MAKÜ | Journal of Mehmet Akif Ersoy University
Economics and Administrative Sciences Faculty

e-ISSN: 2149-1658
Volume: 13 / Issue: 1
March, 2026
pp.: 171-192

A Multidimensional Approach to Women's Empowerment in Rwanda: What is Missing?

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Abstract

Historically, Rwanda is a rural country where agriculture is the main economic activity of the population. Gender inequality in the country was one of the main problems prior to 1994 genocide. The Rwandan genocide had a devastating impact on the society, with women bearing the brunt of the violence and upheaval. In the years following the genocide, the Rwandan government has made concerted efforts to empower women and promote their participation in political and economic spheres. This study aims to investigate women's empowerment situation in Rwanda by creating a multidimensional empowerment index. For this purpose, the method analysed in Alkire et al. (2013) was applied, using data from the Rwanda Demographic and Health Survey 2019–2020 (NISR, MOH, & ICF, 2021) which covers both rural and urban populations, to explore the barriers to women's empowerment in the aftermath of the genocide. The analysis reveals that many women, especially in rural areas, continue to face significant disadvantages and obstacles to their empowerment. The findings suggest that the primary obstacles to women's empowerment arise from the dimensions of individual agency and the prevalence of violence, particularly in rural areas.

Keywords: Women's Empowerment, Multidimensional Measurement, Deprivation, Rwanda.

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https://doi.org/10.30798/makuiibf.1706087

Article Type	Application Date	Admission Date
Research Article	May 25, 2025	March 17, 2026

To cite this article: Zanbak, M., Sezek, E. N., Soycan, S., and Uysal Oğuz, C. (2026). A multidimensional approach to women's empowerment in Rwanda: What is missing?. *Journal of Mehmet Akif Ersoy University Economics and Administrative Sciences Faculty*, *13*(1), 171-192. https://doi.org/10.30798/makuiibf.1706087

1. INTRODUCTION

Rwanda is mostly known for its history of conflict, the atrocities of the civil war, and the genocide that occurred in the first half of the 1990s. After the bloodshed, the Rwandan government and international institutions aimed to restore peace and stability in the country. The status of women, who suffered the most during the civil war and the genocide, was one of the areas in which the government made considerable efforts. Thus, several laws were introduced to ensure women's empowerment in terms of socio-economic conditions and political rights.

This study aims to investigate the current empowerment situation and to build a multidimensional empowerment index of Rwandan women based on the Demographic and Health Survey (DHS) conducted in 2019–2020 (National Institute of Statistics Rwanda [NISR], Ministry of Health-Rwanda [MOH], & ICF, 2021), which was the latest available data when this research was carried out in December 2023. That survey covers both rural and urban populations. The analysis is constructed on the methodology of "The Women's Empowerment in Agriculture Index-WEIA" by Alkire et al. (2013), which was based on the method of Alkire and Foster (2011a). In this framework, a 3-dimensional measurement was created in which each dimension is represented by five indicators. These dimensions are individual facilities, decision-making, and violence.

The main contribution of this study is to reveal that even though women have become politically empowered as a result of legislative reforms in Rwanda after the genocide, most women are still disadvantaged, especially in rural areas. Therefore, this study underlines the significance of creating a multidimensional empowerment index for Rwandan women in order to make inferences about what needs to be done in terms of socio-economic and political conditions.

Accordingly, the first section of the study provides a brief overview of Rwanda's turbulent history and how it has affected women. The following section presents a summary of the literature focusing on multidimensional poverty and empowerment, with a particular focus on studies that also address poverty in Rwanda. In the subsequent section, the data set used for the measurement of women's empowerment and the preferred methodology are described, and the population structure of the country based on gender, geographical location and employment is detailed. Afterwards, by means of the multidimensional empowerment index analysis, dimension- and indicator-based findings are provided. Finally, policy recommendations regarding women's empowerment in Rwanda are discussed in the conclusion.

2. HISTORY OF CONFLICT AND THE SOCIO-ECONOMIC STATUS OF WOMEN IN RWANDA

Rwanda's history has been marked by periods of extreme violence, especially in the second part of the twentieth century. The tension between Hutu and Tutsi began when the country was under Belgian trusteeship after World War I, when the minority Tutsi were given preference over the Hutu. This policy intensified the hostility amongst people, and violence broke out in 1959 when the Hutu revolted against

the ruling Tutsi. By 1961, around 10,000 Tutsis were killed, and many more were forced to leave Rwanda and became refugees in neighbouring countries. In July 1962, Rwanda gained independence. However, Tutsi guerrilla attacks organised from refugee camps, as well as the socio-economic problems experienced after independence worsened the political strife in the country, with increasing insecurity and instability. The conflict escalated into a civil war that lasted between 1990 and 1993. Despite the signing of the Arusha Agreement between the parties in August 1993, instability continued and led to a genocide against Tutsi and dissenting Hutu in 1994 (Powley, 2005). Some earlier reports and articles estimated that around 500,000 Rwandans were killed in a state-sanctioned massacre (Burnet, 2008; Des Forges, 1999). However, later investigations and articles cited that around one million people were killed within 100 days (Meierhenrich, 2020). Women were targeted throughout the genocide for both their ethnicity and gender; hence, they suffered from torture and sexual abuse (Powley, 2005). It was reported that between 250,000 and 500,000 women were raped in the three months of genocide (Schenk-Day, 2024).

Traditionally, Rwandan women have been considered as dependents of their male relatives, such as their fathers, husbands and male children. Before the genocide, women constituted 51.3 percent of the population. In 1996, 70 percent of the population was female, and 50 percent of all households were headed by women (Human Rights Watch, 1996). As Jayaraman et al. (2007) put, the genocide changed the composition of the population in terms of gender and ethnicity, because millions of people were displaced or killed, affecting also the social and economic structure of Rwanda.

Rwanda was the first Sub-Saharan African country to sign the Convention on the Elimination of Discrimination Against Women (CEDAW) in 1980 and ratified it in 1981. However, the 1984, 1991 and 1993 reports demonstrated that the social and cultural values hindered or weakened the implementation of legislation on women's rights. Regulations regarding women's rights had to be enacted as national law by the government, which was difficult due to gender-based power dynamics and the Rwandan Constitution did not allow for the direct implementation of CEDAW provisions (Kalberer, 2025). For instance, the 1984 Report stated that even though women had an important role in the survival of the family, they were victims of stereotyped attitudes and prejudices, as a result, had an inferior status in the society. It was also mentioned that special measures and programmes were created for rural women, since 92.9 percent of the working population was involved in agriculture (United Nations, 1984). Evidently, most of the women were working in subsistence agriculture on their families' land. Although around 65-70 percent of agricultural work was carried out by women, discriminatory laws prevented them from owning land, while informal discrimination limited their ability to get credit from the financial institutions. Moreover, only 12.21-18.65 percent of already small private sector was made up of women between 1986 to 1990 (Human Rights Watch, 1996).

Before the genocide, women were under-represented in education and politics. In the 1980s, 45 percent of primary school students were girls, while in secondary schools, boys outnumbered girls by 9

to 1, and in higher education, men outnumbered women by 15 to 1. Thus, the levels of illiteracy among women were extremely high because parents preferred to remove their daughters rather than their sons from school when they were faced with economic problems. Similarly, women's representation in politics was extremely low before the genocide. In parliament, women's participation was 17 percent. There were no women appointees in the executive branch of government until 1990, when women constituted a mere 5.3 percent (Human Rights Watch, 1996). Therefore, gender inequality was evident in social, economic and political spheres in Rwanda prior to the genocide. For that reason, after political stability was achieved in the country, several reforms and legislative acts were introduced by the governments to realise gender equality, and these helped the status of women improve, especially in the political sphere.

The most significant step was the 30 percent quota for women in legislation, which was established by the 2003 Constitution, and political parties voluntarily set their own quotas for female candidates on their lists. Less than a decade after the genocide, in 2003, women had nearly half of the parliamentary seats in Rwanda (United Nations Entity for Gender Equality and the Empowerment of Women [UN Women], 2018). The progress continued, and as Burnet (2011) noted, "Rwanda became the first and only country in the world with a majority-female national legislative body" in 2008. It was reported in 2016 that women held 64 percent of seats in the lower house of Rwanda's parliament, the largest share of any country at that time (Warner, 2016). Currently, Rwanda is the first country in the world with female majority in parliament, with 63.8 percent in the Chamber of Deputies and 50 percent in the Senate (Rwanda Parliament, 2025). However, this positive development in legislation is barely reflected in business and other government sectors (Abbott et al., 2018; Burnet, 2011). As a low-income country, Rwanda's economy is largely based on agriculture and animal husbandry. According to Abbott et al. (2020) 83 percent of the population lives in rural areas, 69 percent of working adults are employed in agriculture, and more than 70 percent of households live mostly or entirely on subsistence farming, 75 percent of which do not own enough land to support their families. Only 42 percent of individuals have completed primary school, 16 percent have a post-primary qualification, and 17 percent have never attended school. Evidently, these socio-economic conditions have negative impacts on women's empowerment in Rwanda, which are to be discussed in the following sections.

3. WOMEN, POVERTY, AND EMPOWERMENT: A LITERATURE REVIEW

The concept of empowerment has long been associated with terms such as agency, self-governance, self-determination, emancipation, participation, mobilisation, and self-confidence, as well as within different frameworks. Sen (2017) defines agency as "what a person is free to do and achieve in pursuit of goals or values that he or she considers important" (Ibrahim & Alkire, 2007). In other words, empowerment is about "the extent to which some categories of people are able to control their own destiny, even when their interests are opposed by the interests of other people with whom they interact" (Uphoff, 2005). For a clear understanding of the concept of empowerment, Rowlands (1997)

introduced four categories of power: power over (the ability to resist manipulation); power to (creating new possibilities); power with (acting within a group); and power from within (increasing self-esteem). Chambers (1993) refers to empowerment as a bottom-up process that gives the poor control over their lives and ownership of productive assets to ensure a better livelihood, while Friedmann (1992) argues that empowerment is a bottom-up process that results from moral relationships, territory-based social formations, and the participation of individuals in socially and politically relevant actions. In summary, empowerment refers to the process of giving more power and authority to a person or group in order to enable them to have more control over their own lives and environment (Geha, 2019). While many argue that empowerment requires basic economic resources that improve people's opportunities to earn a better income, several studies focus on the role of microcredit in empowering marginalised social groups, especially women (Samman & Santos, 2009).

3.1. Women's Empowerment

The literature review shows that the studies on women and empowerment in general is scarce. Among those studies focusing on the multidimensional poverty of women in general and advocating for women's empowerment, Alkire et al. (2013) used the Women's Empowerment in Agriculture Index (WEAI), which consists of two sub-indices, to measure the empowerment, effectiveness, and participation of women in agriculture in Bangladesh, Guatemala, and Uganda. For Guatemala, the results show that about 37 percent of households have a powerless woman and a powerful man, compared to 7 percent with a powerful woman and a powerless man. For Bangladesh, these percentages were 17 percent and 21 percent, indicating that there are more households with a strong woman and a weak man than vice versa. Batana (2013), using the multidimensional poverty index across fourteen Sub-Saharan African countries, found that women experience more poverty than men in many dimensions, and education level is the most important factor determining women's poverty level. On the other hand, Wu and Qi (2017) examined the multidimensional poverty among women in China using the fixed effects logistic regression method and found that women experience more severe poverty than men, especially in the education and health dimensions. Zanbak and Soycan (2023) examined the dimensions of multidimensional poverty among women living in Turkey using the multidimensional poverty index and the ordered logistic method. Based on the findings of the study, it is stated that the poverty experienced by women in many dimensions is at a level that cannot be ignored, and in this context, the necessity of developing policies to empower women is emphasized. In this context, Maduekwe et al. (2020) in Malawi, Wei et al. (2021) in Bangladesh, Wanjala (2021) in African countries, Espinoza-Delgado and Klasen (2018) in Nicaragua, Covarrubias (2023) in Mexico, and Rodríguez Guerrero (2021) in Colombia stand out as studies that examine the multidimensional poverty of women living in these countries and make inferences for women's empowerment. The common denominator of all these studies is that the realisation of women's rights and gender equality is central to women's economic empowerment, especially in terms of women's control over their own time, lives,

and bodies, and their greater voice, authority, and meaningful participation in economic decision-making processes at all levels.

3.2. Studies on Rwanda

A rather limited literature on women's empowerment and multidimensional poverty in Rwanda reveals that important studies have been conducted, especially in the last decade. In order to identify the determinants of multidimensional poverty in Rwanda, Salecker et al. (2020) compared the outputs obtained from the monetary poverty index and the Alkire and Foster (2011a) multidimensional poverty index and argued that the monetary poverty rate is much lower based on the results obtained. Among the findings of the study, the results for female-headed households and urban-rural segregation are quite striking. The results of the regression analysis show that female-headed households have a high level of monetary poverty and a relatively low level of multidimensional poverty. Moreover, the increase in the monetary poverty of rural dwellers was found to be higher than the increase in their multidimensional poverty, whereas the opposite was found for urban dwellers. In a similar study, Bikorimana and Sun (2020) conducted an econometric analysis of multidimensional poverty for Rwanda by combining the calculations made with the multidimensional poverty index with the ordered Probit model. While the findings of the study confirm that Rwanda experiences multidimensional poverty, it is found that the standard of living is the dimension that contributes the most to multidimensional poverty in both urban and rural areas. In addition, based on the results obtained from the study, it is strongly emphasised to develop policies to support and empower women in many areas, especially education. Another study examining the dimensions of poverty in Rwanda with econometric models was written by Heshmati and Rashidghalam (2019) by combining Probit and Tobit models with a two-stage poverty index, and according to the results obtained, it was argued that anti-poverty strategies in Rwanda should focus not only on increasing income, but also on improving education, health and basic living conditions.

Slegh et al. (2013) and Niyonkuru and Barrett (2021) emphasise the need for women's empowerment through gender inequality and related poverty in Rwanda. Orrnert (2018), in a similar study, emphasises that women are underpaid compared to men despite doing the same job in many sectors and that gender inequality in Rwanda cannot be ignored. Alkire and Housseini (2014) and Alkire et al. (2017), who examined multidimensional poverty in Sub-Saharan African countries, also compared multidimensional poverty in Rwanda with previous years and stated that there has been an improvement in many dimensions compared to the past. While all these studies emphasise that women living in Rwanda are at the centre of poverty, the importance of women's empowerment and the need for women to participate more in business life by supporting them with education in a conscious society are expressed.

4. METHODOLOGY AND RESEARCH DESIGN

This study uses the data set for Rwanda, which includes the most recent survey data based on the Demographic and Health Surveys (DHS) obtained with the support of the U.S. Agency for International Development, and the data cover both rural and urban populations (descriptive statistics of the women in the sample are shown in Table 1 below). In Rwanda, with a total population of 13,7 million (World Bank, 2023), about 51.4 percent is constituted by females, compared to 48.6 percent for males in 2021 (NISR, 2022, p. 9). A total of 14,634 women participated in the household survey conducted by DHS in Rwanda for 2019–2020. The data used in this study had no information on the ethnicity of the respondents in contrast to previous surveys. As can be seen in Table 1, 14.8 percent of the surveyed women live in Kigali, the capital region, while 15.2 percent live in the northern region and 20.9 percent live in the southern region of the country. Comparatively, 21.69 percent of women who participated in the survey live in the Western region and 27.4 percent in the Eastern region of the country. In general, approximately 80 percent of these women live in rural areas, whereas the remaining 20 percent live in urban areas. Moreover, the surveyed women represent the age group between 15 and 49 years. While 22.3 percent of the women are in the 15–19 year group, 8.3 percent are in the 45–49 year group.

Table 1. Sample Descriptive Statistics of Rwandan Women

Region	**Percent**
Kigali	14.8
South	20.9
West	21.7
North	15.2
East	27.4
Type of place of residence	
Urban	19.9
Rural	80.1
Age (in 5-year groups)	
15-19	22.3
20-24	16.5
25-29	14.2
30-34	14.5
35-39	14.2
40-44	10.2
45-49	8.3

Source: Authors construction based on the Rwanda DHS 2019-2020 (NISR, MOH, & ICF, 2021).

Moreover, in 2019 approximately 82.7 percent of the population lived in rural areas and 17.3 percent in urban areas. In 2020, these rates remained almost unchanged at 82.6 percent rural and 17.4 percent urban (United Nations, 2019). Although the majority of Rwanda's population is engaged in small-scale agriculture and lives in rural settlements, urbanisation is increasing at a slow but steady pace compared to previous years. The relatively low share of the urban population creates an important planning challenge for policymakers, as it increases the need to deliver public services (health, education, infrastructure, etc.) to a geographically dispersed population.

In terms of gender composition, women account for slightly more than 50 percent of Rwanda's total population, and the World Bank's Gender Data Portal shows that this share has been around 51 percent in recent years (World Bank, 2025). However, the 2019 Rwanda national statistics report indicates that 49.5 percent of live births were female, and 51 percent were male, with 82 percent of births occurring in rural areas and 18 percent in urban areas (NISR, 2020). These findings indicate that both the current population and the new generation are largely concentrated in rural areas and that the gender balance in rural and urban areas is quite similar. Furthermore, according to the 2019–2020 Rwanda Demographic and Health Survey (RDHS), the fertility rate of rural women is higher than that of urban women, with the total fertility rate being 4.3 children in rural areas and 3.4 children in urban areas. Hence, rural women give birth to an average of 0.9 more children during their lifetime (NISR, MOH, & ICF, 2020). This situation shows that the young population, and especially the young female population, will continue to be concentrated in rural areas in the coming periods, and therefore it is critical that education, health, and employment policies targeting women are designed with a rural focus.

In terms of female employment, women's participation in the workforce in Rwanda is quite high compared to regional averages, but there are still significant differences compared to men. According to a database compiling series from the World Bank and International Labour Organization (ILO), the employment-to-population ratio for women aged 15+ was approximately 45.6 percent in 2019, rising to 49.3 percent in 2020 (ChartingTheGlobe, 2025). This ratio suggests that approximately 46 out of every 100 women of working age were employed in 2019, while 49 were employed in 2020. While female employment declined in many countries during the COVID-19 period, the increase in Rwanda can be explained partly by the weight of agricultural and informal employment, and partly by the fact that the data covers different survey periods. On the other hand, gender-focused labour force studies show that the employment-to-population ratio for women in rural areas is significantly lower than that for men, and that women are concentrated in low-paid, socially unprotected agricultural jobs, while men have an advantage in accessing paid and urban jobs (NISR, 2023). This situation reveals that the numerically high female employment rates indicate qualitatively fragile and insecure jobs.

Regarding life expectancy, Rwanda has experienced a very rapid improvement since the 2000s. According to World Bank data, life expectancy at birth was approximately 66.7 years in 2019 and around 67.0 years in 2020 (World Bank, 2025). These values place Rwanda among the countries with relatively

high life expectancy in Sub-Saharan Africa. However, the 2019–20 RDHS results show that the under-five mortality rate is 48 per 1,000 live births in rural areas and 35 in urban areas. The findings prove that better access to health services, clean water, and infrastructure in urban areas has increased life expectancy in cities by reducing child and adult mortality rates, while poverty, difficulty accessing health services, and high fertility levels are the main factors limiting life expectancy in rural areas. Moreover, approximately 87 percent of women aged 15–49 have completed at least primary education, demonstrating a substantial improvement in women's educational attainment in recent years (NISR, MOH, & ICF, 2021). The 2019 Labour Force Survey gender thematic report states that among employed women, 66.2 percent are wage employees and 26.3 percent are self-employed, while a considerable number of women still work as contributing family workers (NISR, 2020). Gender-focused assessments for the 2019–2020 period further show that women are particularly concentrated in subsistence agriculture and retail trade and were disproportionately affected by household income losses during the COVID-19 pandemic (UN Women, 2020).

4.1. Methodology

Several instruments have been developed to measure poverty, especially with the purpose of revealing the missing dimension that is largely ignored in international poverty studies. Those missing dimensions could be listed as quality of work, empowerment, physical safety, the ability to go about without shame and humiliation, psychological wellbeing and happiness, social connectedness, and social isolation. Empowerment, which is among these dimensions proving that poverty is not only a monetary phenomenon, expresses how control in the public and private spheres, autonomy, coercion, and the desire to please others shape the actions of individuals (Oxford Poverty and Human Development Initiative [OPHI], 2023). In this study, an empowerment dimension-based index (empowerment index) was calculated for women in Rwanda by using Alkire and Foster's multidimensional poverty measurement method (Alkire & Foster, 2011a; 2011b; Alkire & Santos, 2010). The measurement process, including the multidimensional poverty index (M_0), consists of 14 steps in total, from determining the necessary dimensions to calculating the adjusted AF Family, and comprises multiple poverty indicators.[1] Therefore, in the first step, a dataset containing the latest (2020) data available for this country as of December 2023 was obtained to make the necessary measurements. Subsequently, the data of 14,634 women with complete data on the indicators planned to be used in the measurement process were made suitable for analysis. In the next step, 3 dimensions and 12 indicators were identified to reveal the quality of life and capabilities of women in Rwanda (Table 2). In the following step of the measurement, the limits of deprivation in the indicators detailed below were

[1] The steps required to obtain the multidimensional poverty index and its numerical expressions are presented in detail in Zanbak and Çağatay (2013), Zanbak (2014), and Zanbak (2022).

identified, women's deprivation in each indicator was determined, and a deprivation matrix (Equation 3; Ci) was constructed based on Equations 1 and 2[2] (Alkire & Foster, 2011a).

Table 2. Dimensions, Indicators, Conditions of Deprivation, and Weights

	Indicators	Deprivation condition	Indicator Weight
Individual facilities	Education	Less than 5 years of education (compulsory education)	1/12
	Employment	Has not found a job despite looking for a job in the last 12 months	1/12
	Water	Access time to clean water is 30 minutes or more on foot	1/12
	Electricity	Not available in the household	1/12
Decision-making	Purchase (large household)	Husband/partner/someone else decides "alone"	1/12
	Earnings (use of household income)	Husband/partner/someone else/other decides "alone"	1/12
	Pregnancy (wanted)	Later or not all	1/12
	Health	Husband/partner/someone else/other decides "alone"	1/12
Violence	Physical violence	Yes (less and severe)	1/12
	Emotional violence	Yes	1/12
	Sexual violence	Yes	1/12
	Limit contact with family	Yes	1/12

Source: Authors construction based on the Rwanda DHS 2019-2020 (NISR, MOH, & ICF, 2021).

[2] Indicator

$$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} & \dots & a_{1j} \\ a_{21} & a_{22} & a_{23} & \dots & a_{2j} \\ a_{31} & a_{32} & a_{33} & \dots & a_{3j} \\ a_{41} & a_{42} & a_{43} & \dots & a_{4j} \\ \dots & \dots & \dots & \dots & \dots \\ a_{i1} & a_{i2} & a_{i3} & \dots & a_{ij} \end{bmatrix} \text{ Individual} \quad (1)$$

$$Z = [Z_{11} \quad Z_{12} \quad Z_{13} \quad \dots Z_{1j}] \quad (2)$$

According to the multidimensional poverty measurement method, after calculating the total number of individual deprivations[3](Ci; equation 3), the poverty line (k), which expresses how many dimensions (indicators) the individual should experience deprivation in at least to obtain the index value, should be determined.

Deprivation number matrix (c_i);

$$C_i \begin{bmatrix} c_{11} \\ c_{21} \\ c_{31} \\ .... \\ c_{i1} \end{bmatrix} \quad (3)$$

After comparing the deprivation number (C_i) with the poverty line (k), the multidimensional poor in the sample are identified. Subsequently, the multidimensional poverty index (M_0) is obtained through the adjusted headcount ratio, which is found by multiplying the poverty indicators, i.e., the headcount ratio (H) and the average deprivation ratio (A) (see footnotes 4, 5, 6).

In this study, to obtain the empowerment index, the cut-off was determined at 20 percent, in line with Alkire et al. (2013). These empowerment-deprived women can also be defined as those who face problems in terms of household infrastructure and individual gains, participation in household decision-making mechanisms, and exposure to all forms of violence by their husbands.

The first of the 3 dimensions considered for the calculation of the empowerment index is the *"individual facilities"* dimension, which consists of the education level, employment status, and the physical structure of the household where the individual lives. Whether the individual has received compulsory education, has access to electricity and clean water in the household, and has been employed anywhere in the last 12 months can be listed as the 4 indicators representing the aforementioned dimension.

The second dimension addressed to identify barriers to women's empowerment is the *"decision-making"* dimension. This dimension is represented by the indicator reflecting whether the woman participates in decision-making mechanisms when making large expenditures in the household and the indicator reflecting her status regarding the decision on how to distribute household income. In addition, the other indicators in this dimension are the indicators representing the woman's participation in the decision-making process regarding her own health and regarding her pregnancy, if she was pregnant at the time of the survey.

[3] This total number of deprivations ($c_i = (c_1, c_2, \ldots, c_n)$, which represents the sum of the individual's deprivations in all dimensions, refers to the number of dimensions/indicators that the individual is deprived of.

The third dimension that has an impact on women's capabilities and empowerment is the dimension of *"violence"*. This dimension is represented by 4 indicators in the measurement. Three of these indicators reflect whether the woman has been subjected to psychological, physical, and sexual violence by her husband/partner, and the last one represents whether the woman's contact with her own family is restricted or not by her husband/partner.

As reflected in Table 2, women who have not completed 5 years of compulsory *education* are considered deprived in the education indicator within the "*individual facilities"* dimension. In addition, women who were unemployed despite looking for a job in the last 12 months were included in the analysis as deprived in the *employment* indicator. The deprivation condition for the access to *clean water* indicator is that *access to water* should be within 30 minutes' walking distance. Furthermore, women without *electricity* in their households are also considered deprived in this indicator. For the "decision-making" dimension, the first indicator is whether the woman is involved in the decision to make *major purchases* in the household. If a woman has no say in how major purchases other than daily purchases are made in her household, she is included in the measurement as a deprived woman for this indicator. Similarly, if only the husband/partner decides how to use the household income, the indicator "*use of household income*" is considered absent. In addition, if a woman who was pregnant at the time of the survey had no say in the decision to become *pregnant*, this corresponds to a lack of the relevant indicator. Similarly, a woman not having a say in decisions related to her own *health* is a prerequisite for being included in the measure as deprived. The last dimension in the analysis, representing the *"violence"* dimension, is the fact that women have been subjected to *physical, psychological,* and *sexual violence* by their husbands/partners at any point in their lives, which ensures that they are considered deprived in these indicators. Additionally, another condition of deprivation for the related indicator is the fact that the woman's husband forbids her from *seeing her own family*.

5. EMPIRICAL FINDINGS

After building the indicators and computing the disempowerment index, the results of the empowerment index (1- M_0), for the total population can be seen in Table 3 below. With a cut-off of 20 percent, 52.9 (H) percent of women are disempowered in Rwanda, which means their deprivation ratio is equal to or greater than 20 percent. On the other hand, the average deprivation ratio indicates that Rwandan women have on average inadequate achievements in 35.4 (A) percent of the dimensions. As mentioned in the methodology section, M_0 is calculated by multiplying disempowerment headcount (H) by Average deprivation ratio (A), in other words, H times A (52.9 percent times 35.4 percent), so the disempowerment index or adjusted headcount ratio (M_0) is equal to 0.187. However, since all indicators have the same weight, it can be said that disempowered women experience 18.79 percent of the total possible deprivation that Rwandan women could experience.

$$H = \frac{number\ of\ poor\ people}{population} = \frac{q}{n} = \frac{7{,}741}{14{,}634} = 0.529 \quad (4)$$

$$A = \frac{average\ deprivation}{number\ of\ dimensions} = \frac{\frac{total\ deprivation}{number\ of\ poor\ people}}{number\ of\ dimensions} = \frac{\left(\frac{c_1+c_n}{q}\right)}{d} = \frac{\frac{\sum_1^d c_i}{q}}{d} = 0.354 \quad (5)$$

$$M_0 = H \times A = 0.529\ x\ 0.354 = 0.187 \quad (6)$$

Therefore, it can be said that the disempowerment index (1-M_0) is 0.813.

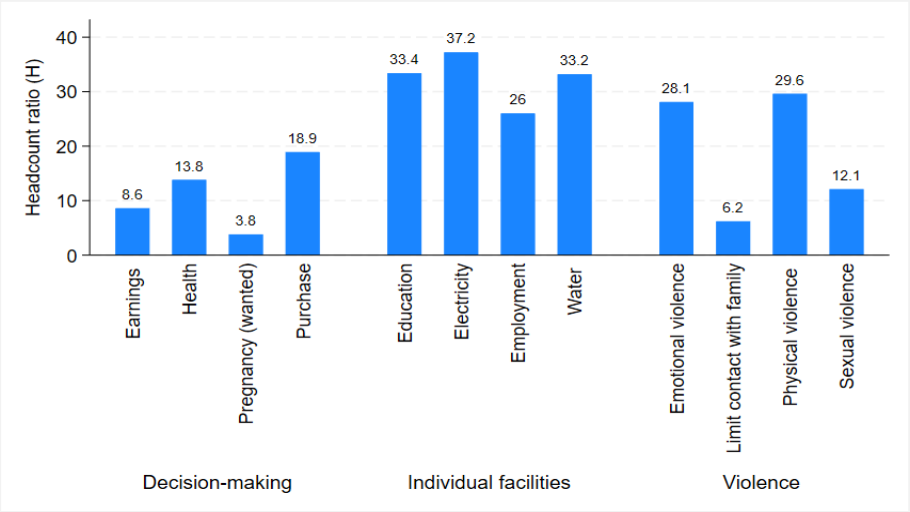
Table 3. Results of the Overall Population

Indexes	Value
Disempowerment Headcount (H)	52.9%
Average deprivation ratio (A)	35.4%
Disempowerment Index (M_0)	0.187
Empowerment Index (1-M_0)	0.813
Number of observations	14634

Source: Authors construction based on the Rwanda DHS 2019-2020 (NISR, MOH, & ICF, 2021).

The following Figure 1 shows the decomposed index as well as the censored headcount ratio for each indicator. Among the disempowered, in the dimension of the "*individual facilities"*, the highest censored headcount ratio is measured on the indicator of *electricity*, in which 37.2 percent of women present deprivation. This means that these women do not have access to electricity in their households. Also, among all the indicators, this is the one with the highest headcount ratio. In this dimension, the second highest headcount ratio is for the indicator of *education* with 33.4 percent; in other words, 33.4 percent of women have deprivation in the present indicator, which means that these women have not completed more than 5 years of education. Thirdly, the indicator of access time to clean *water* still has a relatively high headcount ratio, with 33.2 percent of women experiencing deprivation. Lastly, in this dimension, the indicator of *employment* has the lowest headcount ratio, with 26 percent of women lacking adequacy.

Figure 1. Disempowerment Censored Headcount Ratios by Indicator



Source: Authors construction based on the Rwanda DHS 2019-2020 (NISR, MOH, & ICF, 2021).

In the second dimension, *"decision-making"*, the indicator of large household *purchases* presents the highest headcount ratio, with 18.9 percent of women lacking adequacy. While in the indicator of *health*, 13.8 percent of women cannot decide for their own healthcare. According to the indicator regarding the *earnings*, 8.6 percent of women have no say on how to use household income. On the other hand, in this dimension, the *pregnancy* (wanted) indicator has the lowest headcount ratio, with only 3.8 percent of women experiencing deprivation. Additionally, among all the indicators, the pregnancy (wanted) indicator is the one with the lowest headcount ratio. This means that most Rwandan women have the freedom to decide whether they want to get pregnant or not.

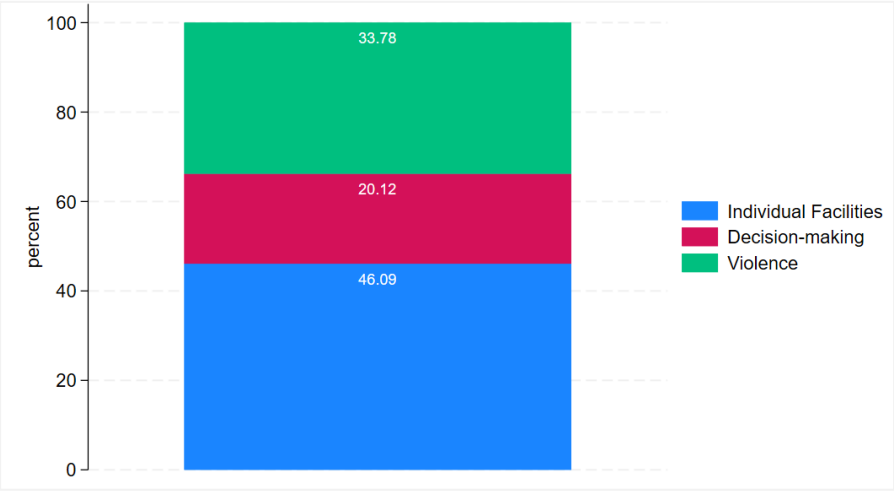
Finally, for the dimension of *"violence"*, the highest headcount ratio is measured on the indicator of *physical violence*, with 29.6 percent of Rwandan women having experienced less or severe physical violence. Following that, the indicator of *emotional violence* has the second highest headcount ratio in this dimension, with 28.1 percent of women lacking adequacy. In terms of the third indicator in this dimension, 12.1 of women state that they experienced *sexual violence*. Additionally, the indicator of *limit contact with family* has the lowest headcount ratio in this dimension, with 6.2 percent of women experiencing deprivation, which means most Rwandan women have the freedom to contact their families.

Based on these results, policies can be prioritised to reduce deprivations in the indicators of electricity and education in the *"individual facilities"* dimension; expenditure and health in the *"decision-making"* dimension; and physical and emotional violence in the *"violence"* dimension.

Overall, 4.83 percent of Rwandan women do not have deprivation in any indicator, while most of the population lacks adequacy between 1 to 5 indicators (almost 90 percent), and only 0.11 percent present deprivation in all the indicators. On the other hand, if we look at each dimension separately, we can find that, in the first dimension, *"individual facilities"*, 12.06 percent of women have adequacy in all the indicators, and most of the population experiences inadequacy in 1 to 3 indicators of this dimension. In the dimension of *"decision-making"*, 65.04 percent of women have adequacy in all indicators, and only 0.38 percent of women experience deprivation in all the indicators of the second dimension. Lastly, in the *"violence dimension"*, 56.09 percent of women have adequacy in all the indicators, while most of the women lack adequacy in the 1 to 2 dimensions, and 3.23 percent of Rwandan women have deprivation in all four indicators of this dimension.

Figure 1 shows the relative contributions of disempowerment by dimension to the adjusted headcount ratio (18.79 percent). According to that, the dimension of *"individual facilities"* is the one with the highest contribution to disempowerment, with 46.09 percent. Following this dimension, *"violence"* is the second dimension with the highest contribution to disempowerment at 33.76 percent. On the other hand, the lowest contribution is the dimension of *"decision-making"* with 20.12 percent.

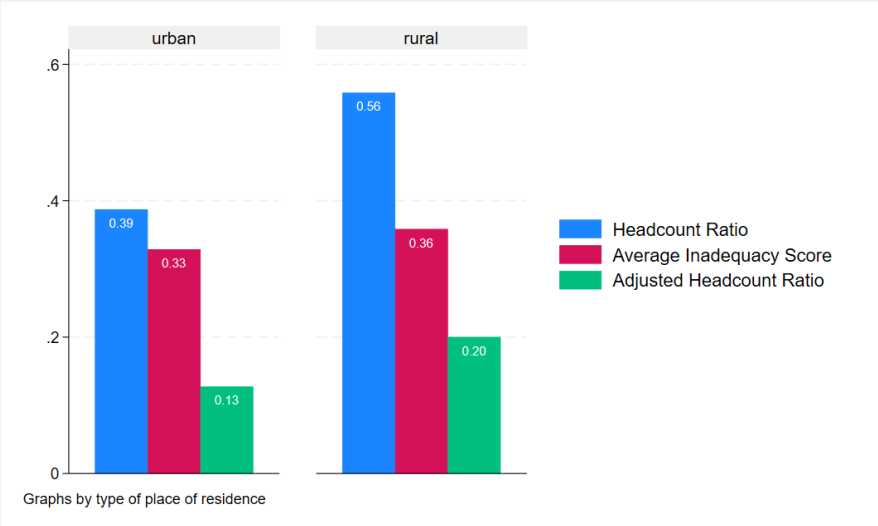
Figure 2. Relative Contributions to Disempowerment by Dimension



Source: Authors construction based on the Rwanda DHS 2019-2020 (NISR, MOH, & ICF, 2021).

Figure 2 and Figure 3 show breakdown results by place of residence and by region. Accordingly, in urban areas, the headcount ratio (H) is 0.39, the average deprivation ratio (A) is 0.33, and the disempowerment index (M_0) is 0.13. In addition to this, in rural areas, the headcount ratio (H) is 0.46, the average deprivation ratio (A) is 0.36, and the disempowerment index (M_0) is 0.20. This means that rural women have a lower adequacy score and are less empowered than urban women in Rwanda.

Figure 3. Result by Place of Residence

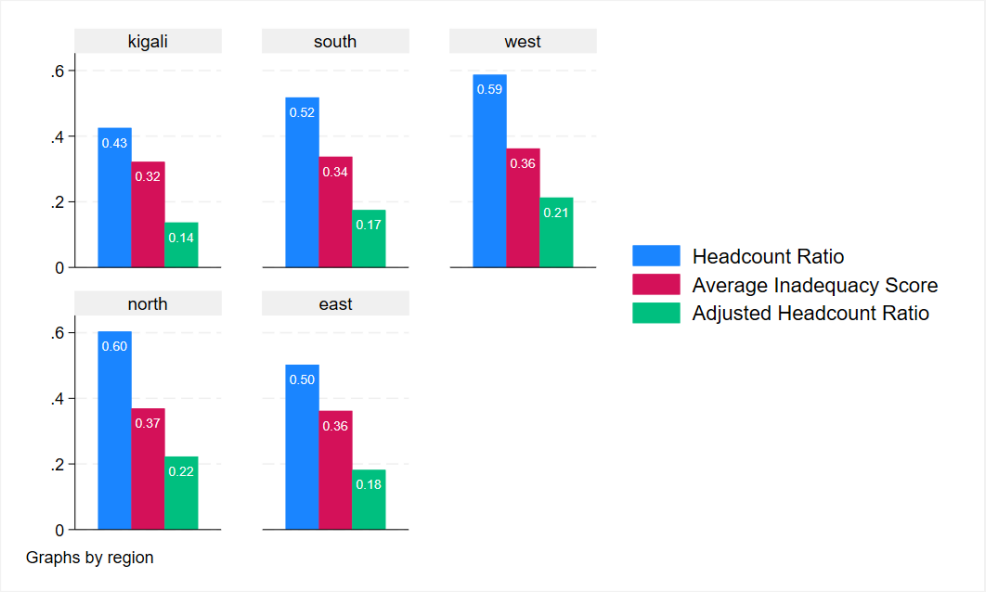


Source: Authors construction based on the Rwanda DHS 2019-2020 (NISR, MOH, & ICF, 2021).

If we look at the regions, we can see that Rwanda's capital region Kigali's adjusted headcount ratio (M_0) is the lowest among the five regions with 0.14. On the other hand, the disempowerment index of the North region is the highest, at 0.22, whereas the disempowerment index in the South region is 0.17, the East is 0.18, and the West is 0.21. This means that Rwandan women who live in the capital

region have a higher adequacy score and are more empowered than those who live in different regions, especially the North and West regions.

Figure 4. Results by Region



Source: Authors construction based on the Rwanda DHS 2019-2020 (NISR, MOH, & ICF, 2021).

In order to obtain the empowerment index, which is the main objective of this study, Equations 7, 8, and 9 were used, and it was found that 7,741 out of 14,634 women in Rwanda lacked at least 4 of the indicators considered and thus were empowerment deprived. In other words, it can be inferred that 52.9 percent of the women in the sample have problems in terms of control, autonomy, coercion, participation in decision-making mechanisms, and exposure to violence, especially in the private/individual sphere, and this negatively affects their actions. This indicates that "1 in 2" women in Rwanda need empowerment support. In addition, the multidimensional empowerment index ($1-M_0$) derived from the headcount ratio (H) and average deprivation ratio (A) was 0.813.

6. CONCLUSION

The aim of this study is to develop a multidimensional empowerment index for Rwandan women, by using data from the country's DHS. The data set used contains the Individual Women's Data for 2019-2020 with 14,634 observations. With the purpose of creating a comprehensive index, the methodology of "The Women's Empowerment in Agriculture Index-WEIA" by Alkire et al. (2013) is used. However, in this research, women's empowerment in general, not only in agriculture, was studied, and accordingly, based on the proposed methodology, the dimensions and variables of the index were selected to the extent permitted by the available data set.

As a result of measurements, among the three dimensions *(individual facilities, decision-making, and violence)* selected for the construction of the women's empowerment index for Rwanda, it has been determined that women experience more deprivation in the *individual facilities* dimension than

in other dimensions. Moreover, when we analysed the indicators one by one, it was observed that access to electricity in this dimension was the indicator with the highest deprivation. Since the fundamental household appliances that are mostly used by women to conduct their daily domestic responsibilities require electricity, having access to this basic utility proves to be highly essential for women's empowerment in Rwanda. Similarly, access to water is another indicator where most of the women suffer from deprivation according to findings of this study. Fetching water from distant sources limits women's participation in economic and social life and increases their burden of taking care of their families. Therefore, one of the main public policies to be implemented in Rwanda should be to provide necessary infrastructure, especially in rural areas, to women who lack access to electricity and water in their houses. After assessing the current situation and outlining the reasons for this problem, necessary measures could be decided with the cooperation of the public and private sectors. The national energy and infrastructure policies should take into consideration the deprivation of rural women, incorporating the responsibilities of local administrations into national development plans.

In the *individual facilities* dimension, it is also observed that a large proportion of Rwandan women had limited access to education for more than five years, thus experiencing noticeable deprivation in this indicator. The national education policies should give priority to the issue of women's disadvantages in accessing education, since most of the socio-economic problems that women are facing in terms of empowerment are directly related to this issue. As well as providing equal educational opportunities to girls and young women, adult literacy programs could also be implemented where necessary. Moreover, the higher unemployment rates among women could also be attributed to their lack of access to education and training opportunities necessary for finding a job, as well as further societal and economic hindrances. In traditional communities, most women are not able to work apart from sustenance farming because they are responsible for raising their families. Therefore, another significant area for reform in Rwanda should be creating equal employment opportunities for women who would like to work outside their homes.

Furthermore, the number of Rwandan women who are suffering physical and emotional violence from their husbands/partners is alarmingly high. This situation underlines the importance of taking legal and administrative actions to prevent domestic violence as well as raising social awareness on the subject. As one of the fundamental steps towards achieving women's empowerment, providing legal, medical, and psychological support for the victims of any kind of domestic abuse should be a priority on the national political agenda.

On a positive note, Rwandan women are more empowered in individual and family decision-making processes such as getting pregnant, or spending household income, as well as keeping in touch with their families without any restrictions imposed by their husbands/partners which resulted in high adequacy in these indicators.

When the results obtained from the index are analysed by region and type of settlement, it is observed that the deprivation rate of women living in rural areas is higher than that of women living in urban areas. Likewise, it can be said that women living in the capital Kigali region, which is one of the more developed regions of the country, generally experience less deprivation than women in other regions. As can be seen in the results, the gap between rural and urban areas still has a determining effect on the country. Therefore, public policies to increase women's empowerment should be primarily directed towards rural areas and should focus on closing this rural-urban gap. This should be followed by policies aimed at identifying and addressing the factors that lead to higher levels of female deprivation in other parts of the country other than the capital region.

In conclusion, the indicators with the highest inadequacies in terms of the women's empowerment index for Rwanda are access to electricity, education, access to water, physical and/or emotional violence, and employment. Having lack of access to basic services such as electricity and water, being subject to physical and/or emotional abuse of their husbands or partners, and experiencing inequalities and disadvantages in terms of education and employment opportunities prove to be disempowering factors in Rwanda. These problems require the cooperation of national and local authorities. Even though the women's status has improved after the civil war and the gender gap in the country is gradually decreasing, individual inadequacies of Rwandan women persist according to the results of this study's empowerment analysis. Obviously, Rwanda made significant progress towards gender equality especially in politics with a female majority in the parliament, however, the deprivations that most of the women still experience prove that necessary legislative and administrative actions are needed. The women politicians can be the voice of Rwandan women who cannot speak for themselves.

This study does not require ethics committee approval.

The authors declare that the study was conducted in accordance with research and publication ethics.

The authors confirm that no part of the study was generated, either wholly or in part, using Artificial Intelligence (AI) tools.

The authors declare that there are no financial conflicts of interest involving any institution, organization, or individual associated with this article. Additionally, there are no conflicts of interest among the authors.

The authors declare that they contributed equally to all processes of the research.

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APPENDIX

App. 1. Descriptive Statistics of the Indicators

Indicators	Percent
INDIVIDUAL FACILITIES	
Education in single years	
0-4	35.3
5-9	48.9
10-14	12.7
15+	3.1
Respondent worked in last 12 months	
No	26.7
In the past year	7.00
Currently working	64.2
Have a job, but on leave last 7 days	2.1
Time to get to water source	
0-30 min.	44.0
31+ min.	34.5
On premises	19.7
Not a de jure resident	1.8
Don't know	.04
Household has: Electricity	
No	50.2
Yes	48.0
Not a de jure resident	1.8
DECISION-MAKING	
Person who usually decides on: Large household purchases	
Respondent alone	8.3
Respondent and husband/partner	69.7
Husband/partner alone	21.9
Someone else	0.1
Other	.05
Person who usually decides how to spend respondent's earnings	
Respondent alone	23.3
Respondent and husband/partner	67.4
Husband/partner alone	9.3
Someone else	.02
Current pregnancy wanted	
Then	57.4
Later	30.3
Not at all	12.3
Person who usually decides on: Respondent's health care	
Respondent alone	29.4
Respondent and husband/partner	52.9
Husband/partner alone	17.5
Someone else	0.2
Other	0.04
VIOLENCE	
Experienced any less or severe violence by husband/partner	
No	63.5
Yes	36.5
Experienced any emotional violence by husband/partner	
No	65.3
Yes	34.7
Experienced any sexual violence by husband/partner	
No	84.6
Yes	15.4
Husband/partner tries to limit respondent's contact with family	
No	91.5
Yes	8.5

Source: Authors construction based on the Rwanda DHS 2019-2020 (NISR, MOH, & ICF, 2021).