

# Effect of access to arable land on women's empowerment in Burkina Faso: A double-censored regression approach

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## Abstract

*This paper analyses the effects of access to arable land on women's empowerment in Burkina Faso. It uses data from the harmonised survey on household living conditions (EHCVM 2021–2022). A women's empowerment in agriculture index was constructed as the dependent variable, and a double-censored regression method was employed for the analysis. Adopting the capabilities approach, this paper distinctly examines the role of access to arable land in the process of women's empowerment. The results show that women's access to arable land contributes to significantly increasing their empowerment and reducing gender inequalities in household decision-making. These findings call for targeted policy action, including inheritance law reform, to eliminate discriminatory practices against women, simplify land registration procedures to make them accessible to rural women, and provide support for women's cooperatives through the creation of local processing units. These aspects will enable women to fully capture the added value of their production.*

**Key words:** access to arable land, Burkina Faso, women's empowerment

## 1. Introduction

Women's economic empowerment has emerged today as a strategic pillar of inclusive development policies, sparking intense debate within international organisations and civil society. According to Moser (1989), empowerment is defined as the process through which women gain the ability to take control of their lives, develop critical consciousness, achieve independence and exert a decisive influence on the choices that affect them. Fundamentally, it translates into a greater capacity to make free and informed decisions in pursuit of goals they deem essential.

In developing countries, however, this drive for autonomy collides directly with the reality of rural economic structures, of which women nevertheless serve as the primary engine. Globally, women account for approximately 43% of the agricultural labour force (Morsy & Mukasa 2019). This phenomenon is particularly pronounced in Sub-Saharan Africa, where 66% of economically active women work in the agricultural sector, compared to 60% of men (UN Women 2024).

This central economic role nonetheless conceals a major structural paradox: while land remains the indispensable productive asset for income generation and food security in rural areas (Meinzen-Dick *et al.* 2019), women remain largely marginalised in terms of land rights ownership compared to men (Doss & Meinzen-Dick 2020). This exclusion is perpetuated by the coexistence of deficient legislative frameworks and restrictive customary practices that limit women's direct access to and effective control over land resources. Consequently, removing land-related barriers appears to be a critical imperative for breaking the vicious cycle of rural poverty (Agarwal 2018; Han *et al.* 2019).

This observation applies with particular acuity to Burkina Faso, a society marked by deeply entrenched patriarchal and gerontocratic structures. Although they account for nearly two-thirds of the national agricultural workforce (Nikiema & Kponou 2021), Burkinabè women face severe socio-cultural constraints that drastically impede their access to productive factors and decision-making bodies.

From a theoretical perspective, the conceptualisation of resource access revolves around two complementary approaches. De Janvry and Sadoulet (2001) view access to land through an institutional lens, defining it as the set of formally established rights that enable individuals to derive benefits from resources. However, the theory of access developed by Ribot and Peluso (2003) brings nuances to this strictly legalistic view. Indeed, these authors redefine access as the actual ability to benefit from resources. From this perspective, the mere possession of a formal right does not guarantee its effective exercise, as individuals' agency remains strongly conditioned by power relations, embeddedness in social networks and local political constraints. This approach aligns naturally with Sen's (1999) capabilities approach, according to which empowerment relies on the expansion of real freedoms and individual capabilities. It is precisely these capabilities that enable actors to negotiate their position, assert their influence and transform the institutional structures that disadvantage them to their benefit.

Empirically, an extensive body of literature confirms that secure access to arable land strengthens rural women's bargaining power, financial autonomy and intra-household decision-making authority (Adekunle *et al.* 2024; Hong *et al.* 2024; Sultana *et al.* 2024). Financial autonomy derived from direct land management improves women's social status and promotes a reallocation of resources towards family well-being.

However, contemporary academic debate reveals deep controversies regarding the actual modes of operationalising this empowerment. Several authors challenge the deterministic view that establishes a linear link between land access and the acquisition of genuine agency.

On the one hand, the granting of formal rights frequently encounters a lack of effective control and the persistent weight of male mediation. In this regard, Rao *et al.* (2025) demonstrate that these legal prerogatives remain inoperative if women remain excluded from input, capital and labour markets, while Dossou-Cadja (2020) highlights that dependence on a male intermediary fosters relational vulnerability and the recurring fear of eviction.

On the other hand, this dynamic sparks fierce patriarchal resistance and negative social reactions (backlash), with Lambrecht *et al.* (2023) warning against perverse effects such as an escalation in intra-family conflicts, the deterioration of marital relations, or even the forced re-appropriation of plots by men.

Finally, the positive impact of these measures is neutralised by the material marginality of the land allocated to women. Tavenner *et al.* (2019) observe that women often inherit plots with low fertility, far from water sources, or subject to precarious leases, thereby perpetuating a low-productivity trap and ultimately negating the expected gains in empowerment.

Despite the richness of these debates, the economic literature presents a major methodological and empirical gap. While the factors conditioning access to credit or technology are extensively documented, the specific direct effect of access to arable land on women's empowerment has not yet been modelled using a double-censored econometric approach. Yet this omission obscures the self-selection bias and double censoring that characterise the measurement of empowerment levels in rural settings.

This paper aims to address this gap by analysing the effect of access to arable land on women's empowerment in Burkina Faso. It hypothesises that secure access to arable land exerts a positive effect on women's empowerment by increasing their autonomous income and strengthening their financial and food security decision-making power within the household.

The significance of this research lies in its threefold contribution. Econometrically, this paper fills a methodological gap by employing a double-censored model that ensures estimates corrected for selection bias. In addition to this analytical rigor, there is the richness of the empowerment metric used (the Women's Empowerment in Agriculture Index [WEAI]). Moving beyond simplistic monetary indicators focused solely on income, this research assesses empowerment through the Women's Empowerment in Agriculture Index, developed by Alkire *et al.* (2013) and Malapit *et al.* (2017) – a multidimensional framework that captures crucial intangible dimensions such as self-esteem, community leadership and intra-household bargaining power. Finally, this study provides rigorous empirical evidence aimed at guiding the design of inclusive land policies and aligning national legal frameworks with the sustainable development goals related to gender equality.

The paper is structured into three sections. The first section details the methodological framework, describing the dataset used, the econometric specification of the double-censored model and the construction of the WEAI variables. The second section presents empirical results and discusses the key insights in the light of the existing literature. The third and final section formulates the main policy implications and outlines directions for future research.

## 2. Methodology used for analysis

### 2.1 Theoretical framework

Empowerment is a polysemic and difficult concept to measure. This is why Sen's capability approach (1983, 1995) is suitable for its analysis. The empowerment of women is therefore synonymous with women's capacity building.

To understand the theoretical framework of empowerment, this article uses Sen's approach (1983, 1995), according to which women's poverty can be explained by their lack of capabilities. Indeed, Sen (1987) distinguishes and rejects the welfarist and resourceist schools of thought, which state that

poverty is the result of either a lack of resources or an inability to satisfy basic needs. According to Sen (1995), poverty is instead the result of a lack of capabilities.

Drawing on Sen's capability approach (1980, 1981, 1999), Kabeer (1999) defines an analytical framework for women's situations, in which women's empowerment is viewed as a process that enhances their ability to make strategic life choices. She identifies three dimensions of empowerment: resources, agency and achievements. This model suggests that access to resources (whether material, human or social) constitutes an indispensable precondition that enables the exercise of 'agency' – the ability to define one's own goals and make strategic life decisions. Finally, this decision-making process is realised through achievements, representing the concrete outcomes and observed changes in well-being. Thus, empowerment is not merely a matter of being endowed with means; it is part of a journey where the freedom of choice transforms initial potential into tangible results for women.

## 2.2 Analytical model

This paper analyses the effect of access to arable land on women's empowerment in Burkina Faso from a multidimensional perspective. Measuring empowerment is complex and represents a major challenge for researchers (Kabeer 1999; Kishor 2005).

### 2.2.1 Women's empowerment in agriculture index

The Women's Empowerment in Agriculture Index (WEAI) is a multidimensional index composed of two sub-indices: the Five Domains of Empowerment (5DE) Index, which measures the levels of empowerment for women and men in these agricultural domains, and the Gender Parity Index (GPI), which measures the empowerment gap that women need to close to achieve the level of autonomy of men in the same household (International Food Policy Research Institute [IFPRI] 2022). Developed by Alkire *et al.* (2013), the WEAI was designed as a monitoring and evaluation tool to directly measure the level of women's empowerment and inclusion in the agricultural sector (Malapit *et al.* 2017).

The first sub-index evaluates the empowerment of women (and men) in five domains: (1) agricultural production decision-making; (2) access to and power over productive resources; (3) control over income use; (4) community leadership; and (5) time allocation. These five domains have the same weight in the sub-index calculation. This sub-indicator is called the 5DE after the five domains of empowerment mentioned above and is frequently mentioned in the literature (Alkire *et al.* 2013). The 5DE is measured by 10 indicators with different weightings (see Table 1).

The 5DE contributes 90% to the WEAI. Its value ranges from 0 to 1 (or 0% to 100%). According to Alkire *et al.* (2013), a person is empowered if their empowerment score is greater than or equal to 80% in all five domains. First, a non-empowerment index ( $M_0$ ) is constructed, which ranges from 0 to 1. Then, the complement to one ( $1 - M_0$ ) of this index is calculated (Alkire *et al.* 2013).  $M_0$  is obtained by multiplying the proportion of non-empowered individuals ( $H$ ) with the average non-empowerment score ( $A$ ) observed in the subgroup of these non-empowered individuals.  $A$  reflects the average of the weighted sum of the 5DE indicators for the subgroup of non-empowered individuals.

$$5DE = 1 - M_0 \text{ où } M_0 = H * A \quad (1)$$

The Gender Parity Index (GPI) accounts for 10% of the WEAI. It is based on the difference in empowerment levels between women and men identified as the main adult decision-makers in each

household (Alkire *et al.* 2013). It indicates the proportion of women whose adequate achievement of the 5DEs is as high as that of the men in their household (Alkire *et al.* 2013).

The WEAI takes gender equality into account. This is because several studies have shown that omitting this phenomenon has negative effects on household (agricultural) productivity, as well as on children's health, education and nutrition (Quisumbing 2003).

$H\_GPI$  is the proportion of women with a 5DE score lower than that of men, while  $I\_GPI$  represents the average autonomy gap between men and women. The Gender Parity Index ( $GPI$ ) is calculated using Equation (2). Equation (3), on the other hand, provides the formula for calculating the Women's Empowerment in Agriculture Index (WEAI).

$$GPI = 1 - H\_GPI * I\_GPI \quad (2)$$

$$WEAI = 0,9 * 5DE + 0,1 * GPI \quad (3)$$

The WEAI establishes a multidimensional empowerment profile for each man and woman in selected households. This profile shows overlapping results in different areas of empowerment (Alkire *et al.* 2013). Therefore, the WEAI reflects agency at the individual level. It can be subdivided based on socio-economic characteristics such as age, gender and area of residence. Furthermore, the WEAI makes it possible to understand gender inequalities within households through the Gender Parity Index ( $GPI$ ).

However, to account for its operational limitations (Malapit *et al.* 2017), an abbreviated version, called A-WEAI (for abbreviated WEAI), was developed, which, in addition to an estimated time saving of 30%, has the advantage of allowing difficult-to-implement questions to be modified while retaining their relevance (Malapit *et al.* 2017). Consequently, this research uses the abbreviated version.

The A-WEAI retains the 5DE of the original WEAI but uses only six of the 10 indicators. Table 1 presents the 5DE, their indicators, and the weights of these indicators in the calculation of the WEAI, in both the original and the abbreviated versions. The indication of a weight of 0 in the last column simply means that the indicator in question is excluded from the calculation of the A-WEAI. Thus, apart from the domain of productive resources management, for which two indicators are retained, the other empowerment domains are measured using a single indicator in the calculation of the A-WEAI.

In the calculation of the A-WEAI, each indicator records the value "1" if the respondent's answer is appropriate, and "0" otherwise. The value representing an individual's empowerment score is the weighted average of these indicators using their respective weights according to Table 1 (Alkire *et al.* 2013). The empowerment score therefore corresponds to the weighted percentage of the domains in which an individual has reached the appropriate threshold.

### 2.2.2 Empirical model specification

Women's empowerment can be analysed through the capabilities approach (Kabeer 1999), with reference to Sen (1980, 1981, 1999). The 5DE empowerment scores represent the dependent variable. This is a continuous variable with a value ranging from 0 to 1 (or 0% to 100%). According to Alkire *et al.* (2013), an individual is empowered if their empowerment score is greater than or equal to 80% across all five domains.

When the dependent variable is binary or categorical, models such as logit or probit are suitable (Greene 2003). If the dependent variable is continuous, the tobit model is appropriate (Greene, 2012). The tobit model seems to yield better results than the logit and probit models (McWilliams B & Zilberman D 1996) and is therefore suitable for analysing the effect of access to arable land on women's empowerment in Burkina Faso.

**Table 1: Domains, indicators and weights of the women's empowerment in agriculture index**

| Domain     | Indicator                            | Original WEAI weight | A-WEAI weight |
|------------|--------------------------------------|----------------------|---------------|
| Production | Involvement in production decisions  | 1/10                 | 1/5           |
|            | Autonomy in production               | 1/10                 | 0             |
| Resources  | Ownership of assets                  | 1/15                 | 1/10          |
|            | Purchase, sale or transfer of assets | 1/15                 | 0             |
|            | Access to and decisions on credit    | 1/15                 | 1/10          |
| Income     | Control over the use of income       | 1/5                  | 1/5           |
| Leadership | Group membership                     | 1/10                 | 1/5           |
|            | Public speaking                      | 1/10                 | 0             |
| Time       | Workload                             | 1/10                 | 1/5           |
|            | Leisure                              | 1/10                 | 0             |

Source: Adapted from Alkire *et al.* (2013) and Malapit *et al.* (2017)

Based on these theories and the empowerment analysis framework developed by Kabeer (1999) with reference to Sen (1980, 1981, 1999), the empirical model for analysing women's empowerment through agriculture can be represented by the two-sided censored regression model (Alan *et al.* 2011) as an observation of  $(Y; X; L; U)$ . The censoring ranges between 0 and 1. A value of 0 means the respondent is fully disempowered, meaning they do not participate in household decision-making, whereas a value of 1 means the person is fully empowered:

$$Y_{it}^* = \beta'X_{it} + \varepsilon_{it}, i = 1, \dots, N, \quad (4)$$

where  $y_{it}$  is the level of empowerment achieved by women at time  $t$ ;  $X_{it}$  is the vector representing all the resources mobilised (farm income, education and financial assets) by these women to become empowered;  $k$  is the number of these factors, which can be farm characteristics, household characteristics, land tenure security levels and institutional factors; and  $\beta$  is a row vector of  $k$  parameters,  $\varepsilon_{it} \sim N(0, \sigma^2)$ .

$Y_{it}^*$  is not observed, but  $y_{it}$  is observed. If the dependent variable  $y_{it}$  is censored at  $L = 0$  (lower bound) and  $U = 1$  (upper bound), we have:

$$y_{it} = \begin{cases} 0 & \text{if } Y_{it}^* < 0 \\ Y_{it}^* & \text{if } 0 \leq Y_{it}^* \leq 1 \\ 1 & \text{if } Y_{it}^* > 1 \end{cases} \quad (5)$$

### 2.3 Data sources and collection method

This paper uses data from the second harmonised household living conditions survey (EHCVM-2). Carried out in 2021/2022 by the National Institute of Statistics and Demography (INSD), it covered a sample of 7 176 households. In this paper, we are only interested in households with at least one wife and those headed by a single, widowed or divorced mother. The sample size is 6 789 households,

of which 6 123 are households in which a husband and at least one wife live (in each of them), and 666 households that are headed by a wife alone (single mother, widow or divorcee).

In the rest of this research, households with a husband and at least one wife are referred to as “adult male and female households (MHH)”, while households headed by women are referred to as “adult female-headed households (FHH)”. FHH are households where the head is a single mother or someone who has lost her spouse through death or divorce.

## **2.4 Selection and description of model variables**

### **2.4.1 Dependent variable**

The 5DE empowerment scores represent the dependent variable. It is a continuous variable and its value ranges from 0 to 1 (or 0% to 100%). According to Alkire *et al.* (2013), a person is empowered if their empowerment score is greater than or equal to 80% across all five domains.

### **2.4.2 Explanatory variables**

Documentary analysis helped identify a number of variables likely to influence women’s empowerment. Following Allendorf (2007) and Kabeer (1999), we examine women’s education level, their age, their perception of women’s access to land, their decision-making within the household, their access to credit and their place of residence.

#### **2.4.2.1 Variable of interest**

The variable of interest in this paper is women’s access to arable land. Access (legal access or rights-based access) is defined as the ability to benefit from things, whether they be material objects, people, institutions or symbols through law, custom or convention (Ribot & Peluso 2003). It is argued that women’s access to arable land has a positive and significant influence on women’s empowerment in Burkina Faso.

#### **2.4.2.2 Control variables**

A number of economic and sociodemographic factors have been identified to explain levels of women’s empowerment. These factors include women’s education level, age, place of residence, perception of women’s land rights, access to credit, household decision-making, the occurrence of gender-based violence within the household, their engagement in income-generating activities such as agriculture, etc. (Awono *et al.* 2010; Ahenkan & Boon 2011; Bushra & Wajiha 2015; Akram 2018; Richardson 2018).

Education and employment can give women social and economic power by providing them with economic independence and a sense of self-worth (Kabeer 1999; Kishor & Gupta 2004). A positive sign for the effect of the education level variable on women’s empowerment is therefore expected.

Place of residence is an important factor that influences women’s empowerment. Traditional barriers to women’s empowerment are likely stronger and more difficult to overcome in rural areas, where women are often relegated to subordinate roles, than in urban areas (Kabeer 1999; Kishor & Gupta 2004). Therefore, the expected sign of the place of residence variable for women’s empowerment is uncertain.

In South Asian countries, age is an indicator of power, which increases the likelihood of owning and laying claim to land (Kabeer 1999; Kishor & Gupta 2004; Mahmud *et al.* 2012). Consequently, the expected sign of the age variable for women's empowerment is positive. Table 2 summarises the different explanatory variables used and their expected effects on the explained variable.

**Table 2: Explanatory variables of women's empowerment**

| Definition of the variable                                                                     | Variable type | Expected sign |
|------------------------------------------------------------------------------------------------|---------------|---------------|
| 5DE empowerment score                                                                          | Continuous    | Dependent     |
| Woman's age                                                                                    | Continuous    | +/-           |
| Gender of household head: 1 = male; 0 = female                                                 | Binary        | +/-           |
| Woman's educational level: 0 = None; 1 = Primary; 2 = Secondary; 3 = Higher                    | Categorical   | +             |
| Mode of land acquisition: 0 = Land loan; 1 = Purchase; 2 = Gift; 3 = Inheritance; 4 = Marriage | Categorical   | +/-           |
| Agricultural income                                                                            | Quantitative  | +             |
| Household's living environment: 0 = rural; 1 = urban                                           | Binary        | +/-           |
| Household size                                                                                 | Quantitative  | +/-           |
| Woman's marital status: 0 = Single; 1 = Married; 2 = Widowed; 3 = Divorced                     | Categorical   | +/-           |
| Access to arable land: 1 = Access; 0 = otherwise                                               | Binary        | +             |

Source: Author

### 3. Results and discussion

#### 3.1 Descriptive statistics

Table 3 presents the descriptive statistics for the quantitative variables used in Equation (5). It shows that the average empowerment score across the five empowerment domains is 29%, or (0.29). On average, the surveyed individuals are empowered in 29% of the domains considered in the A-WEAI calculation. The main finding is that the majority of both women and men are empowered in less than 80% of the empowerment domains considered in the A-WEAI.

In MHH, the average empowerment score is 26.49%, while for FHH it is 53.93%, a difference of more than 25 percentage points (Table 3). These women are therefore empowered in two out of the five empowerment domains (5DE) considered in the A-WEAI calculation. However, there are other people who assist these female heads of household in agricultural decision-making. The eldest boys intervene in these decisions even if their mothers are the masters in the field (Sawadogo 2024).

The analysis of 5DE scores by gender and place of residence reveals that, at the national level, the empowerment index for women and men is 0.78 and 0.94, respectively. For women, the 5DE scores in urban and rural areas are identical (0.78). As for men, the 5DE scores in urban and rural areas are 0.94 and 0.95, respectively. The place of residence has a slight impact on men's empowerment.

Table 3 shows that the average agricultural income for MHH is 200 799 FCFA<sup>1</sup>, compared to 180 786 FCFA for FHH. Thus, on average, FHH earn less agricultural income than MHH. The average household size is six people. The average age for male heads of household (or surveyed men) in MHH is 45, compared to 52 for female heads of household (or surveyed women) in FHH (Table 3). Table 3 also shows that the average age of the surveyed women in MHH is 40, which is lower than that of their spouses, which is 45, a mean age difference of five years.

<sup>1</sup> CFA Franc

**Table 3 : Descriptive statistics of quantitative variables**

| Variables                 | Sub-sample | Observations | Mean      | Std dev   | Min. | Max.      |
|---------------------------|------------|--------------|-----------|-----------|------|-----------|
|                           | MHH        | 6 123        | 26.49     | 26.11     | 0    | 100       |
| Empowerment score (%)     | FHH        | 666          | 53.93     | 30.31     | 0    | 100       |
|                           | Total      | 6 789        | 29.18     | 27.77     | 0    | 100       |
|                           | MHH        | 6 123        | 200 799.6 | 485 102.5 | 0    | 9 000 000 |
| Farm income (in FCFA)     | FHH        | 666          | 180 786.5 | 430 306.1 | 0    | 4 050 000 |
|                           | Total      | 6 789        | 198 836.3 | 480 011.5 | 0    | 9 000 000 |
|                           | MHH        | 6 123        | 6.86      | 3.99      | 2    | 24        |
| Household size            | FHH        | 666          | 4.42      | 2.88      | 1    | 13        |
|                           | Total      | 6 789        | 6.62      | 3.96      | 1    | 24        |
|                           | MHH        | 6 123        | 45.42     | 14.11     | 16   | 96        |
| Age of the household head | FHH        | 666          | 52.58     | 15.19     | 19   | 92        |
|                           | Total      | 6 789        | 46.12     | 14.38     | 16   | 96        |
|                           | MHH        | 6 123        | 40.45     | 12.42     | 16   | 90        |
| Age of the surveyed woman | FHH        | 666          | 52.58     | 15.19     | 19   | 92        |
|                           | Total      | 6 789        | 47.96     | 15.37     | 16   | 92        |

Note: MHH = male-headed households; FHH = female-headed households

Source: Built by the author from EHCVM-2 2021–2022 data

Table 4 presents descriptive statistics for the qualitative variables used in Equation 5. Overall, 67.3% of the household heads are illiterate. For female-headed households (FHHs) and male-headed households (MHHs), the illiteracy rates for household heads are 66.08% and 75.83%, respectively. The primary education rate for household heads in MHHs and FHHs is 23.99% and 16.07%, respectively. It is 23.21% for the overall sample.

As for the education level variable, the illiteracy rate for women in the sample is 72.47%. At the primary, secondary and higher education levels, the rates are 17.86%, 6.05%, and 3.63% respectively. The illiteracy rate for women exceeds that of men by nearly 10 percentage points.

The analysis of the gender factor shows significant heterogeneity in the sample. Gender is one of the key factors in analysing the explanatory factors of access to land. Of the 6 789 households in the sample, only 15.83% are headed by women, compared to 84.17% by men.

The consideration of marital status shows that, in the sample, 1.31% of household heads are single (single mothers), 90.19% are married (men surveyed), 7.51% are widowed women, and 0.99% are divorced women. As for women's access to land (the variable of interest), 48.65% of women have access to land, compared to 51.35% who are deprived of agricultural land.

The analysis of land acquisition methods reveals that, in the sample, land is primarily acquired through inheritance (36.56%). Other channels for women to acquire land are marriage, gifts and purchase, with occurrences of 2.05%, 4.42% and 0.57%, respectively. In addition 56.40% of women could only acquire agricultural land as a loan, which does not provide a guarantee for the sustainability of agricultural operations.

The analysis in Table 4 shows that, in the sample, 45.71% of the surveyed households reside in rural areas compared to 54.29% living in urban areas. For MHHs and FHHs, these rates are 44.29% and 58.71% in urban areas, respectively. In rural areas, these rates are 55.71% for MHHs and 41.29% for FHHs.

**Table 4: Descriptive statistics of qualitative variables**

| Variables                              | Modality    | MHH         |               | FHH         |               | Sample      |               |
|----------------------------------------|-------------|-------------|---------------|-------------|---------------|-------------|---------------|
|                                        |             | Sample size | Frequency (%) | Sample size | Frequency (%) | Sample size | Frequency (%) |
| Head of households' level of education | Illiterate  | 4 046       | 66.08         | 505         | 75.83         | 4 551       | 67.03         |
|                                        | Primary     | 1 469       | 23.99         | 107         | 16.07         | 1 576       | 23.21         |
|                                        | Secondary   | 374         | 6.11          | 29          | 4.35          | 403         | 5.94          |
|                                        | Higher      | 234         | 3.82          | 25          | 3.75          | 259         | 3.81          |
| Interviewed woman's level of education | Illiterate  | 274         | 66.99         | 505         | 75.83         | 779         | 72.47         |
|                                        | Primary     | 85          | 20.78         | 107         | 16.07         | 192         | 17.86         |
|                                        | Secondary   | 36          | 8.80          | 29          | 4.35          | 65          | 6.05          |
|                                        | Higher      | 14          | 3.42          | 25          | 3.75          | 39          | 3.63          |
| Head of household's gender             | Female      | 409         | 6.68          | 666         | 100           | 1 075       | 15.83         |
|                                        | Male        | 5 714       | 93.32         | 0           | 0             | 5 714       | 84.17         |
| Head of household's marital status     | Single      | 0           | 0             | 89          | 13.36         | 89          | 1.30          |
|                                        | Married     | 6 123       | 100           | 0           | 0             | 6 123       | 90.19         |
|                                        | Widowed     | 0           | 0             | 510         | 76.58         | 510         | 7.51          |
|                                        | Divorced    | 0           | 0             | 67          | 10.06         | 67          | 0.99          |
| Land acquisition method                | Land loan   | 3 341       | 54.56         | 488         | 73.27         | 3 829       | 56.40         |
|                                        | Purchase    | 38          | 0.62          | 1           | 0.15          | 39          | 0.57          |
|                                        | Gift        | 285         | 4.65          | 15          | 2.25          | 300         | 4.42          |
|                                        | Inheritance | 2 374       | 38.77         | 108         | 16.22         | 2 482       | 36.56         |
|                                        | Marriage    | 85          | 1.39          | 54          | 8.11          | 139         | 2.05          |
| Access to land                         | No access   | 2 231       | 36.14         | 342         | 51.35         | 2 555       | 37.63         |
|                                        | Access      | 3 910       | 63.86         | 324         | 48.65         | 4 234       | 62.37         |
| Place of residence                     | Urban       | 2 712       | 44.29         | 391         | 58.71         | 3 103       | 45.71         |
|                                        | Rural       | 3 411       | 55.71         | 275         | 41.29         | 3 686       | 54.29         |

Source: Built by the author from EHCVM-2 2021–2022 data

### 3.2 Econometric regression results for women's autonomy status

Based on the statistical results, it seems clear that access to arable land explains women's empowerment. This section aims to test the existence of an econometric link between access to arable land and the level of women's empowerment. Table 5 presents the results of the double-censored 5DE score regressions on the overall sample.

#### 3.2.1 Model diagnostic test results

The model diagnostic tests include the test for multicollinearity between the explanatory variables, the correlation test, and the test for overall model significance. To check for the presence of multicollinearity among the explanatory variables, an analysis of the variance inflation factors (VIF) of the coefficients obtained after OLS regression was performed. There was no multicollinearity issue among the retained explanatory variables, as all calculated VIFs were below 4. In addition, the average VIF was 1.46.

#### 3.2.2 Presentation of the results of the double-censored empowerment score regression

Based on the results of the preliminary tests, it is clear that the econometric model (Equation (5)) can be estimated using the double-censored method. The regression results are recorded in Table 5. These regressions were first performed on the entire sample, then on the subsample of women, and finally on the subsample of men. This involved three double-censored regressions of Equation (5), but on different samples. Generally, Table 5 shows that the three estimated models are globally significant with regard to the null probabilities associated with the Fisher statistics. Also, access to agricultural land positively and significantly explains the 5DE scores in the overall sample, in both the female-

headed households (FHH) and male-headed households (MHH). Thus, access to arable land contributes to the empowerment of both women and men.

The analysis of the double-censored tobit model regression results for the overall sample (Table 5) shows that the coefficient associated with the variable of interest (women's access to arable land) is positive (0.030) and significant at the 5% level. Thus, access to arable land helps to strengthen women's empowerment. This result confirms the work of Agarwal (1994), Haddad *et al.* (1997) and Quisumbing and Maluccio (2003). These authors state that women's access to land and control over household assets strengthen their self-esteem, decision-making and empowerment within the household.

Furthermore, educational attainment emerges as a major differentiating factor. The results indicate a positive and significant correlation (at the 1% level) between the level of education (primary, secondary or higher) and the empowerment score, compared to illiterate individuals. These findings support the notion that human capital enhances analytical skills and the capacity to engage actively in household decision-making spheres (Kabeer 1999).

Regarding the mode of acquisition of arable land, the analysis (Table 5) reveals that the variable for the mode of acquisition of agricultural plots is significant. Indeed, the primary channels through which women acquire arable land are inheritance, gift and purchase. Within the sample, the coefficients associated with acquisition through purchase, gift and inheritance are positive and significant at the 5%, 1% and 5% levels, respectively. These results corroborate the work of Mariatou (2011), confirming that inheritance and marriage remain the traditional pillars through which women acquire land in Burkina Faso.

Moreover, the coefficients for the variables of woman's age (-0.001), sex of the household head (-0.394), marital status (-0.083) and household size (-0.004) are negative and significant. The analysis of the results (Table 5) reveals a negative and significant relationship between a woman's age and her level of empowerment (5DE score) across all models (FHH, MHH, and the overall sample). These findings contradict a portion of the classical literature (Kabeer 1999; Kishor & Gupta 2004), which regards age as a vector for autonomy and control over household resources. However, several arguments can be put forward to justify this trend within the specific context of Burkina Faso.

The negative effect of age could reflect a decline in the physical capacity of senior women, limiting their direct involvement in demanding agricultural work. By losing their status as active producers, these women may see their decision-making influence erode in favour of younger, more productive household members – a phenomenon observed in certain sub-Saharan rural areas where decision-making power is intrinsically linked to physical contribution to household income. Furthermore, a cohort effect suggests that younger generations, being better educated, benefit from greater access to awareness programmes on women's rights than their elders, who remain more deeply rooted in restrictive traditional social norms internalised over time.

The results demonstrate that household size negatively influences women's empowerment in Burkina Faso, regardless of the household type (MHH, FHH, or the overall sample). An increase in the number of members in MHHs, FHHs and the global sample leads to a decrease in the 5DE score of 0.003, 0.022 and 0.004, respectively, *ceteris paribus*. This result aligns with our expectations, as well as with the findings of other authors, such as Kabeer (1999), Sridevi (2005) and Akram (2018).

The analysis of marital status reveals that only the "widow" status in the global sample and MFSs is negative and significant at the 1% level. Widowhood negatively impacts women's autonomy,

reducing their 5DE score by 0.083, *ceteris paribus*. This vulnerability is primarily explained by the conditions of land access in Burkina Faso: as land is mainly acquired through marriage or inheritance (Mariatou 2011), the loss of a spouse directly undermines the socio-economic status of women.

**Table 5: Results of the empowerment score regression using the double-censored Tobit model**

|                               | Overall sample |                | MHH         |                | FHH         |                |
|-------------------------------|----------------|----------------|-------------|----------------|-------------|----------------|
| Empowerment score             | Coefficient    | Standard error | Coefficient | Standard error | Coefficient | Standard error |
| Access to land                | 0.030**        | 0.014          | 0.029*      | 0.015          | 0.020       | 0.045          |
| Woman's age                   | -0.001***      | 0.003          | -0.007**    | 0.0003         | -0.006***   | 0.001          |
| Education level               |                |                |             |                |             |                |
| <i>Illiterate = reference</i> |                |                |             |                |             |                |
| Primary school                | 0.053***       | 0.011          | 0.052***    | 0.011          | 0.100**     | 0.048          |
| Secondary school              | 0.126***       | 0.021          | 0.143***    | 0.021          | -0.131**    | 0.089          |
| Higher education              | 0.163***       | 0.024          | 0.171***    | 0.025          | -0.046      | 0.089          |
| Household size                | -0.004***      | 0.001          | -0.003***   | 0.001          | -0.022***   | 0.005          |
| Residential area              | -0.019         | 0.011          | -0.017      | 0.011          | -0.049      | 0.041          |
| Sex of household head         | -0.394         | 0.019          | -0.398***   | 0.019          | 0.000       | 0.000          |
| <i>Land loan = reference</i>  |                |                |             |                |             |                |
| Purchase                      | 0.0123**       | 0.062          | 0.177*      | 0.062          | 0.215       | 0.328          |
| Gift                          | 0.073***       | 0.024          | 0.069***    | 0.024          | 0.131       | 0.109          |
| Inheritance                   | 0.032**        | 0.013          | 0.034**     | 0.013          | 0.008       | 0.055          |
| Marriage                      | 0.009          | 0.033          | -0.002      | 0.041          | -0.004      | 0.064          |
| Marital status                |                |                |             |                |             |                |
| <i>Married = reference</i>    |                |                |             |                |             |                |
| Single                        | -0.050         | 0.042          | 0.000       | 0.000          | -0.05       | 0.042          |
| Widowed                       | -0.083***      | 0.025          | 0.000       | 0.000          | -0.083***   | 0.025          |
| Divorced                      | 0.005          | 0.048          | 0.000       | 0.000          | 0.005       | 0.048          |
| Agricultural income           | -0.004         | 0.003          | -0.004      | 0.003          | 0.0007      | 0.013          |
| Constant                      | 0.686***       | 0.051          | 0.674***    | 0.052          | 0.957***    | 0.184          |
| Observations                  | 6 789          |                | 6 123       |                | 666         |                |
| Pseudo R <sup>2</sup>         | 0.226          |                | 0.185       |                | 0.141       |                |
| LR Chi <sup>2</sup>           | 862.40         |                | 576.47      |                | 57.84       |                |
| Prob > Chi <sup>2</sup>       | 0.000          |                | 0.000       |                | 0.000       |                |

Note: \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

Source: Built by the author from EHCVM-2 2021–2022 data

#### 4. Conclusion and implications for economic policy

This paper has analysed the effects of access to arable land on women's empowerment in Burkina Faso. The data used for this analysis are derived from the second Harmonised Survey on Household Living Conditions (EHCVM2 2021/2022). The methodology employed combines statistical and econometric analyses. In the statistical analysis, the A-WEAI empowerment index was calculated both with and without consideration of access to arable land. In the econometric analysis, the 5DE scores of the respondents were regressed against socio-economic characteristics using the double-censored method. The results demonstrate that the variable of interest – access to arable land – positively influences women's empowerment in Burkina Faso. Control variables, such as educational

level and the method of land acquisition, also positively influence empowerment levels. In contrast, the results reveal that age, marital status, household size and the gender of the household head negatively influence the level of women's empowerment in the country.

In summary, this research has demonstrated that access to arable land constitutes an essential lever for strengthening women's empowerment in Burkina Faso. These findings argue for targeted political action, beginning with a reform of inheritance law to eliminate land discrimination. Simultaneously, simplifying registration procedures would allow for the inclusion of rural women, whose low literacy rates often act as a barrier. Finally, supporting women's cooperatives through the creation of local processing units is essential to enable them to fully capture the added value of their production, restricting the range of possibilities and opportunities offered to women and girls reduces a country's development potential.

Whilst this study offers vital perspectives, it faces notable methodological and contextual limitations. Firstly, the cross-sectional nature of the EHCVM data restricts the analysis to a specific period, preventing the observation of empowerment trajectories over the long term. Secondly, the focus on access overlooks the qualitative reality of land in Burkina Faso, where women often inherit less fertile plots. Finally, the reliance on self-reporting for the A-WEAI index introduces a subjectivity bias, as social norms may encourage respondents to downplay their actual decision-making power to conform to household expectations. Future studies could integrate an analysis of the quality of access by adopting a longitudinal or experimental approach.

## References

- Adekunle CP, Tolorunju ET, Oladele OS & Coster AS, 2024. Rural women's bargaining over land ownership: Evidence from arable crop farming households in Southwest, Nigeria. *Journal of Land and Rural Studies* 12(2): 219–32. <https://doi.org/10.1177/23210249241233065>
- Agarwal B, 1994. *A field of one's own: Gender and land rights in South Asia*. Cambridge, UK: Cambridge University Press.
- Agarwal B, 2018. Gender and land rights: The historical debate and contemporary challenges. *World Development* 107: 360–77.
- Ahenkan A & Boon E, 2011. Non-timber forest products farming and empowerment of rural women in Ghana. *Environment, Development and Sustainability* 13(5): 863–78. <https://doi.org/10.1007/s10668-011-9295-7>
- Akram N, 2018. Women's empowerment in Pakistan: Its dimensions and determinants. *Social Indicators Research* 140(2): 755–75. <https://doi.org/10.1007/s11205-017-1793-z>
- Alan S, Honoré BE, Hu L & Leth-Petersen S, 2011. Estimation of panel data regression models with two-sided censoring or truncation. Working Paper No. 2011-08, Federal Reserve Bank of Chicago, Chicago, IL. <https://www.econstor.eu/bitstream/10419/70592/1/672618516.pdf>
- Alkire S, Meinzen-Dick R, Peterman A, Quisumbing A, Seymour G & Vaz A, 2013. The Women's Empowerment in Agriculture Index. *World Development* 52: 71–91. <https://doi.org/10.1016/j.worlddev.2013.06.007>
- Allendorf K, 2007. Do women's land rights promote empowerment and child health in Nepal? *World Development* 35(11): 1975–88.
- Awono A, Ndoeye O & Preece L, 2010. Empowering women's capacity for improved livelihoods in non-timber forest product trade in Cameroon. *International Journal of Social Forestry* 3(2): 151–63.
- Bushra A & Wajiha N, 2015. Assessing the socio-economic determinants of women empowerment in Pakistan. *Procedia – Social and Behavioural Sciences* 177, 3–8. <https://doi.org/10.1016/j.sbspro.2015.02.321>

- De Janvry A & Sadoulet E, 2001. Income strategies among rural households in Mexico: The role of off-farm activities. *World Development* 29(3): 467–80.
- Doss C & Meinzen-Dick RS, 2020. Land tenure security for women: A conceptual framework. *Land Use Policy* 99: 105080.
- Dossou-Cadja SCR, 2020. Hello can you hear me? On climate change: Inequalities and gender vulnerability in Benin. *African Journal of Land Policy and Geospatial Sciences* 3(2): 116–27.
- Greene WH, 2012. *Econometric analysis*. Seventh edition. Hoboken, NJ: Prentice Hall.
- Haddad L, Hoddinott J & Alderman H, 1997. Intrahousehold resource allocation in developing countries: Models, methods, and policy. *Food and Nutrition Bulletin* 19(1): 71–2.
- Han Y, Huang W, Jin S & Li X, 2019. Measuring agricultural total factor productivity in China (1978–2017): A spatial DEA approach. *Journal of Cleaner Production* 239: 118029.
- Hong M, Zhou D & Lou L, 2024. Study of the impact of rural land transfer on the status of women in rural households. *Land* 13(1): 107. <https://doi.org/10.3390/land13010107>
- International Food Policy Research Institute (IFPRI), 2022. Women's empowerment in agriculture index (WEAI). <https://www.ifpri.org/project/weai/>
- Kabeer N, 1999. Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change* 30(3): 435–64. <https://doi.org/10.1111/1467-7660.00125>
- Kishor S, 2005. A focus on gender: Collected papers on gender using DHS data. <https://dhsprogram.com/publications/publication-od32-other-documents.cfm>
- Kishor S & Gupta K, 2004. Women's empowerment in India and its states: Evidence from the NFHS. *Economic and Political Weekly* 39(7): 694–712.
- Lambrecht IB, Mahrt K, Synt NLK, Win HE & Win KZ, 2023. Gender gaps in land rights: Explaining different measures and why households differ. *Agricultural Economists* 54(5): 728–41.
- Mahmud S, Shah NM & Becker S, 2012. Measurement of women's empowerment in rural Bangladesh. *World Development* 40(3): 610–9.
- Malapit HJL, Pinkstaff C, Sproule K, Kovarik C, Quisumbing AR & Meinzen-Dick RS, 2017. The abbreviated Women's Empowerment in Agriculture Index (A-WEAI). IFPRI Discussion Paper No. 1647, Washington DC: International Food Policy Research Institute.
- Mariatou K, 2011. Women and land: Pedagogical files to understand, ask good questions and act on land tenure in West Africa. Technical Committee on Land Tenure and Development.
- McWilliams B & Zilberman D, 1996. Time of technology adoption and learning by using. *Economics of Innovation and New Technology* 4(2): 139–54.
- Meinzen-Dick RS, Quisumbing AR, Doss C & Theis S, 2019. Women's land rights as a pathway to poverty reduction: Framework and review of available evidence. *Agricultural Systems* 172: 72–82.
- Moser CON, 1989. Gender planning in the Third World: Meeting practical and strategic gender needs. *World Development* 17(11): 1799–825.
- Morsy H & Mukasa AN, 2019. Youth jobs, skill and educational mismatches in Africa. African Development Bank Working Paper Series No. 326. <https://www.afdb.org/en/documents/working-paper-326-youth-jobs-skill-and-educational-mismatches-africa>
- Nikiema PR & Kponou MKC, 2021. Women's empowerment in agriculture and child nutritional outcomes in rural Burkina Faso. AERC Research Paper No. 490, African Economic Research Consortium, Nairobi.
- Quisumbing AR (ed.), 2003. *Household decisions, gender, and development: A synthesis of recent research*. Washington, DC: International Food Policy Research Institute.
- Quisumbing AR & Maluccio JA, 2003. Resources at marriage and intrahousehold allocation: Evidence from Bangladesh, Ethiopia, Indonesia, and South Africa. *Oxford Bulletin of Economics and Statistics* 65(3), 283–327. <https://doi.org/10.1111/1468-0084.t01-1-00052>

- Rao N, Sathe R & Grist N, 2025. Gender, intersectionality and climate smart agriculture in South Asia: A review. *PLOS Climate* 4(2): e0000482. <https://doi.org/10.1371/journal.pclm.0000482>
- Ribot JC & Peluso NL, 2003. A theory of access. *Rural Sociology* 68(2): 153–81.
- Richardson RA, 2018. Measuring women’s empowerment: A critical review of current practices and recommendations for researchers. *Social Indicators Research* 137(2), 539–57. <https://doi.org/10.1007/s11205-017-1622-4>
- Sawadogo S, 2024. Contribution of non-timber forest products to women’s empowerment: Evidence from South Burkina Faso. *African Journal of Economic and Sustainable Development* 9(4): 284–310. <https://doi.org/10.1504/AJESD.2024.139155>
- Sen AK, 1980. *Poverty and famines: An essay on entitlement and deprivation*. Oxford: Clarendon Press.
- Sen AK, 1981. *Poverty and famines: An essay on entitlement and deprivation*. Oxford: Oxford University Press.
- Sen AK, 1983. Development: Which way now? *The Economic Journal* 93(372): 745–62.
- Sen AK, 1987. The standard of living: Lectures I and II, in G. Hawthorn (Ed.), *The standard of living: The Tanner lectures* (pp. 1–38). Cambridge: Cambridge University Press.
- Sen AK, 1995. *Commodities and capabilities*. Oxford: Oxford University Press.
- Sen AK, 1999. *Development as freedom*. New York: Knopf.
- Sridevi TO, 2005. Empowerment of women: A systematic analysis. [https://www.researchgate.net/publication/242320774\\_Empowerment\\_of\\_Women\\_A\\_Systematic\\_Analysis](https://www.researchgate.net/publication/242320774_Empowerment_of_Women_A_Systematic_Analysis)
- Sultana T, Mahmud KT, Moniruzzaman Md & Tareque M, 2024. Impact of access to land on women’s economic well-being: An empirical evidence from rural Bangladesh. *SAGE Open* 14(1): 1–11. <https://doi.org/10.1177/21582440241227705>
- Tavener K & Crane TA, 2019. Beyond “women and youth”: Applying intersectionality in agricultural research for development. *Outlook on Agriculture* 48(4): 316–25.
- UN Women, 2024. Progress on the sustainable development goals: The gender snapshot 2024. <https://www.unwomen.org/sites/default/files/2024-09/progress-on-the-sustainable-development-goals-the-gender-snapshot-2024-en.pdf>