



## Synopsis: Rwanda smallholder agricultural commercialization survey: Overview using selective categorical variables.

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Increased commercialization of smallholder farmers is a major emphasis of Rwanda's PSTA4 and will continue with PSTA5, as well as other policy documents related to agriculture. Although PSTA4 sought to increase the profitability of smallholder production, efforts to address accelerating commercialization were limited due to the absence of data and analysis on returns to commercial production systems. Relatively little was known about smallholder agricultural decision-making and the associated costs and returns to production systems among these farmers. This policy note introduces an important research initiative that will explore various aspects of commercialization by Rwandan smallholder farmers and is meant as a general introduction to smallholder commercialization. In subsequent research papers, more detailed studies based on these initial findings will contribute to an improved understanding of agricultural smallholders by providing (1) more nuanced analysis of commercial farmer typologies, (2) estimates of returns to commercial production systems across multiple farmers typologies, and (3) recommendations designed to improve interventions in smallholder commercialization.

This brief provides a summary of the results obtained from the 2022 Smallholder Farmer Commercialization Survey (IFPRI 2024). Designed to be representative at the national and provincial levels, ten households were surveyed in 202 villages resulting in a total of 2,020 interviewed households. The survey covered a wide range of topics including: 1) household demographics; 2) migration, household assets and house conditions, and shocks; 3) household farm characteristics; 4) household expenditures (consumption and non-consumption), and 5) household income sources. The survey instrument was developed using other IFPRI surveys and was referenced to the 2020 AHS and the 2016-2017 EICV5 surveys from NISR.

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<sup>1</sup> This brief summarizes results from J.Warner, G. Benimana, S. Mugabo, J.Niyonsingiza, G. Rosenbach, E.Mukangabo, B.Dushimayezu, O.Nshimiyimana, C.Ingabire and D.J. Spielman(2023), [Rwanda smallholder agriculture commercialization survey: Overview using selected categorical variables](#), Rwanda SSP Working Paper 8 (Washington, DC: IFPRI).

## Household demographics, housing infrastructure and assets, and shocks and responses.

This report provides a general statistical overview of several aspects of agricultural households in Rwanda and is presented both in aggregated summaries and by several categorical variables of expressed interest. Overall, the survey reveals a great deal of information about the current economic situation and activities for smallholder farmers that can be considered for a variety of purposes, most notably to better inform evidence-based policymaking. To distinguish different profiles of agricultural households from the obtained results, the descriptives provide details provincially, by age<sup>2</sup> and sex of the household head, and by farm size categories. Results indicate that heads of smallholder agriculture households tend to be older (77%), male (70%) and have an average of one more household member than the youth and female-headed households. Yet, these youth and female-headed households have higher dependency ratios, indicating greater economic dependence for these households.

Sixty-six percent of sampled household heads can read, write, and perform simple calculations. Male and youth heads have higher literacy rates. are also positively correlated with farm size. For formal education, approximately 55 percent heads of households in Kigali completed secondary school, 15 percentage points higher than all other regions. Just 32 percent of the female heads completed secondary school education. Both female secondary education as well as overall literacy rates are positively correlated with farm size, suggesting a correlation between income and education.

Approximately, 76 percent of the households drink water from improved sources, 75 percent use improved sanitation facilities, and 60 percent use either electricity or solar energy as source of lighting. Agricultural households in Kigali stood out compared to the rest as the proportion of households with better infrastructure was much higher compared to the rest. Larger farms as well had better infrastructure.

Households were classified into wealth quintiles according to owned assets. Kigali city stood out with 56 percent of the households belonging to the top asset quintile while the Eastern province reported more towards the bottom wealth quintiles. Male-headed households skewed towards the top wealth quintile while female headed households were disproportionately in the bottom. Regarding farmland, wealth increased significantly with increasing farm size.

As farmers rely heavily on the land and weather, they are particularly susceptible to shocks. These shocks affect their livelihoods and can end up significantly reducing crop production and livestock holdings and can have other negative economic impacts on household welfare. From the survey, 58% of all households experienced at least one shock and 30% experienced two, or more, shocks.

### Farm characteristics

Land, understandably, is a critical factor of crop production for smallholder farmers in Rwanda. The average land size from the sampled households was 0.35 ha with a higher average of 0.42 ha in the Eastern province. Female and youth-headed households had the lowest average of land sizes held, 0.25 ha and 0.21 ha, respectively. In terms of distribution, 80 percent of all surveyed households have less than 0.5 ha, with a third having less than 0.1 ha, a third operating on land between 0.1-0.3 ha, and the remaining 30 percent owned land greater than 0.5 ha.

The surveyed farmers had an array of farm management practices, 94 percent used organic fertilizers, 55 percent applied inorganic fertilizer to their fields, and 18 percent used pesticides/fungicides. Use of inorganic fertilizers increased with farm size and by types of crops; while organic fertilizers were found to be used across all crops, inorganic fertilizers and pesticides/fungicides were more commonly used for tomatoes, Irish potatoes, and maize.

Other farm management practices by surveyed households included anti-erosion and irrigation practices. More than half of the households protected their lands against erosion while only 9 percent practiced

irrigation. Irrigation was highest in Kigali City (19%) and lowest in the Western province (4%). Male-headed households were twice as likely to use irrigation than female-headed households.

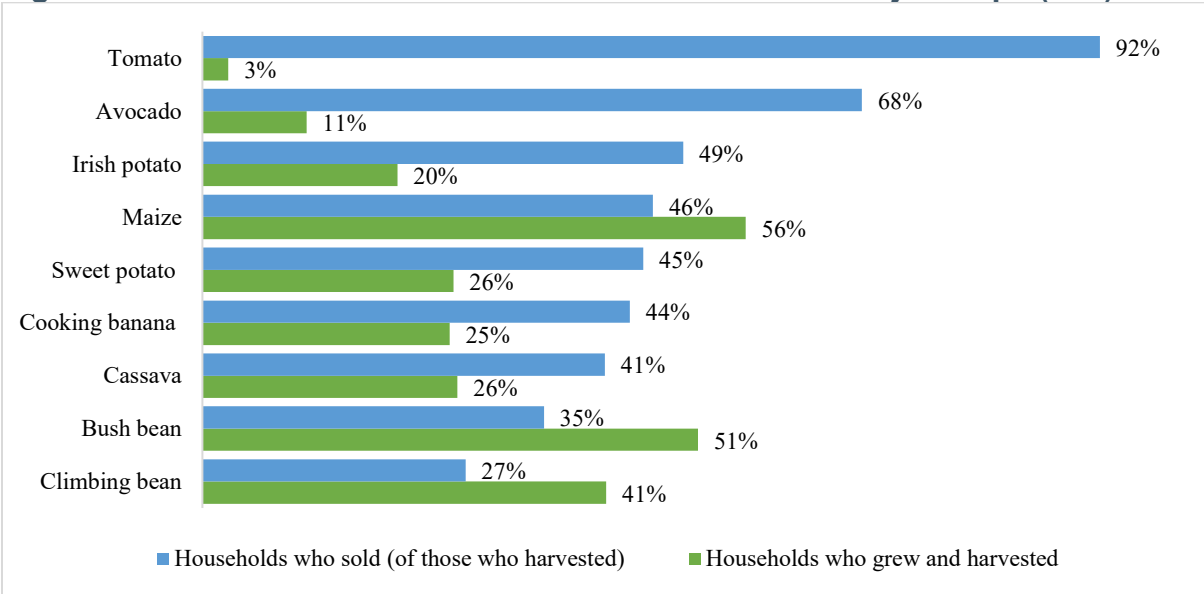
Throughout the 2021-2022 agricultural year, a vast array of extension services were provided from various sources, with the top 3 being media (radio/TV, newspapers), government extension services and FFS/FLP.<sup>3</sup> The accessed extension services were mainly, information on agricultural practices (81%), weather and climate products (42%), access to fertilizer and seeds through SNS<sup>4</sup> (39%), and information on land, soil, and water management (24%). The rest of the agricultural extension services were accessed at rates less than 10% by farmers.

Participation in agricultural programs within the surveyed households is still low. Only eight percent of the households indicated having at least one member part of FFS, only six percent with a member belonging to Twigire Muhinzi-Mworozi (farmer-to-farmer extension) program, and just 13 percent indicated having a household member who was part of a cooperative. For the most part, membership in all these three programs increased with land size.

In the agricultural year 2021-2022, the most common planting practice was monocropping, with at least 90 percent of the respondents using this method. In reference to PSTA 4’s selected commercial and staple food crops, the survey descriptive results conveyed that maize was the crop most grown (57% of all respondents), followed by bush beans and climbing beans (52% and 42% respectively), cassava (34%), cooking banana (29%), sweet potatoes (27%), banana for beer (23%), Irish potatoes (21%), and avocado (20%). Figure 1 depicts both farmer participation in crop production as well as the average amount of individual crop sold.

Focusing on select harvested and marketed crops produced by the surveyed farmers, tomatoes (92%) and avocados (68%) are the crops most likely to be sold but are not commonly produced. Irish potatoes, maize, sweet potatoes, cooking banana, cassava are more commonly grown for household consumption but are less marketed.

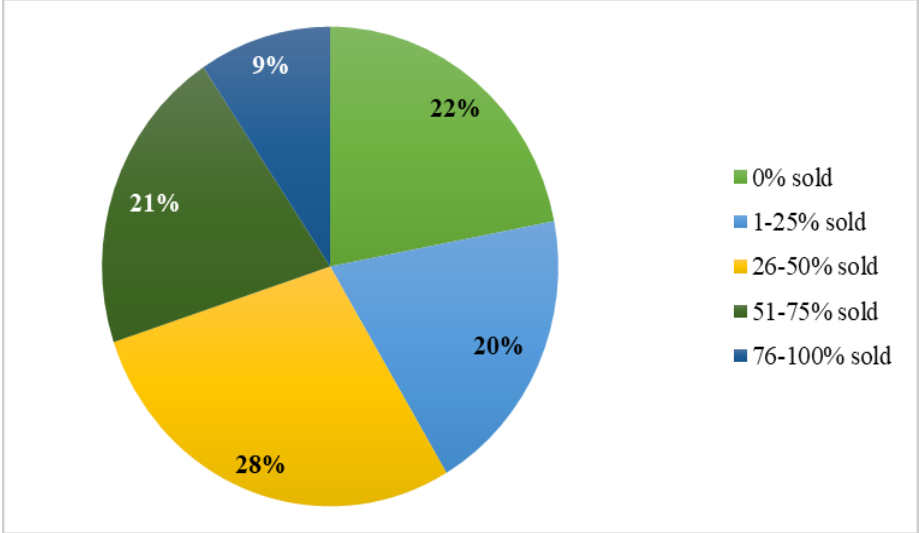
**Figure 1. Households who harvested and sold selected major crops (%’s)**



Authors’ calculation

Figure 2 depicts groups were constructed by average household value of total production sold. The results indicated that 70 percent of households sold less than half of the value of their production and just 9 percent of the households sold more than 75 percent of the value of their production.

**Figure 2. Household percentage of production sold.**



Authors' calculation

As evidenced by the results, households produce crops for various reasons. Determining crop sales from production and sales at the household level and averaging them across all households; cooking banana (75 percent) and sweet potatoes (68 percent) were the highest crops kept for home consumption, whereas tomatoes and avocados were mostly produced for selling, 70 percent and 48 percent respectively.

Considering household production sold across farm size, the 1ha and above farm size category had 66 percent of households selling more than 50 percent of their total production, while 83 percent of the households with less than 0.1 ha sold less than 50 percent of their total production. Most of the selected produced crops are sold on the local market with cooking banana and avocados being sold directly to farmers/consumers.

Approximately 73 percent of households own livestock. Male and mature-headed households on average are more likely to own livestock than their counterparts. Additionally, livestock ownership is positively correlated with farm size, with all land categories reporting a minimum of 60 percent ownership. Aggregating livestock ownership, average ownership was 0.8 tropical livestock units (TLU). Male and mature-headed households had slightly higher quantities of livestock compared to younger or female headed households. Kigali city had approximately 0.5 TLU more than other provinces.

**Wage, employment, Nonfarm Business & Access to Finance**

Members of the smallholder farming households had multiple streams of income, among which were off-farm employment, wages from agriculture and non-agriculture labor activities, and revenues from owned businesses. Within households, the participants in wage employment and owned businesses were mainly heads of households with 61 percent and 51 percent participation rates respectively, while the spouses were just at 20 percent and 36 percent participation, respectively.

Forty seven percent of the surveyed households gained income from farm wage activities, 24 percent from non-farm wage activities, and 11 percent from their non-farm enterprises. Households in Kigali city had the lowest provincial percentage participation in farm wage activities at 28 percent, while the Northern province had the highest percentage at 61 percent. Conversely, Kigali city had the highest percentages of households involved in non-farm wage activities and in non-farm enterprises at 64 percent and 31

percent, respectively. Both these percentages are more than 2.5 times higher than the rest of the provinces, and this suggests the multitude and availability of diverse income-generating opportunities available in peri-urban areas. Comparing the sex of head of household, the percentage of male-headed households obtaining income from non-farm wage activities was double that of female-headed households, while other percentile differences were relatively small. Contrasting to mature-headed households, youth-headed households obtained more income from all three identified activities. Income obtained from farm wage activities increased with smaller land size and, conversely, the percentage of households receiving income from non-farm enterprise increased with larger farm-size.

Among nonfarm business activities, the most popular is wholesale and retail trade with 79 percent engagement.

The reported median monthly wage income (in 2022 RWF) was 15,000 for all surveyed households, this median monthly wage income was higher in Kigali and in the 1 ha and above, landowning households, where both groups had approximately twice the national median income. Most households identified a combination of agricultural sales and wage labor (42%), while 27 percent of the households derived income from only agriculture, and 15 percent obtained their income solely from wage employment. Households with the lowest land derived their income from the combination of sold harvest and wage labor (42%), while households with more land derived their income predominantly from just selling crops (57%).

Eighty-one percent of the surveyed households owned at least one bank account. Notably, female-headed households are lagging when it comes to using bank services as their bank account ownership is 10 percentage points lower than for male-headed households. Umurenge SACCOs are the most utilized financial institutions within smallholder farmers communities, as 64 percent of the households use their services. Cooperative banks, 29 percent, are the second most used institutions across all groups, with Eastern province households, youth-headed households having the lowest percentage. Only five percent of the surveyed households indicated accessing commercial banks' services.

## **Conclusion and Future analysis**

The descriptive results of the smallholder farmer commercialization present a window into the similarities and differences across smallholder farmer households, even when considering the various categorical groupings (i.e., provinces, male, female, mature and youth-headed households, and farm-size categories). This suggests that further analytical work should explore the rationale of continued and increased investment in a range of interventions designed to accelerate farmer welfare. The findings from this research will help inform the prioritization of public policy through several channels.

First, this document provides new household-level evidence that should help policymakers and their advisors make more informed policy choices. This evidence is important in light of questions arising from the Government and its development partners about the rationale for continued or increased investment in a range of interventions designed to accelerate value chain development. Second, this micro-level evidence can also be leveraged by the private sector to improve its own understanding of the commercial investment opportunities in the agriculture sector and the potential returns. Third, findings will provide critical inputs needed to improve the economywide models used to inform budget allocation decisions by MINAGRI and its counterparts. Better data on coverage, costs, and other key parameters for Rwanda will enable continuous improvement of estimated impacts under alternative future scenarios.

Based on these preliminary results, future research, will inform on more nuanced farmer typologies, moving beyond unrealistic subsistence/commercial designations, estimate the returns and drivers of commercial production systems across farmer categories, improve the design and implementation of policies, investments, and programs for smallholder commercialization in Rwanda.

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The Rwanda Strategy Support Program (Rwanda SSP) is managed by the International Food Policy Research Institute (IFPRI). Funding support for Rwanda SSP is provided by the European Union (EU); the United States Agency for International Development (USAID); and CGIAR. This publication has been prepared as an output of Rwanda SSP. It has not been independently peer reviewed. Any opinions expressed here belong to the author(s) and do not necessarily reflect those of IFPRI, EU, USAID, or CGIAR.

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