchase equipment or any other input into agricultural production, she is classified in the group of women doing agricultural entrepreneurship with access to credit. A woman who is involved in an association (self-help or production group) is classified in the group of women doing agricultural entrepreneurship in association. Women who do not belong to any of these three groups are classified in equity entrepreneurship. We excluded all data related to women living in an urban environment because the research focus is on the rural environment. Only women over 18 years old were included in this research because in Benin legislation an individual under 18 years old is considered as a minor.

First, the data were analyzed statistically to identify the different forms of entrepreneurship. Logistic regression was then applied to identify the determinants of women's choice for different forms of agricultural entrepreneurship in rural areas.

#### 3.3. Econometric and Empirical Model

Logistic regression analysis allows one to predict a discrete outcome such as group membership from a set of variables

that may be continuous, dichotomous, or a mix. This technique is used when we want to verify if many independent variables can predict a dependent dichotomous variable. Unlike multiple regression and discriminant function analysis, the logistic regression does not require a normal distribution of predictors neither equal variance within each group (homogeneity of variances). Different types of logistic regression exist, each one having a statistic procedure and will conduct the elaboration of different theoretical models. We used multinomial logistic regression in Stata software to identify the determinants of the choice of forms of agricultural entrepreneurship.

A woman's decision to start a business in a rural area is considered to be a choice between entrepreneurship with access to credit (A), equity (B), or entrepreneurship in a cooperative or group (C). Choice models in consumer theory provide guidance for such decision models [34]. Women make a choice of the form of entrepreneurship based on the maximum benefits or utility (income) expected from this activity. Given the three alternatives A, B, and C and assuming that there are no links between the forms of entrepreneurship, a rational individual would choose alternative A if the utility  $U_A > U_B$  and  $U_A > U_C$ , etc.

Woman "i" is expected to maximize the subordinate utility (U) of the good got from entrepreneurship "j", subject to budget constraints and production function [37, 38]. Following [36], we express the utility maximization equation as follows:

$$\text{Max}\{E(U = f(X_i) + \varepsilon_i); 1, \dots, n \quad (1)$$

Where  $U$  is the expected or perceived utility of the female entrepreneur, and  $f(X)$  is a function of  $X_i = x_{i1}, \dots, x_{ik}$ ; ( $1 \times k$ ) vector of observable characteristics or factors specific to the  $i^{\text{th}}$  woman entrepreneur, her farm, and her agricultural business. The random term  $\varepsilon_i$  represents the error term and is a measure of expected utility; unobserved characteristics, attributes, and preferences; and instrumental variables [36, 37].

The improvement of an individual's living conditions ( $Q_i$ ) is a function of a vector of individual characteristics ( $Z$ ) and characteristics that are external ( $X$ ) [38]. It follows that individual  $i$  will maximize the unconditional utility function ( $U^*$ ), which is given by the following equation:

$$U_j^* = \max(U_{i1}; U_{i2}; \dots U_{ij} + 1) \quad (2)$$

Where  $U_{ij}$  is the utility function  $j = 1, 2, 3$ .

Equation (2) provides an alternative solution to choose the form of entrepreneurship that produces the greatest utility and must be chosen by an individual [38].

By integrating  $m_i = P_{ij} + Pc_{ij}$  into Eq. (1), we obtain a conditional utility function for  $j$ , which can be written as follows:

$$U_{ij} = U(H_0 + Q_{ij}(X, Z); m_i - P_{ij}) + e_{ij} \quad (3)$$

When the above utility function is quasi-linear in  $H_{ij}$  and  $C_{ij}$  and these components are greater than zero, \_\_\_\_\_ of the indirect utility function is given by

$$V = V(P, H, Q(X, Z), m) + e \quad (4)$$

Equation (4) is the reduced form of indirect utility as a function of the alternative  $j$ . In most of the literature, it forms the basis for estimating demand functions. It conveys the message that demand depends on price, condition, improvement, individual characteristics, and suppliers [39]:

The indirect utility obtained by a woman from a data, according to [40], can be derived from a specific multiplicative of indirect utility as follows:

$$\ln V = V^* + e_{ij} \quad (5)$$

$V$  denotes the indirect utility gained by individual  $I_j$ ,  $i$  ( $I = 1, 2, \dots$ ) from the choice of the form of entrepreneurship  $j$  ( $j = 1, 2, 3$ ), and  $e$  is the term for the random error. In addition,  $V$  can be decomposed as follows:

$$V_{ij} = X_{ij}\beta + Z_i\alpha_i \quad (6)$$

Where:

$X$  ( $= \ln X_1, \ln X_2, \dots, \ln X_k$ ), les  $X_k(k) \in \{1, 2, 3\}$  are specific to an alternative (type of supplier) observable exogenous variables;  $B$  is a vector  $K \times 1$  of unknown parameters to be estimated;  $Z_i = (\ln Z_{i1}, \ln Z_{i2}, \dots, \ln Z_{iG})$ , les  $Z_{iG}$  ( $g = 1, 2, \dots, G$ ) are exogenous characteristics specific to the individual (patient) variables; and  $\alpha$  is a  $G \times 1$  vector for the unknown parameters to be estimated [41].

Assuming [something is] independently identically distributed,  $e_{ij}$  is the log-Weibull distribution for disturbances, and  $P_{ij}$  is the probability that individual  $I$  will choose the form of entrepreneurship  $J$ :

$$P_i = \frac{\exp(V_{ij})}{\sum_{j=1}^J \exp(V_{ij})} \quad (7)$$

By substituting Eq. (6) into Eq. (7), the probability that individual  $i$  will choose the form of entrepreneurship  $j$  is rewritten as follows:

$$P_i = \frac{\exp(X_{ij}\beta + Z_{jai}\alpha_i)}{\sum_{j=1}^J \exp(X_{ij}\beta + Z_{jai}\alpha_i)} \quad (8)$$

Assuming that  $Y_i$  is a random variable indicating the choice made, the probability of choosing provider  $j$ , according to [40] is as follows:

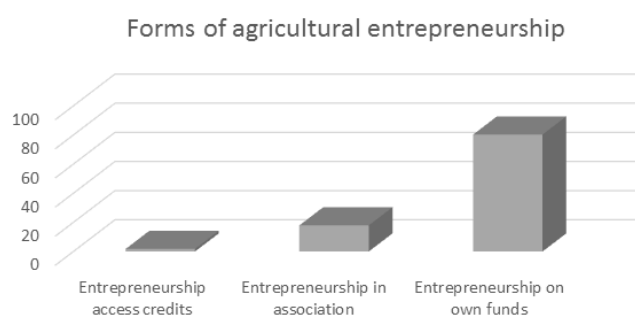
$$P_i = \text{prob}(Y_i = j) = \frac{\exp(X_{ij}\beta + Z_{jai}\alpha_i)}{1 + \sum_{j=1}^J \exp(X_{ij}\beta + Z_{jai}\alpha_i)} \quad (9)$$

Moreover, the probability of this choice is  $\ln L_i = D_{ij} \ln p_r(Y_i=j)$ , where  $D_{ij}$  is a dichotomous variable that takes the

value 1 if individual  $i$  chooses the alternative  $j$  (i.e., if  $Y_i = j$ ) and 0 if she does not [40].

## 4. Results

### 4.1. Different Forms of Women's Entrepreneurship



**Figure 1.** Distribution of women entrepreneurs by the form of entrepreneurship.

Three categories of entrepreneurship were identified based on the financing forms used by women doing their business.

There is entrepreneurship with access to credit, entrepreneurship funded using own their own equity, and entrepreneurship in cooperatives or groups. Thus, most rural women prefer equity entrepreneurship. Indeed, the results indicate that 1.70% of women entrepreneurs in rural areas do entrepreneurship with access to credit, 17.88% do so in association, and 80.26% using their own funds (Figure 1).

### 4.2. Determinants of the Choice of Forms of Agricultural Entrepreneurship

The estimated model was globally significant at the 1% level (Table 1). About 38.6% of the variation in the factors determining women's choice of different forms of agricultural entrepreneurship was explained by the explanatory variables introduced in the model. Factors such as household size, age, income, mother's branch of activity, the various constraints or difficulties faced by women, level of education, marital status, religion, and geographical location significantly determined women's choice of one or other of the three forms of entrepreneurship (Table 1). The specific influence (sign and marginal effects) of these variables varied according to each form of entrepreneurship. The determinants of the choice of these three forms of women's agricultural entrepreneurship can be classified into two categories: social determinants and determinants related to the constraints faced by women.

**Table 1.** Estimation using the multinomial logitics model of determinants for the forms of agricultural entrepreneurship.

Variables	Determinants of forms of agricultural entrepreneurship		
	Entrepreneurship with access to credit	Entrepreneurship in association	Own-income Entrepreneurship
Household size	0.003 ***	-0,034***	0,030***
Age	0.0007 ***	-0,004***	0,003***
Mother's industry	0.002 ***	-0,002	-0,0008
<i>Constraints</i>			
Lack of employment	-0.0173 ***	0,080***	-0,063***
Lack of education	-0.0258 ***	-0,054***	0,080***
Lack of land	0,016 ***	0,078***	-0,095***
Lack of water	-0,127	0,198	-0,070
Drought-flood	0,020***	-0,180***	0,162***
Mismanagement	0,005**	0,071***	-0,077***
Level of education completed (No level of education)			
Primary	0,005	0,061 ***	-0,067***
Secondary G1 1	0,015	0,008	-0,006
Secondary technique 1	-0,013	0,757	-0,744
Secondary G1 2	0,192***	-0,143***	-0,049**



Variables	Determinants of forms of agricultural entrepreneurship		
	Entrepreneurship with access to credit	Entrepreneurship in association	Own-income Entrepreneurship
Postsecondary	-0,013***	-0,199***	0,217***
Superior	-0,013	-0,193***	0,206***
<i>Marital status (ref: Single)</i>			
Monogamous married	-0,021**	-0,047***	0,068***
Polygamously married	-0,010	0,070***	-0,081***
Cohabitation	-0,038***	-0,213***	0,252***
Widower	-0,038***	-0,027	0,065***
Divorced	-0,012	-0,031	0,044*
<i>Ethnic group (ref: Adja)</i>			
Fon and related	0,023	0,139	-0,162
Dendi and related	-0,239	-0,134	0,373
Bariba and related	-0,216	0,111	0,105
Ditamari and related	-0,239	-0,040	0,280
Yoruba and related	-0,227	-0,100	0,328
Yom lokpa and related	-0,239	-0,115	0,354
Peuhl and related	-0,239	-0,134	0,373
Naturalized and other	-0,239	0,311	-0,071
<i>Location (ref: Atlantic-Littoral)</i>			
Borgou-Alibori	0,291	-0,053	-0,238
Atacora-Donga	0,277	-0,043	-0,234
Zou-Collines	-0,035***	-0,102***	0,137***
Mono-Couffo	-0,034***	0,056***	-0,021
Ou é Plateau	-0,019***	0,087***	-0,067***
<i>Religion (ref: Muslim)</i>			
Christian	-0,059	0,193	-0,133
Animist	-0,029	0,147***	-0,117***
Other religion	-0,070***	-0,061	0,132
No religion	-0,070***	-0,061	0,132
Number of observations	9322		
Khi <sup>2</sup>	0,0000		
R <sup>2</sup> (%)	38,60		

\*\*\*, \*\*, \*: significant, respectively, at the 1%, 5%, or 10% threshold

#### Household Size

Household size had a significant effect on the choice of the form of entrepreneurship ( $p < 0.01$ ; Table 1). This suggests that family support has a positive effect on the form of en-

trepreneurship that women undertake. Indeed, agriculture requires a lot of labor, especially during high-production activities periods. However, women do not have enough resources to cope with the burdens associated with all agri-

cultural activities. Farmers need an abundant workforce for various production operations. For example, land clearing, plowing, weeding, sowing, and harvesting require the most labor. Labor is also needed in livestock for binging animals to pasture. For agricultural processing, the use of a large amount of labor is not necessary; moreover, a woman processor takes care of her activity alone in most cases and is helped incidentally by her children. The use of family labor for production can also be considered as a long-term strategy because some producers have many wives and children in order to have a sufficient workforce in the future. Thus, the larger the size of the household, the more it would help woman in her various activities. This explains why we observe the positive effects at the level of entrepreneurship with access to credit and entrepreneurship funded using their own equity.

#### *Age*

Age had a negative effect on the choice of entrepreneurship in association, and a positive effect on the other forms ( $p < 0.01$ ; Table 1). Thus, age increased the probability for women in rural areas to be engaged in entrepreneurship with access to credit and equity by 0.07% and 0.3%, respectively. However, the positive effect of entrepreneurship with access to credit would be linked to the microfinance institutions, which have more confidence in the elderly because it is assumed that they have much more experience in agricultural entrepreneurship. The probability for older women to do entrepreneurship in association decreased by 0.004. Thus, women at a certain age prefer to work alone rather than be in partnership.

#### *Constraints*

Irrespective of the form of entrepreneurship, women still faced constraints in entrepreneurship in rural Benin. Entrepreneurship with access to credit had constraints such as lack of access to land, problems of flooding and drought in both rainy and dry periods, and poor management within farms. Following the access to credit, these constraints had a positive effect on entrepreneurship (Table 1). Thus, women probably obtain credit to purchase the land or fund the development of the sites available for their production. However, the constraints linked with a lack of employment or a lack of education had a negative effect on entrepreneurship with access to credit. This could be because microfinance institutions prefer to grant credit to women who are more or less literate and have an income-generating activity. These factors could be part of the conditions for access to agricultural credit.

In addition, women entrepreneurs in associations also faced several constraints such as lack of employment, lack of education, lack of access to land, problems of floods and droughts, and poor management of their farms. These constraints influenced both positively and negatively the choice of entrepreneurship in association. Thus, due to the lack of education, the association could lose opportunities to collect information, and negotiation could be reduced during the sale of agricultural products due to the lack of information on market regulation.

Women entrepreneurs with their own equity also faced the

same problems such as the lack of employment or land for production and poor management, which had a negative effect on equity entrepreneurship. In contrast, the lack of education and presence of drought had a positive and significant effect ( $p < 0.01$ ). In the study area, women had limited access to land, which is a real problem because land is the primary factor of production. And without education, they usually find the difficulty to manage their business properly. However, poor management within households is sometimes due to the low level of processing and preservation of agricultural products. This obliges women to sell their products at low prices. This can result in debt for women entrepreneurs who can no longer meet their financial commitments to microfinance institutions, causing the non-emergence of agricultural businesses managed by women.

#### *Level of Education*

Women with primary education tended to pursue entrepreneurship in association and using their own funds (Table 1). Primary education negatively affected the choice of entrepreneurship using their own equity. Nevertheless, secondary education levels (G1 and tech 1) had no effect on the choice of forms of entrepreneurship. This could be partly explained by the fact that women are unlikely to attend these types of training courses, and those who do prefer to work in other fields rather than agriculture. However, those with secondary (G2) and post-secondary education tend to go towards all three forms of agricultural entrepreneurship.

#### *Marital Status*

Women's marital status was also one of the factors determining the choice of forms of agricultural entrepreneurship in Benin. Compared to singles, being married significantly improved a woman's choice to undertake entrepreneurship. Thus, the probability of a married woman in a monogamous regime facing entrepreneurship with access to credit or equity decreased by 2.1% and 4.7%, respectively. However, for monogamous married women doing entrepreneurship on equity, the probability increased by 6.8%. The results also revealed that women married in a polygamous regime were moving towards entrepreneurship in association and using their own funds. The likelihood of a woman engaging in partnership entrepreneurship increased by 7% when she was married and in a polygamous regime. However, it decreased when women engaged in equity entrepreneurship. For women in common-law or widowed unions, the chance of them choosing to undertake and access credit decreased by 3.8%. In the same way, this chance decreased by 21.3% for women in a common-law union and entrepreneurship in association. Nevertheless, this chance increases by 25.2% and 6.5% respectively when she is a self-employed entrepreneur and is in a common-law or divorced relationship. These results show that women do not have easy access to credit, and this could be explained by the fact that in rural areas they generally do not have the means to guarantee their loans from microfinance institutions.

#### *Geographical Location*

In reference to the area with the highest urbanization (Atlantic-Littoral), the majority of women agricultural entrepreneurs did not go to credit. However, in localities with high agricultural production (Atacora-Donga and Borgou-Alibori), no significant effect was observed on the different forms of entrepreneurship. In other regions, there was a significant effect ( $p < 0.01$ ) at the level of entrepreneurship with access to credit. This could be explained by the fact that women are unable to obtain credit from microfinance institutions due to a lack of collateral. Any microfinance institution requires a guarantee with the granting of any credit. Generally, this guarantee is much more earth-related. Indeed, in these rural areas, land is given only to men. Similarly, these institutions are wary because agriculture is a risky business. As a result, women are inclined towards other forms of entrepreneurship. With regard to the form of entrepreneurship in association, there was a significant effect ( $p < 0.01$ ) in the departments of Mono-Couffo, Donga, Mono, and Ouémé-Plateau. Thus, the probability of women being in association entrepreneurship in these areas increased by 5.6% in Mono-Couffo and 8.7% in Ouémé-Plateau. Also, in the center of the country, we observed a negative and significant effect ( $p < 0.01$ ). In addition, women were less likely to engage in association entrepreneurship when they were in the center of the country (Zou-Collines). However, the probability of entrepreneurship using their own funds increased by 13.7%. Finally, belonging to the department of Ouémé-Plateau decreased the probability of women doing agricultural entrepreneurship using their own funds by 6.7%.

#### Religion

With the Muslim religion as a reference, we notice that animist women were more likely to go towards entrepreneurship in association and using their own funds. The probability of being animist and doing entrepreneurship in association increased by 14.7%, but it decreased by 11.7% for women doing entrepreneurship using their own funds.

### 4.3. Income and Entrepreneurship Forms

Women in entrepreneurship with access to credit had a higher income than those in partnership or using their own equity (Table 2). This could be explained by the fact that women with access to finance are able to complete activities on time, which guarantees them a better return. In addition, agricultural activities require economic support and a focus on education and training, which are available to women with access to credit.

Indeed, most microfinance institutions follow the beneficiaries of loans in order to be reassured that customers will be able to meet repayment deadlines and maintain solvency. As a result, these institutions provide training to the latter so that they can properly manage the credit granted to them. These are opportunities that other women entrepreneurs with equity and association do not have.

Similarly, women in partnership entrepreneurship have a

higher income than women in equity entrepreneurship. Because farms are generally located in rural areas where activities are less diversified, farmers have less opportunity to belong to a network for the prosperity of their business, especially women farmers. Being in an association is, therefore, an advantage and may explain why the income of women entering partnership entrepreneurship is higher than those who engage in entrepreneurship by themselves.

**Table 2.** Comparison of income by the form of entrepreneurship.

Form of entrepreneurship	Average (FCFA)	Frequencies
Entrepreneurship with access to credit	1 959 658 (846 727.45)	(1.70%)
Entrepreneurship in association	1 254 431 (995 615.53)	(17.88%)
Entrepreneurship using own funds	1 173 017 (781 894.49)	(80.42%)
F=128.31 P= 0.0000		

1 US\$ = 600 FCFA (these amounts are in FCFA)

## 5. Discussion

This study analyzed the factors determining the entrepreneurship forms chosen by women in rural areas. At the social level, it appears that the lack of education of rural women, their age, tradition, marital status, and their mother's branch of activity influence female agricultural entrepreneurship. These results partly corroborate those of [42], who found that women are more likely to be entrepreneurs when they are married in monogamous regimes, uneducated (in rural areas), or when their parents, especially their father, did not have a formal education. According to this author, female entrepreneurship is also influenced by the environment of residence. This confirms our results, which showed that the environment of residence of women agricultural entrepreneurs determined the form of entrepreneurship they do. Indeed, it was shown in this study that entrepreneurship with credit was done much more in areas with high agricultural production (i.e., the northern zone of the country where agricultural production is much more concentrated). The other two forms of entrepreneurship were more common in areas with average or low production.

Several constraints hindered the development of different forms of entrepreneurship. [43] found in their work on factors and constraints of agricultural entrepreneurship that agriculture faced enormous difficulties at a natural, human, and organizational level. The most important of these were flooding, access to cultivable land, labor, financing for agricultural activities, transportation routes for products, and the market. Given that agriculture in general faces these problems,



it is foreseeable that this will be reinforced at the women level because they are mostly marginalized. Thus, the results show that women's agricultural enterprises were confronted with some of these difficulties: lack of access to land, lack of water for animal grazing, problems related to floods and drought, poor management of agricultural enterprises, and poor sales of agricultural products. These constraints represent enormous challenges that women face in the exercise of their various agricultural activities. Moreover, in Benin, although agriculture is the largest contributor to the economy, it is not sufficiently valued. Investing in agriculture is still perceived as a second-rate activity reserved for uneducated people.

There was a high rate of women in association or individual entrepreneurship on equity. However, 1.70% of them were entrepreneurs with access to credit, 17.88% in associations, and 80.26% with their own funds in rural Benin. Thus, the low rate of women in entrepreneurship with access to credit highlights the difficulty of contracting credit in MFIs given their requirements. This explains the high rate of women going into entrepreneurship using their own funds. These results corroborate those of [44], who found that individual businesses and groups are favored by women who for the most part have low social capital and turnover. Indeed, his results show that children, especially girls, are involved as labor in crafts and trade, the main sectors in which Beninese women undertake their business. From an early age, they are integrated into the traditional system of learning entrepreneurship in order to acquire the necessary know-how [42]. These results could explain those obtained in the present study showing that girls go into agricultural entrepreneurship when they have their mother as an agricultural entrepreneur. In the same vein, [45] found that knowing other entrepreneurs has a significant and positive influence on the propensity to become an entrepreneur. Thus, having a parent who is an agricultural entrepreneur could impact the daughter to have agricultural entrepreneurship as an activity. This result corroborates those of [46, 47, 48-50]. Similarly, [47] shows that education also has a significant influence on the entrepreneurial propensity of individuals attempting to start a new business in the agricultural sector, but this relationship is only significant for individuals with a degree. This result contrasts with the findings of [48], who examined the same relationship within European agricultural entrepreneurship and found that education reduces the probability of starting a business in the agricultural sector. As was the case in this study, most women going to agricultural entrepreneurship have a lower level of education, and those with high education prefer to go into other types of activities. Thus, although agriculture is the largest contributor to the economy in Benin, it is not sufficiently valued. Investing in agriculture is still perceived as a second-rate activity reserved for uneducated people.

On the other hand, [49] have shown that households with fe-

male-run enterprises are more food secure in Niger than households with male-run enterprises. Those who go into entrepreneurship with access to credit have higher incomes than women doing entrepreneurship on their own or in associations because agricultural enterprises require enough economic support [50]. Women without sufficient resources are obliged to use micro-finance services. They join together in tontines to have sufficient capital to rent large areas of land for cropping. These modes of organization and strategies used in practice are part of the logic of circumventing and avoiding the weight of tradition in order to acquire agricultural autonomy [51].

## 6. Conclusion

This study estimated the determinants of the different forms of agricultural entrepreneurship by women in Benin. Several factors determined the forms of entrepreneurship, although there were no major differences between the determinants of the choice of different forms of entrepreneurship. These included ethnic group, religion, geographic location, age, marital status, and the mother's industry, among other social factors. Apart from these factors, we also observed some constraints that hindered the development of these enterprises. Indeed, constraints related to lack of employment, lack of land, lack of education, lack of water and sites for grazing, flooding/drought, poor management, and poor sales of agricultural products were exogenous factors that, if improved, could promote female agricultural entrepreneurship in rural areas. The findings have various implications for policymakers to promote rural women's agricultural enterprises. Understanding these different factors underlying women's agricultural entrepreneurship will allow a better understanding of public policies for poverty alleviation to ensure that these enterprises are more effective and lead to the empowerment of these women within households. It would therefore be interesting to carry out an in-depth analysis in order to emerge for the next steps on the effect of these forms of entrepreneurship on the various decisions made by women.

## Abbreviations

EHCVM	Harmonized Survey on Household Living Conditions
ILO	International Labour Office (ILO)

## Conflicts of Interest

The authors declare no conflicts of interests.

## Appendix

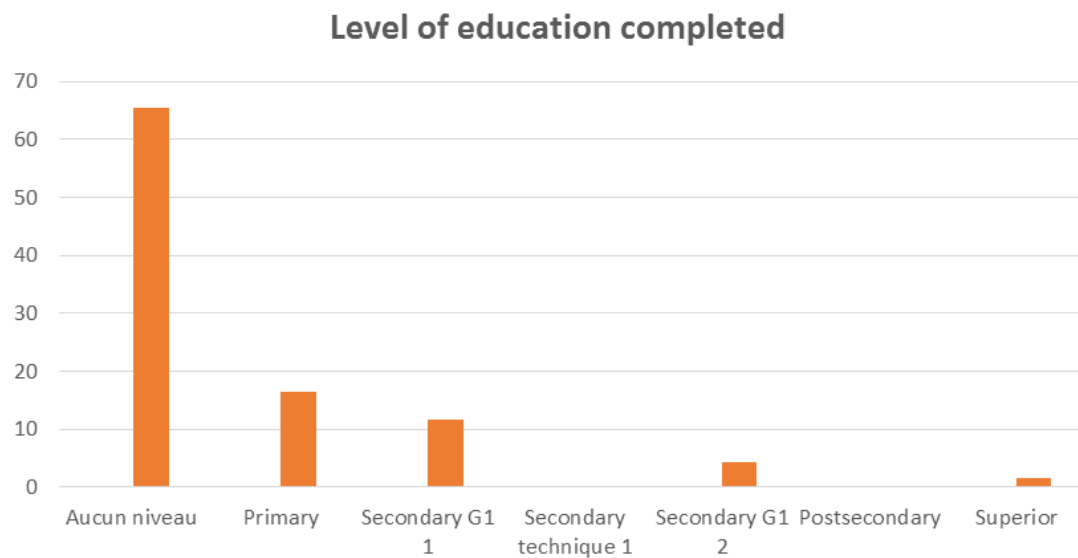
**Table 3.** Descriptive Statistics.

Variables	Minimum	Maximum	Mean	Standard deviation
Age (years)	18	70	36,11	13,79
Household size	2	24	5,16	2,88

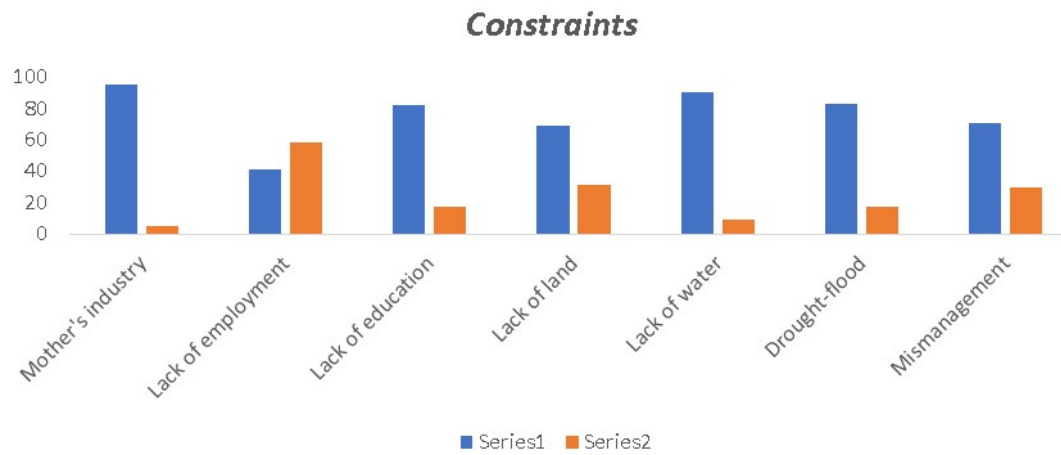
Source: EHCVM, 2018

	entrep-t	age	brnchm-i	hhsz	Mnq_empl	Mnq_in-u	Mnq_te-e	Mnq_eau	Sech_I-d	Mauv_g-t	educ_hi	sit_mat	group_-e	REGION
entrep_cre-t	1.0000													
age	0.0710	1.0000												
brnchmcre-i	-0.0084	-0.0154	1.0000											
hhsz	0.0443	-0.2400	0.0043	1.0000										
Mnq_empl	-0.2000	-0.1079	-0.0009	-0.0444	1.0000									
Mnq_instru	0.0448	-0.0249	0.0137	0.1124	-0.0854	1.0000								
Mnq_terre	0.0760	0.0197	0.0042	0.0772	-0.2739	-0.0722	1.0000							
Mnq_eau	-0.0114	-0.1155	-0.0045	0.1207	-0.1672	0.0447	-0.0103	1.0000						
Sech_Inond	0.1233	0.1428	-0.0072	-0.0319	-0.2692	-0.1756	0.1372	-0.0900	1.0000					
Mauv_gest	-0.1171	-0.0060	-0.0088	0.0147	0.0803	0.0506	-0.3377	-0.1268	-0.1910	1.0000				
educ_hi	-0.1122	-0.3432	0.0090	0.0842	0.2761	-0.0171	-0.0418	0.0401	-0.1284	0.0600	1.0000			
sit_mat	0.0640	0.5000	-0.0093	-0.2126	-0.1218	-0.0456	0.0381	-0.0718	0.1740	-0.0368	-0.3055	1.0000		
group_ethnie	0.2014	-0.1825	-0.0013	0.1573	-0.1492	-0.0600	0.0837	0.0626	-0.1150	-0.0295	-0.0780	-0.1314	1.0000	
REGION	-0.0287	0.1404	0.0038	-0.1532	0.0827	-0.2058	-0.0310	-0.0717	0.1784	-0.1479	0.0085	0.0824	-0.3457	1.0000
religion	-0.0410	0.3400	-0.0032	-0.2214	0.0930	-0.0124	0.0469	-0.0886	0.1352	-0.0261	0.0518	0.2180	-0.2979	0.2499
religion	1.0000													

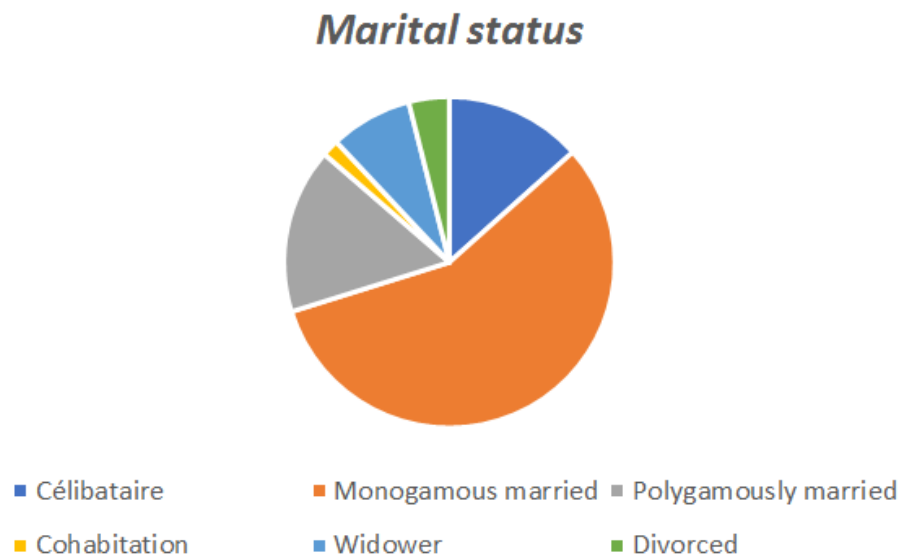
**Figure 2.** Correlation test.



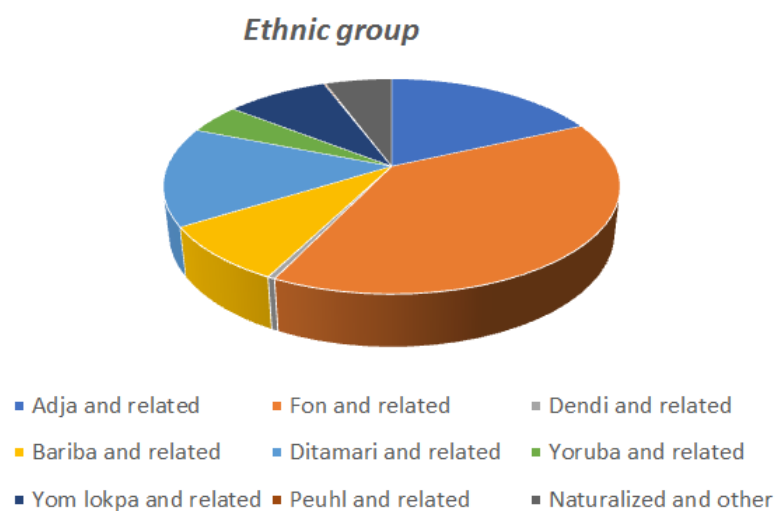
**Figure 3.** Level of education completed.



**Figure 4.** Mother's industry and Constraints Level of education completed.



**Figure 5.** Marital status.



**Figure 6.** Ethnic group.

## Location

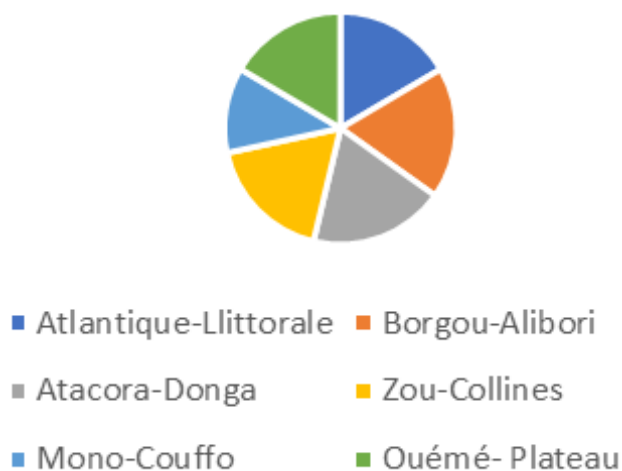


Figure 7. Location.

## Religion

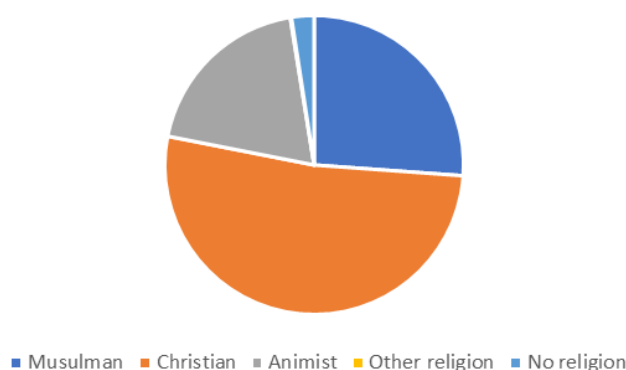


Figure 8. Religion.

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