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Women's Empowerment in Rwandan Agriculture

A baseline assessment in the context of Rwanda's Gender and Youth Mainstreaming Strategy and the Fourth Strategic Plan for Agricultural Transformation

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ABSTRACT

Rwanda is a recognized leader in the region and in the world in terms of women's empowerment. However, no country has yet achieved full gender equality, resulting in untapped potential. The findings from the Women's Empowerment in Agriculture Index (WEAI) baseline survey conducted in 2019 for the Ministry of Agriculture and Animal Resources (MINAGRI), indicated that women and men in Rwanda both have relatively high levels of empowerment across different agricultural domains, and most women are as empowered as men in their households. This working paper discusses the findings further and in the context of MINAGRI's Gender and Youth Mainstreaming Strategy that was also launched in 2019, as well as the Fourth Strategic Plan for Agricultural Transformation (PSTA 4). Key findings include the following.

- Compared to other countries in the region, women in Rwanda have relatively greater access to financial services and a relatively lower time burden in agriculture.
- However, when compared to men in Rwanda, inequalities persist. Women are significantly less likely than men to access financial services, participate in the marketing of agricultural commodities, access extension services, and spend their time on productive (rather than reproductive) work.

By adapting and promoting innovative and gender-inclusive financial products, shifting gendered cultural norms, providing extension to both the household head and the spouse, and investing in time-saving technologies and innovations, there are opportunities to reduce the gender gap in agriculture and increase agricultural productivity. Realization of these outcomes will depend partly on the implementation of the Gender and Youth Mainstreaming Strategy and PSTA 4, and partly on coordination with other gender-transformative programs in Rwanda.

INTRODUCTION

Women's participation in agricultural production, agricultural value chains, and food systems varies from country to country. Despite this, it is widely recognized that the empowerment of women in all aspects of agriculture—from decision-making on what to cultivate to how to market farm production to having control over income from these activities—can contribute to higher productivity and higher income, with the potential for further contribution to higher-order outcomes such as the health and welfare of entire households and communities (Alkire et al. 2013). Closing the gender gap in access to agricultural inputs alone could lift 100–150 million people out of hunger (FAO 2011). The active participation of women in the main farm-household activities and decision-making has been shown to improve the allocation of scarce resources and equitable distribution of household production income (De Brauw et al. 2014; Fiala and He 2016; Croppenstedt et al. 2013), while the effective inclusion of women in the choice of crops to cultivate can result in healthier diet outcomes (Gilligan et al. 2020; Duflo and Udry 2004).

Rwanda's National Transformation Strategy (NST 1) recognizes that gender equality is a cornerstone of the country's social and economic transformation, especially if accompanied by a recognition of the intrinsic value of women's empowerment in all social, economic, and political spaces. Recognizing the importance of women's empowerment in agriculture, the Rwanda Ministry of Agriculture and Animal Resources (MINAGRI) launched the Gender and Youth Mainstreaming Strategy (GYMS) in 2019 with the goal of "ensuring that women and men and youth benefit equally from policy action, programs, and activities, and that inequality is not perpetuated" (MINAGRI 2019) in the implementation of the Fourth Strategic Plan for Agricultural Transformation (PSTA 4) and the National Agriculture Policy (NAP).

The GYMS identifies five action areas where inequalities between men and women in Rwanda are still significant and uses these action areas to define the focus for gender mainstreaming under the GYMS. They are (1) addressing the low levels of financial inclusion among women and youth; (2) increasing the low participation in lucrative parts of agri-value chains; (3) increasing access to extension support, inputs, and technology; (4) strengthening institutional capacity for gender-responsive development of the agriculture sector; and (5) increasing control over resources and decision-making.[1]

In 2019, MINAGRI and the U.K. Department for International Development (now the Foreign, Commonwealth, and Development Office (FCDO)) commissioned IMC Worldwide to conduct a nationally representative baseline survey on women's empowerment in agriculture for the purposes of monitoring progress under PSTA 4.[2] The survey adapted the Women's Empowerment in Agriculture Index (WEAI) to the Rwandan context. This working paper discusses the findings from the IMC Worldwide (2020) report, explores the underlying WEAI Rwanda data in greater depth, and analyzes findings in the context of PSTA 4 and the GYMS. In doing so, the paper seeks to offer guidance to the mainstreaming of the GYMS in the various interventions, programs, and activities being implemented by MINAGRI, the Rwanda Agricultural and Animal Resources Development Board (RAB), the National Agricultural Export Development Board (NAEB), and their many partner organizations within government, Rwanda's donor community, and the private and civil society sectors.

[1] The GYMS's fourth domain on "strengthening institutional capacity" is not discussed in this brief because the WEAI does not collect data or information on gender-transformative governance, institutional capacity, or policymaking.

[2] IMC Worldwide's report and data from the 2019 WEAI Baseline Survey (IMC Worldwide 2020) were made available to IFPRI for the preparation of this brief and for other analytical purposes in support of MINAGRI and its partners.

WOMEN'S EMPOWERMENT IN AGRICULTURE INDEX (WEAI)

The WEAI is a survey-based index that was launched in February 2012 by IFPRI, the Oxford Poverty, Human Development Initiative (OPHI), and Feed the Future, the U.S. Government's global hunger and food security initiative. The WEAI measures the empowerment, agency, and inclusion of women in the agricultural sector, and uses two indices in its measurement: the Five Domains of Empowerment Index (5DE) and the Gender Parity Index (GPI). The overall WEAI score is a weighted average of these two indices, with the 5DE accounting for 90 percent of the WEAI score and the GPI accounting for 10 percent (Alkire et al. 2013).

The 5DE considers women's levels of empowerment in agriculture across five key domains: (1) production (input in agricultural productive decisions); (2) resources (ownership of assets; purchase, sale, or transfer of assets; and access to and decisions on credit); (3) income (control over use of income); (4) leadership (group membership and public speaking); and 5) time (workload). The 5DE reflects how many women in a sampled population of interest are empowered and, among women who are not yet empowered, how close they are to becoming empowered. Empowerment is measured in terms of 10 binary (1/0) indicators related to the five domains. The weighted average of these indicators is known as the "empowerment score," and a woman is identified as "empowered" if she has an empowerment score of 80 percent or higher, roughly equivalent to achieving adequacy in at least 8 out of 10 indicators. The 5DE can be improved by increasing the share of women who are empowered or, for those women who are not yet empowered, by increasing their empowerment scores, i.e., the share of indicators in which they achieve adequacy.

The GPI is an inequality measure that compares the empowerment scores of women and men in the same household. The GPI reflects how many women in the sample experience "gender parity" in their household and, among households that have not yet achieved gender parity, how close they are to achieving it. Gender parity is achieved if either of the following conditions are true: the woman is empowered, or her empowerment score is equal to or greater than that of the male respondent in the same household. The GPI can be improved by increasing the share of women who experience gender parity or, for those women who do not experience gender parity, by reducing the empowerment gap between women and men in the same households.

Data for the WEAI were collected using survey instruments that can be applied to a variety of contexts based on the research question, project scope, or study objectives. For the IMC Worldwide study conducted in Rwanda, the WEAI study was implemented with a nationally representative baseline survey (n=5,936 households) that allowed for the calculation of the WEAI, 5DE and GPI scores for Rwanda (IMC Worldwide 2020). See annex for additional details on the sampling frame.

Several modifications and adaptations were made to the standard WEAI survey instrument to adapt it to the Rwandan context that deviate from the original WEAI design. For example, the 2019 survey sample includes urban households in the three districts of Kigali in order to capture urban and peri-urban agricultural activities and to provide comparison points for rural agriculture, despite the fact that the original WEAI was not designed for such comparisons. Nonetheless, the 2019 survey provides a sufficiently representative sample and a comprehensive set of data points to make the resulting WEAI calculations sufficiently useful in baselining women's empowerment and gender parity in Rwandan agriculture.

WOMEN IN AGRICULTURE AND AGRICULTURAL POLICY IN RWANDA

The 2019 WEAI baseline survey finds encouraging results for rural Rwandan households, with an overall WEAI score of 0.91, comprising a 5DE score of 0.91 and a GPI score of 0.96.[3] However, these composite index scores mask certain findings related to disempowerment and inequalities that bear closer examination. Despite these high index scores, 28 percent of rural women still did not meet the threshold for "empowerment", while 24 percent of women were not as empowered as the primary adult male in their household. Among the five domains discussed above, women were the least empowered in terms of workload, with 21 percent not reaching the empowerment threshold for this indicator. In terms of gender parity, the greatest inequality between men's and women's scores were in the resources domain, most notably, in the sub-domain of asset ownership (IMC Worldwide 2020).

Still, these results also suggest a much higher level of empowerment among women in agriculture in Rwanda compared to many other countries. For instance, in areas surveyed in Malawi and Uganda in 2012, 48 and 42 percent of women were not empowered, respectively (Malapit et al. 2014).

These results also align with findings from prior efforts to collect WEAI data in Rwanda. The most significant effort was a 2013 baseline survey (n=2,000) conducted in all 27 rural districts of Rwanda for Feed the Future (Westat 2013; FTF FEEDBACK 2016). However, the exact survey instrument used, and the population sampled in the Westat (2013) survey are not necessarily comparable to the IMC Worldwide sample that is explored in this paper and may be affected by sample selection biases (IMC Worldwide 2020).[4] Another effort to collect WEAI data was undertaken in 2017 by ActionAid (2017), using an abridged WEAI survey and additional instruments specific to the ActionAid project. However, the sample (n=975) was not representative at a level that can be compared to the subsequent IMC Worldwide survey. Thus, for the reasons noted above, we do not draw comparisons between the two datasets. However, we acknowledge that the earlier results and cross-country comparisons (Table 1) can provide a notional indication of progress in Rwanda's efforts to understand and promote women's empowerment and gender equality.

[3] These main results cited from the IMC Worldwide report were calculated only for rural households. The subsequent findings in this report on the individual WEAI indicators as they relate to the GYMS are calculated from the entire WEAI 2019 sample (that is, both urban and rural households) because the GYMS targets all Rwandan households.

[4] Results from the survey were compared to other countries in a 13-country synthesis by Malapit et al. (2014). Among the eastern and southern Africa countries covered by Malapit et al. (2014), Rwanda scores the highest in terms of the WEAI, 5DE, and GPI scores, with 70 percent of women adequately empowered and 73 percent having achieved gender parity (Table 1).

Table 1. Prior WEAI scores in eastern and southern Africa

Country	WEAI Score	5DE Score	GPI Score	Women with adequate empowerment (%)	Women with adequate gender parity (%)	Sample	Date of data collection
Rwanda	0.91	0.91	0.96	72	76	All districts except the 3 of Kigali City	2019
Rwanda	0.91	0.90	0.96	70	73	All districts except the 3 of Kigali City*	2013
Kenya	0.72	0.71	0.81	32	36	Semi-arid and northern arid lands*	2013
Malawi	0.84	0.83	0.91	52	53	Central and Southern Regions*	2012
Uganda	0.86	0.85	0.92	58	61	Prioritized by welfare indicators*	2012
Zambia	0.80	0.79	0.89	40	46	Eastern Province*	2012

Source: IMC Worldwide 2020; Malapit et al. 2014; Westat 2013; FTF FEEDBACK 2016.
Note: * Sample was drawn from the Feed the Future zones of influence set forth by the U.S. Agency for International Development. All WEAI surveys synthesized in Malapit et al. (2014) were associated with USAID programming. Note that differences in sampling frames, survey instruments, and concerns about sampling bias make the Rwanda scores non-comparable for analytical purposes here.

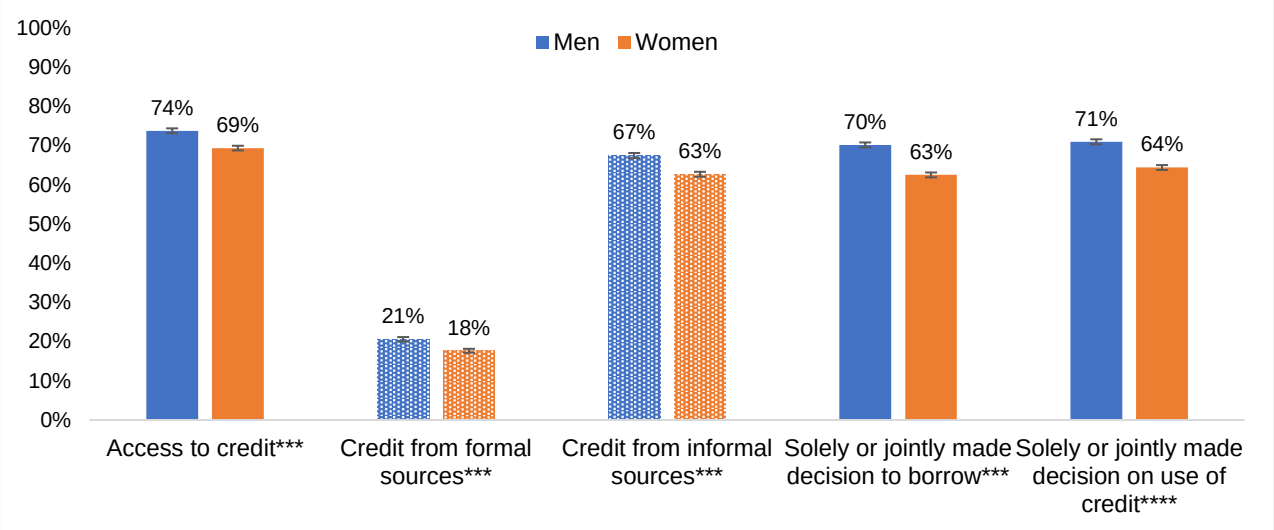
Financial services

First, we examine the WEAI data in the context of the GYMS's aim of addressing the low levels of financial inclusion among women in Rwanda. The goal of this GYMS action area is to ensure that women are included and provided equal access to any agricultural finance programs, including but not limited to agricultural insurance, savings and credit cooperative societies (SACCOs), microfinance institutions (MFIs), and other savings and credit services. Access to credit can create economic opportunities for women by enabling them to build their financial capabilities, savings, and investment potential, leading to opportunities for income-generating activities, risk management strategies, and sustained improvements in livelihoods (Ongena and Popov 2016). Moreover, there is evidence indicating that, on average, women are less risky borrowers than men. Women are more likely to repay their loans and use the money in ways that advance the wellbeing of their household, such that improvements in women's financial access have substantial benefits beyond the individual (D'Espallier et al. 2011; ILO 2008).

In rural Rwanda, a large share of women can access credit, with nearly 70 percent of WEAI survey respondents reporting that they have access either to formal or informal credit (**Error! Reference source not found.**). Findings from other countries in the region generally show similar or lower rates of access to credit for women. For example, 70 percent of women in Tanzania have access to credit, while 4 and 24 percent of women in Uganda utilize formal and informal credit, respectively (FSDU 2018; FinScope Tanzania 2017). Despite Rwanda's progress compared to other countries in the region, several studies indicate that the country still faces challenges in this area. For example, women's lower level of income and education, beliefs that undermine women, limited collateral, limited access to resources and information, limited entrepreneurial and innovation skills, and women's household and employment status have been identified as key factors that contribute to women's financial exclusion in the country (Pro-Femmes/Twese Hamwe 2018; GMO 2017; MIGEPROF 2016; Aterido, Beck, and Iacovone 2013).

In the 2019 WEAI survey, the most common challenge that women cited is not having collateral (reported by 40 percent of women), followed by high interest rates (reported by 25 percent of women). Despite the relatively high rate of credit access for women in Rwanda, the WEAI survey data indicate that men have greater access to both formal and informal credit and are more likely to make decisions regarding the use of credit than women (**Error! Reference source not found.**). And so, while women are relatively empowered in this domain when compared to women in other East African countries, they are still not as empowered as men in Rwanda.

Figure 1. Access to financial services, by gender



Source: Author's calculations using data from the 2019 WEAI Baseline Survey.
Note: Asterisks (*), (**), (***) indicate a statistically significant difference between men and women at p≤0.1, p≤0.05, and p≤0.01 respectively. Dotted bars indicate that this indicator is a disaggregation of the "Access to credit" indicator. Error bars indicate standard errors. The phrase "solely or jointly" refers to the decision being made by the individual (either the woman or man respondent) either independently or jointly with their spouse.

Markets and value chain representation

We also examine the WEAI data related to women's representation and participation in value chain activities. The GYMS market and value chain action area is directly linked to the PSTA 4 priority area that aims to ensure that agricultural value chains are inclusive and responsive to the needs of women and young people by improving market linkages, participation, and entrepreneurial capabilities for women and youth along the value chain. To provide a sense of the potential impact of more inclusive value chains, the Food and Agriculture Organization of the United Nations (FAO) *State of Food and Agriculture Report 2010-2011* (SOFA) suggests that if women had the same access to productive resources including land, financial services, education, and technology along agricultural values chain as men, they could increase on-farm yields by 20-30 percent and raise total agricultural output in developing countries by 2.5-4.0 percent (FAO 2011).

In fact, women account for 43 percent of the agricultural labor force in developing countries, and almost 50 percent in sub-Saharan Africa, despite having less access to productive resources such as inputs and financial services (FAO 2011). In some countries, for example Malawi and Burkina Faso, more than 90 percent of economically active women are involved in agricultural value chains. These women work primarily in smallholder production and traditional food markets where input use, capital requirements, and profit margins are relatively low. In many countries, most commercial production and processing enterprises are owned by men, while women tend to be more predominant in small-scale processing activities, which may explain the low income and low participation of women in profitable activities within value chains (Twin Report 2013).

As a result, women often receive a significantly lower share of income and are less likely to control income generated from the sale of agricultural production in comparison to men in the same sub-sector (AfDB 2015; Barrientos 2014; Lanjouw 2001). For example, women in Nigeria account for 25 percent of cassava farmers but earn just 17 percent of the income, while women in Ethiopia make up 75 percent of the workforce in the country's coffee industry, they control only 43 percent of the revenue (AfDB 2015).

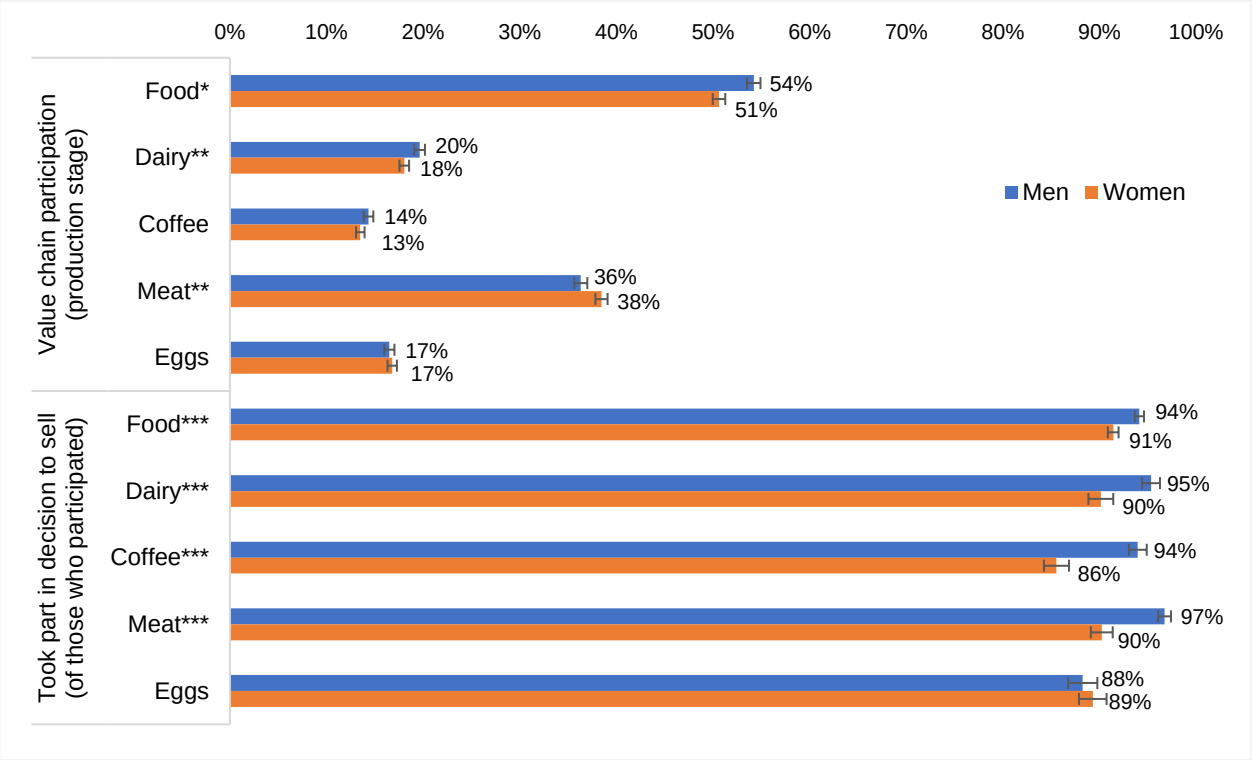
The WEAI survey data indicate much of the same story for Rwanda, with some variation across commodity value chains. The survey collected data on five specific value chains: food crops, dairy, coffee, meat, and eggs. The food crops value chain includes maize, cassava, rice, wheat, Irish potatoes, sweet potatoes, cooking bananas, fruit, and vegetables, while the meat value chain is defined as producing animals for meat/slaughter. The survey asked respondents about their involvement in the different stages of the value chain, including production, packaging and labelling, sales, and transportation of products.

Findings indicate that women's participation differs from men depending on the value chain, with considerable variation in their relative control over the income from the value chain. For example, in the coffee value chain, men and women have similar levels of participation (around 13-14 percent of all individuals surveyed), although men are more likely than women to make decisions regarding the sales of the coffee (97 percent of men compared to 86 percent of women) (Figure 2).

Interestingly, in the meat value chain, women are more likely to participate in production than men (e.g., when and how to raise livestock and animal resources), but much less likely to make any decisions about selling meat by-products (.e.g, when, where, or at what price to sell them). In other value chains—dairy and certain food value chains—men are more likely than women to participate and to make marketing decisions. In the egg value chain, both women and men participate contribute to decisions at similar levels. Overall, the findings suggest that, with the exception of participation in the meat value chain (although not in the decision making for meat), men participate and make decisions at the same level or more than women in all value chains.

These challenges suggest the need for more innovative approaches to encourage participation of women in value chains, such as bringing together networks of different value chain players to facilitate dialogue, identify barriers and constraints, and create opportunities for women in production, marketing, and public policy (Quisumbing 2021; Njingulula et al. 2020; Malapit et al. 2020).

Figure 2. Value chain participation and marketing decisions, by gender



Source: Author's calculations using data from the 2019 WEAI Baseline Survey.
Note: Asterisks (*), (**), (***) indicate a statistically significant difference between men and women at p≤0.1, p≤0.05, and p≤0.01 respectively. Error bars indicate standard errors. The meat value chain refers to producing, processing and selling of livestock and animal resources for meat/slaughter. The dairy value chain refers to producing, processing, and selling milk and dairy products. The food value chain refers to producing, processing, and selling of other food items such as crops.

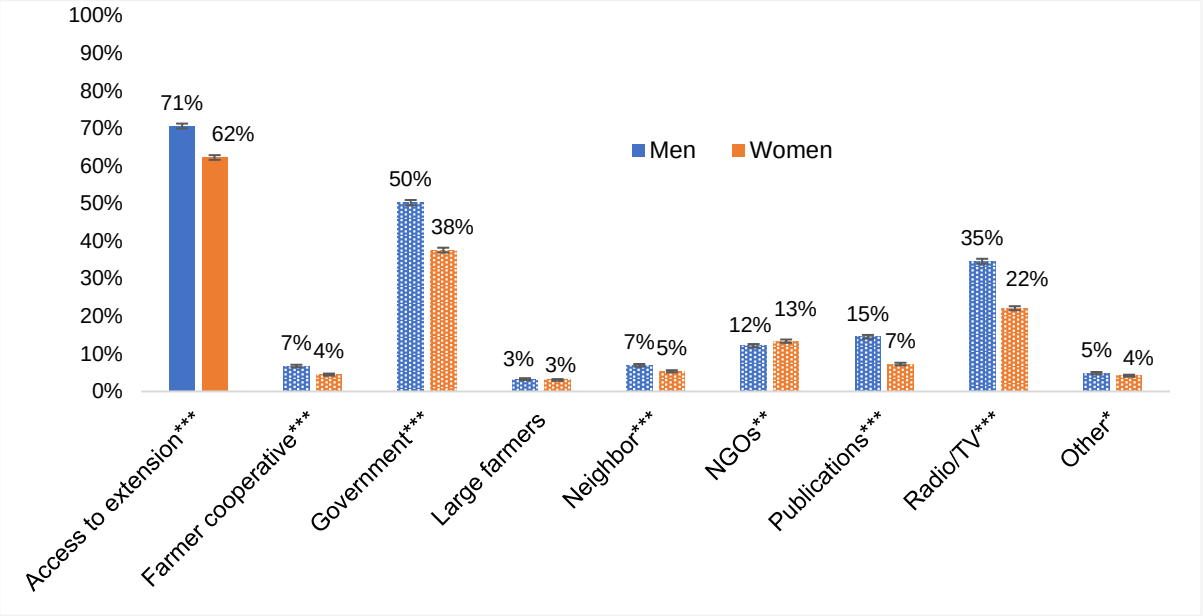
Extension support, inputs, and technology

We also examine the WEAI data on access to extension support, inputs, and technology in agriculture. Both the GYMS and PSTA 4 recognize that access to extension services, information, inputs, and technology are critically important to increasing and intensifying agricultural production in Rwanda, and that there is a need to improve access for women. The GYMS explicitly includes reference to extension support as a key target in order to improve access to inputs and information, with the broader goal of increasing productivity and developing business and marketing skills among all farm-household members.

Regarding extension in Africa, women account for less than 10 percent of those receiving agricultural extension services, with significant consequences for on-farm productivity (AfDB 2015; Doss et al. 2011; Chan and Barrientos 2010). Meanwhile, only 15 percent of the world's agricultural extension agents are women (FAO 1993, 2011). Sheahan and Barrett (2017) find that in six countries in sub-Saharan Africa (not including Rwanda) female-headed households are less likely to use modern inputs compared to male-headed households. Their results, drawn from an analysis of data from the Living Standards Measurement Study—Integrated Surveys on Agriculture (LSMS-ISA), also reveal that women earn lower returns from using those inputs than men. Cultural norms, market failures, and institutional constraints are identified as some of the main contributors to the lower rates of access and returns for women. And while efforts to address biases in cultural norms may be difficult to implement, they are not unheard of. For example, in a field experiment conducted in Uganda, Lecoutere et al. (2023) find some support for the idea that featuring female role models in the extension videos can challenge men's beliefs and stereotypes about women's roles in agriculture and encourages the adoption of recommended practices by women, although stronger effects are found by targeting information to female co-heads within a household.

The WEAI demonstrates gender differences in access to agricultural information and extension services in Rwanda. Findings indicate that 71 percent of men and 62 percent of women accessed information and extension services during the 12 months prior to the survey (Figure 3). While the most common sources of information and extension were similar for men and women—government extension services, radio and/or TV, and publications (e.g., newspapers, pamphlets, and other reading materials)—women were more likely than men to access these services from non-governmental organizations (NGOs). This suggests that NGOs may target women more actively than men, filling a gap left by gender biases in public extension and information provision.

Figure 3. Access and source of extension services, by gender



Source: Author's calculations using data from the 2019 WEAI Baseline Survey.
Note: Asterisks (*), (**), (***) indicate a statistically significant difference between men and women at p≤0.1, p≤0.05, and p≤0.01 respectively. Dotted bars indicate that this indicator is a disaggregation of the "Access to extension" indicator. Error bars indicate standard errors.

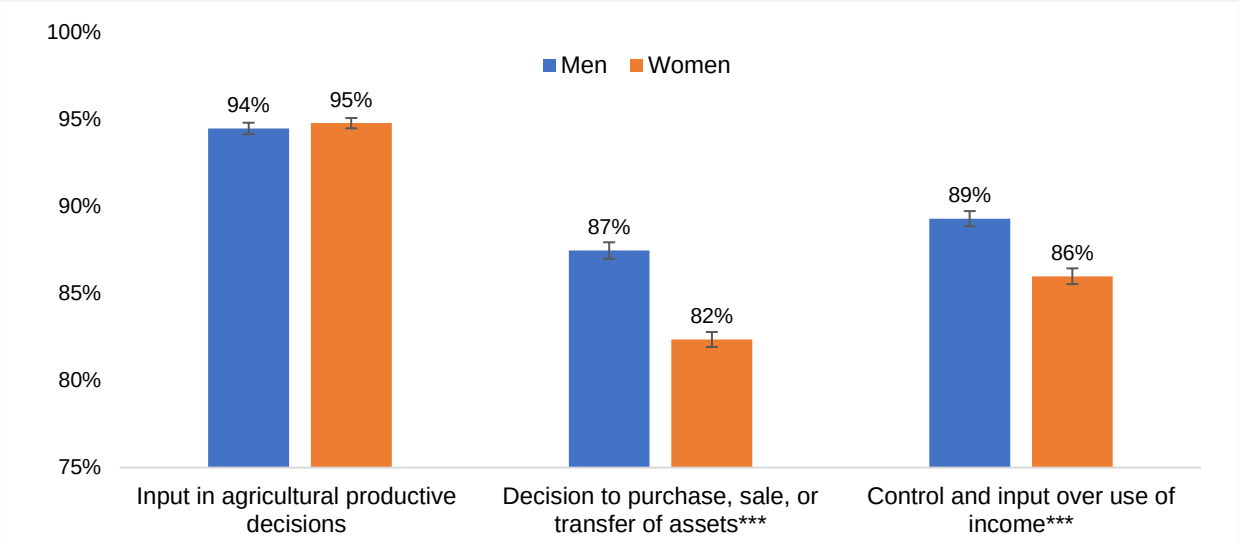
Empowerment and decision-making

Finally, we examine the WEAI data on empowerment and decision-making. Both the PSTA 4 and GYMS recognize that gender equality is important for reasons well beyond growth targets on-farm productivity and value chain participation—the intrinsic value of women's empowerment in all social, economic, and political spaces is a cornerstone of Rwanda's overarching national transformation strategy. The GYMS aims to promote women's empowerment by enhancing women's decision-making power over productive activities and assets, and by reducing the burden and drudgery of women's household labor, thereby creating opportunities for women to participate in other productive activities.

The WEAI data indicate that both men and women have high levels of input into agricultural production decisions relating to food and cash crop farming, fisheries, and livestock (**Error! Reference source not found.**). However, men were slightly more likely to make decisions on whether to purchase, sell, or transfer agricultural assets, namely agricultural land, livestock, fishponds, and farm equipment.

A further disaggregation of the data reveals differences in the types of assets over which women and men tended to make decisions. For example, women's decision-making is usually restricted to minor assets such as small stock (for example, chickens) or non-mechanized farming equipment while men tended to make more decisions about major assets such as larger livestock and agricultural land.

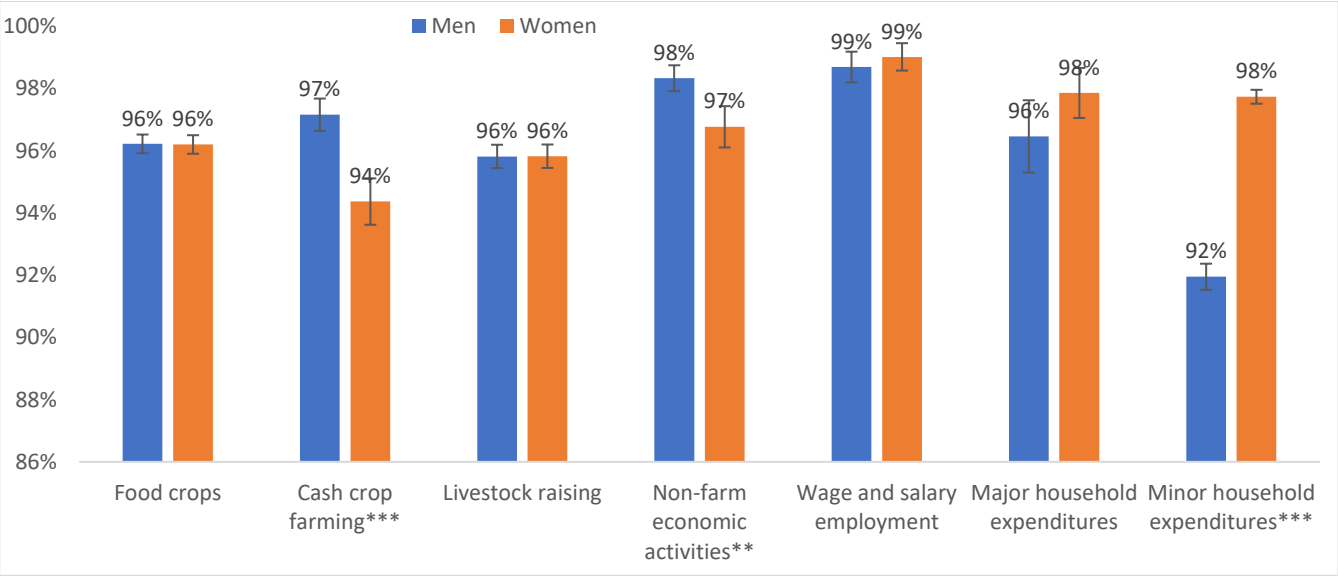
Figure 4. Decision-making in agricultural activities, assets, and income, by gender



Source: Author's calculations using data from the 2019 WEAI Baseline Survey.
Note: Asterisks (*), (**), (***) indicate a statistically significant difference between men and women at p≤0.1, p≤0.05, and p≤0.01 respectively. Error bars indicate standard errors.

Gender differences also exist in terms of expenditure decisions (Figure 5). Men were more likely than women to make decisions about household expenditures from income generated from economic activities—including income from food and cash crop farming, livestock raising, and non-farm activities—while women's input on household expenditures was limited to minor items such as food, clothing, and small household appliances.

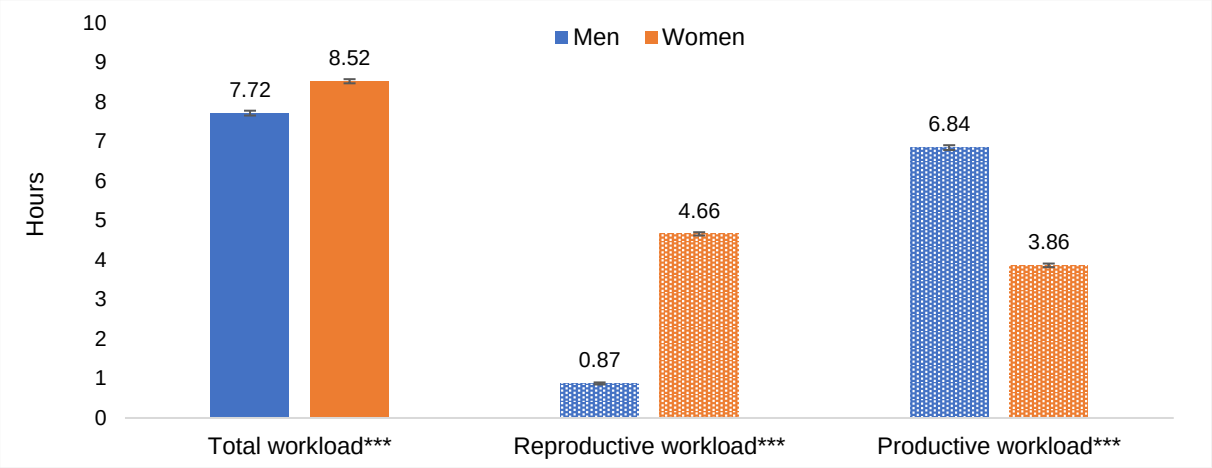
Figure 5. Decision-making in household expenditures, by gender



Source: Author's calculations using data from the 2019 WEAI Baseline Survey.
Note: Asterisks (*), (**), (***) indicate a statistically significant difference between men and women at p≤0.1, p≤0.05, and p≤0.01 respectively. Error bars indicate standard errors.

Additionally, and consistent with studies from other countries, the WEAI data suggest that women in Rwanda carry a much greater workload than men. On average, women in Rwanda work 8.5 hours per day, compared to only 7.7 hours for men, while 38 percent of women have a workload greater than 10.5 hours per day, compared to only 32 percent of men (**Error! Reference source not found.**). However, when compared to Quisumbing et al.'s (2021) findings, these findings suggest that women in Rwanda work fewer hours on average than women in certain regions of Ghana (10.4 hours) and Tanzania (9.4 hours).

Figure 6. Workload types, by gender

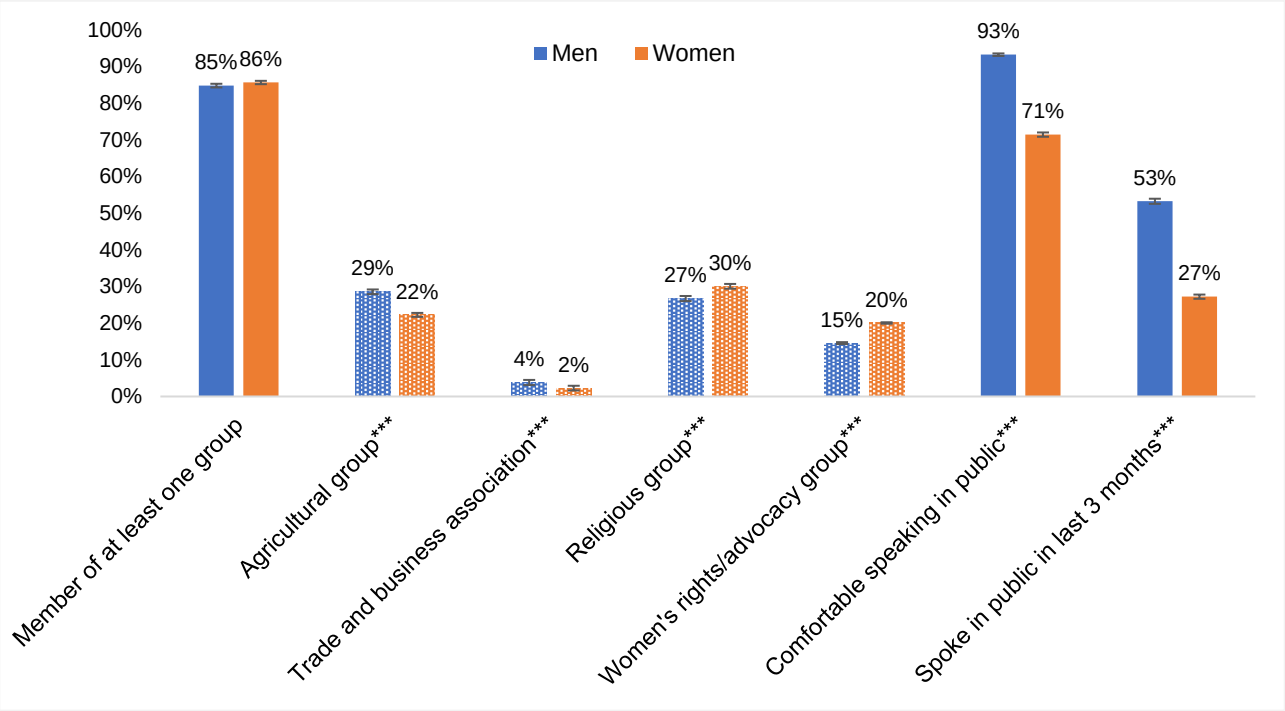


Source: Author's calculations using data from the 2019 WEAI Baseline Survey.
Note: Asterisks (*), (**), (***) indicate a statistically significant difference between men and women at p≤0.1, p≤0.05, and p≤0.01 respectively. Dotted bars indicate that this indicator is a disaggregation of the 'total workload' indicator. Error bars indicate standard errors.

In addition to these differences in total workload, the distribution of workload is different between men and women in Rwanda. Women spend more than four times as many hours than men on activities that do not directly generate incomes for the household but are nonetheless important to household welfare. Notably, women spend more time on reproductive work which is defined as caring for others (including children, adults, or elderly), domestic work, cooking, fetching water or firewood, socializing, cultural activities, hobbies, and shopping for goods or services (including healthcare). Men, on the other hand, spend more time on productive work which includes working in wage employment, owning or working in a household business, farming, rearing livestock, weaving, sewing, textile care, travelling, and commuting. This is consistent with the United Nations Department of Economic and Social Affairs (UNDESA) 2020 World's Women report that revealed that women spend about three times as many hours in unpaid domestic work and care work as men, on an average day.

Finally, the WEAI data also provides information on women's empowerment within the community. In terms of women's participation in agricultural and other groups, gender differences emerge depending on the type of group. Women are more likely to be a member of a religious group or a women's rights/advocacy group, while men were more likely to serve as active members of agricultural groups or trade and business associations (Figure 7). Women are also less comfortable and less likely to speak in public as compared to men, with 71 and 27 percent of women feeling comfortable and having spoken in public in the last three months, respectively, compared to 93 and 53 percent of men.

Figure 7. Community involvement, by gender



Source: Author's calculations using data from the 2019 WEAI Baseline Survey.
Note: Asterisks (*), (**), (***) indicate a statistically significant difference between men and women at p≤0.1, p≤0.05, and p≤0.01 respectively. Dotted bars indicate that this indicator is a disaggregation of the "member of at least one organization" indicator. Error bars indicate standard errors.

DISCUSSION

Women make significant contributions to the rural economy in Rwanda and in countries around the world. Their roles, levels of empowerment, and parity with men differ among countries, although patterns of inequality, whereby women are less empowered than men, are common. Rwanda stands out as one of the few countries in sub-Saharan Africa where women have relatively comparable access to the resources and opportunities they need to be productive in agriculture, and thus stand to contribute more actively to the country's agricultural and wider social and economic transformation. However, in several areas that are key to the GYMS and PSTA 4, women in Rwanda still struggle relative to men. These areas include: access to financial services; participation in value chains; and access to agricultural information, extension, inputs, and technology. Moreover, women still face challenges related to voice and agency, as indicated by their unequal role in multiple aspects of decision-making, burden of work, control over assets, and contributions to key community activities.

Many of these challenges are already recognized and articulated in PSTA 4 and in the GYMS's priority intervention areas. However, the measurement of their prevalence at baseline (2019) using the WEAI suggests that continued measurement can provide a sense of whether progress is being achieved, for example, at the endpoint of PSTA 4 and beginning of PSTA 5 in 2024. Their measurement also reminds us of several intervention areas that may need greater attention.

The first area of intervention is to improve women's access to credit and financial services, which could be accomplished by working with financial institutions to reduce collateral requirements, subsidize lending rates, or expand access to lending products tailored to women and women's organizations. There are ongoing discussions on these types of interventions, but continued progress is needed on product rollouts, rigorous evaluations, and scale-up efforts.

Second is to the promotion of women's participation in agricultural value chains. This could include, among other interventions, efforts to shift women's time, effort, skills, and resources from less profitable (and usually also more female-oriented) value chains such as staple food crops to more profitable (and usually more male-oriented) value chains such as animal products and cash crops. Interventions in this area would likely require not only financial service provision and business skills development for women entrepreneurs, but also efforts to address social and cultural norms that otherwise inhibit their entry into the market.

Third is the inclusion of women in extension services, both as recipients and providers. Ensuring that agricultural extension is delivered to both the (typically male) household head and the (typically female) spouse will increase equality in this domain and potentially increase women's access to and productivity of inputs and technology, thereby increasing their productivity in on-farm activities. Our findings echo similar reports on the importance of engaging women in extension, as highlighted in a recent study on women and youth in extension provision (DLEC 2018).

Fourth is to reduce and redistribute the workloads of women. This recommendation can be partly addressed through the changing—and challenging—of gender norms to encourage men to take on more reproductive/care-oriented work to provide women with opportunity to participate equally in in productive work/workforce. There are examples of programs and projects where this has been successful (see, e.g., Jansen et al. (2022) and Van der Gaag et al. (2019)), and where there are opportunities for adaptation to the Rwandan context. Additionally, the promotion of labor and time-saving agricultural technologies and practices could alleviate part of women's time burden, as could improvements in access to financial and extension services that assist women's shift into higher-return activities.

These ideas and interventions are not new. The need for creative solutions across a wide array of women's empowerment and equality issues is both recognized and understood in Rwanda's policy landscape. The bigger question is how to achieve these goals, or how to move from strategy and policy design to implementation. A first step toward addressing this issue may be to strengthen the gender coordination mechanisms currently in place to ensure effective implementation across multiple governmental and non-governmental actors in the sector. This could shape everything from village-level training—by ensuring that all training events, farmer field visits, and information campaigns on new inputs and technologies are gender inclusive—to higher-level planning among multiple ministries, agencies, and development partners.

Another step may be to introduce sex-disaggregated data collection and analysis into the many agricultural surveys conducted by the National Institute of Statistics of Rwanda (NISR) and its partners. Sex-disaggregated data allows for more intensive monitoring and analysis of PSTA 4 and GYMS and allows policymakers to be better informed on progress. It is important to note that in this context, the standalone 2019 WEAI survey did not collect sufficient data outside of the key WEAI domains to effectively evaluate the impact of PSTA 4 and GYMS when and if an endline is conducted in 2024. Many key variables that correlate with or predict women's empowerment and gender equity—variables such as household livelihood strategies and consumption expenditures—are simply not captured in the 2019 survey. Even if an endline is conducted in 2024, the absence of these variables at baseline would make it difficult to causally attribute changes in women's empowerment to PSTA 4 and other interventions that aim to increase women's empowerment in agriculture in Rwanda.

Going forward, it may make more sense to incorporate the WEAI into successive rounds of the Integrated Household Living Conditions Survey (EICV), ideally as part of a detailed module and expanded household sub-sample on agriculture constructed as a panel across successive rounds rather than a repeated cross-section. This approach has precedent in LSMS-ISA mentioned earlier

(see World Bank (2021)). These surveys have been implemented in partnership with national statistics offices in eight Sub-Saharan African countries to provide multi-topic, nationally representative panel household surveys with a strong focus on agriculture. Rwanda may also benefit from efforts to expand the LSMS-ISA approach to reach 50 countries by 2030 under the 50x2030 Initiative to Close the Agricultural Data Gap, with the potential to also include a new Women's Empowerment Metric for National Statistical Systems (WEMNS) as an alternative to the WEAI in these surveys.[5] An EICV-ISA panel survey with a WEAI or WEMNS component would substantially upgrade the quality of agricultural statistics in Rwanda by providing a high-quality, district-representative panel household dataset incorporating information on women's empowerment and gender equity, with opportunities for causal analysis of program impacts.

In summary, while Rwanda continues to serve as a global example of how to reduce persistent gender gaps through gender-transformative policies, there is still room for improvement (World Economic Forum 2022). Realization of PSTA 4's goals and GYMS priority areas require that more attention be given to program implementation, coordination, and evaluation.

[5] Women's Empowerment Metric for National Statistical Systems (WEMNS) is being developed by IFPRI in collaboration with researchers from Emory and the World Bank LSMS team. It is being designed as the empowerment module for the 50 x 2030 Initiative to Close the Agricultural Data Gap. It also has the potential to be adapted more broadly in large multi-topic surveys to help countries track projects on empowerment outcomes. Although WEMNS draws on many lessons from the development of the Women's Empowerment in Agriculture Index (WEAI), WEMNS looks very different from WEAI. Importantly, it is designed to be applicable to a variety of livelihoods (not just agriculture) to be relevant across rural and structural transformation.

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ANNEX

Sampling frame from IMC Worldwide

The IMC Worldwide 2019 baseline study sampling frame is as follows, as reported directly by the IMC Worldwide (2020) report.

> The baseline survey required that a minimum of 2,183 households complete the WEAI questionnaire. A nonresponse rate of 25% was defined, which increased the target sample size to 2,911. The study used a sample size of 5,500 households (agreed at design and inception phase), which allowed for a more than sufficient number of responses to support representative results at the national, regional, and district levels.
>
> The sample selection for the study followed a two-stage cluster random sampling strategy. In the first stage, the team randomly selected 275 villages from the complete list of all 14,817 of Rwanda's villages. These villages served as clusters. Villages were selected from each of Rwanda's 30 districts, with each district allocated a number of villages in proportion to the district's population. Within each village, the team randomly selected 20 households for interview, accounting for a maximum of 40 individual interviews in each village.[6]
>
> The survey collected data from 10,803 respondents living in 5,936 households located in 269 villages in 30 districts. The population for the study was men living in dual-adult (male and female) households, women living in dual-adult households, and women living in female-headed households across Rwanda. A household is defined as a group of people who live together and take food from the same pot. For the WEAI survey, a household member is defined as someone who has lived in the household at least six months, and at least half of the week in each week of those months. For the analysis of the descriptive statistics, female respondents were disaggregated into households where there is at least one adult male (dual adult households), and households with no male adult present (female-only households). Disaggregating female respondents into two household types addresses one of the criticisms of the WEAI, which is that women in female-only households seem more empowered than women who live with another male adult (Alkire et al., 2013). For each male respondent, there is at least one female respondent in the household who was interviewed for the survey. In female-headed households, only a female respondent was interviewed.
>
> Though the study had urban and rural respondents, WEAI scores are calculated for only rural households. Data for urban households are provided in the full study to allow comparison between rural and urban farming households. This restriction is in place to account for the low levels of agricultural production in urban areas.

[6] The study requires that only the head of household be interviewed in female-headed households.

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