

Identification of Variables Driving Poverty Reduction Among Rural Coffee and Non-coffee Growers in Rwanda

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The research described in this brief makes an empirical contribution to poverty analysis of rural households in Rwanda. The objectives of the research are to identify variables driving poverty reduction in Rwanda and elucidate any difference between farmers growing coffee and non-coffee growers. The report also connects the current findings to further analysis that will be performed using recent data, which were not ready yet for use at the time of writing this brief. Regression analyses have been undertaken using two different data sets collected in 2001 from 498 coffee growers and 4376 non-coffee farmers. The results indicate that households that grow a wide range of staple crops, who possess a large number of livestock and who are engaged in the commercialization of eggs and milk production are less likely to be poor. People who attended primary school and have a small family size are more likely to be among the more prosperous. Households headed by females are more likely to be poor. Poverty incidences are found to be more prevalent in the southern province of Rwanda. The results also show that, although there are similarities between coffee growers and non-coffee growers in terms of critical factors of poverty reduction, there are important differences that need to be taken into consideration when a poverty reduction program is implemented.

Background

Agriculture is the major sector of the Rwandan economy. It is a small-scale enterprise and employs most of the rural labor force, as around 90% of the Rwandan population lives in rural areas. Agriculture is also a major component of the gross domestic product. Besides growing staple food crops, a considerable number of farmers grow traditional cash crops, such as coffee (around 10%). Coffee is one of Rwanda's most important sources of foreign exchange and an important source of income among farmers. The collapse of world bulk coffee prices in the late 1990s eroded farmers' incomes and threatened the long-term viability of the coffee sector. In 2001, the Government of Rwanda began implementing policies to revitalize the coffee industry through the liberalization of coffee marketing and total quality improvement.

In this research brief, preliminary findings from data collected in 2001 will be used to present the variables that drive poverty reduction, and any difference between coffee growers and non-coffee growers will be elucidated. The 2001 data set forms the baseline study and this report is an introduction to further analyses that will be undertaken using data collected in 2007.

In 2001, Rwanda was only producing coffee for the commodity market and had not yet implemented the policies mentioned above. As Rwanda has been implementing these policies, upcoming results will evaluate the impact of government coffee policies on livelihood conditions of coffee growers. The results

will also show how the situations of coffee and non-coffee growing households have changed over time. Understanding how these policies translate into household outcomes is important for development policy.

Important Findings

Data from a household expenditure survey, conducted in 2001, was divided in two rural data sets: a data set of 4376 non-coffee farmers and another one of 498 coffee growers. Respondents from urban areas were excluded from the analysis. An econometric technique, called multinomial logistic regression, was used to explore the role of agricultural and non-agricultural variables in poverty alleviation across the two data sets.

The outcome variable of interest, the yearly adult equivalent consumption, is a proxy measurement of income. It has been divided into five consumption categories. Results indicated which variables had the greatest impact on the likelihood that the household would fall into a particular consumption quintile. Lower quintiles stand for being poor with respect to the reference category, which is the third quintile.

Using the non-coffee data set, non-agricultural variables that have a strong impact on poverty include the sex of the head of the household, education variables, household size, non-farm and formal employment variables. The sex of the head of the household was very significant for the

first consumption quintile. There is a high probability that female-headed households are relatively poor. Education is also a determinant factor of poverty but has a different effect across consumption quintiles and the sex. More adult males with no education increase the likelihood of being poor and decrease the likelihood of being rich. On the other hand, females who attended primary school had a low probability of falling into the lower consumption quintiles. This is also true of males who attended primary school. Non-farm employment and participation in formal wage market were significant across quintiles with the expected pattern. More employment increases the likelihood of falling into the higher income category. Another key determinant of household consumption level was the household size. Being part of a large household size greatly increases the likelihood of being poor.

Agricultural variables, which were significant across all categories of consumption quintiles, include the farm size per capita, the number of staple crops grown, the number of agricultural workers per household, the value of livestock and

whether the household is selling milk and eggs. Increasing farm size per capita contributed significantly to reducing poverty. The results also showed that more agricultural workers per household is associated with being poor. This is a sign of decreasing return to labor in land-constrained environment of Rwanda. Furthermore, increasing the number of staple crops grown and increasing the number of household livestock are associated with high consumption quintiles. Selling milk and eggs increased the probability of falling into high consumption quintiles or decreased the probability of falling into low consumption quintiles.

Moreover, the results showed poverty differences across regions. Living in the southern province of Rwanda increased the probability of falling into the lowest quintile and decreased the likelihood of falling into the high consumption quintiles. Over the last six years, the USAID Partnership to Enhance Agriculture in Rwanda through Linkages (PEARL) project has been helping coffee growers, particularly in the southern province, to export to high quality markets. Further analysis, using coffee data collected in 2007, will

Figure 1a, 1b. Venn diagram of coffee growers' and non-coffee growers' determinants of poverty in the first quintile(left) and in the second quintile (right).

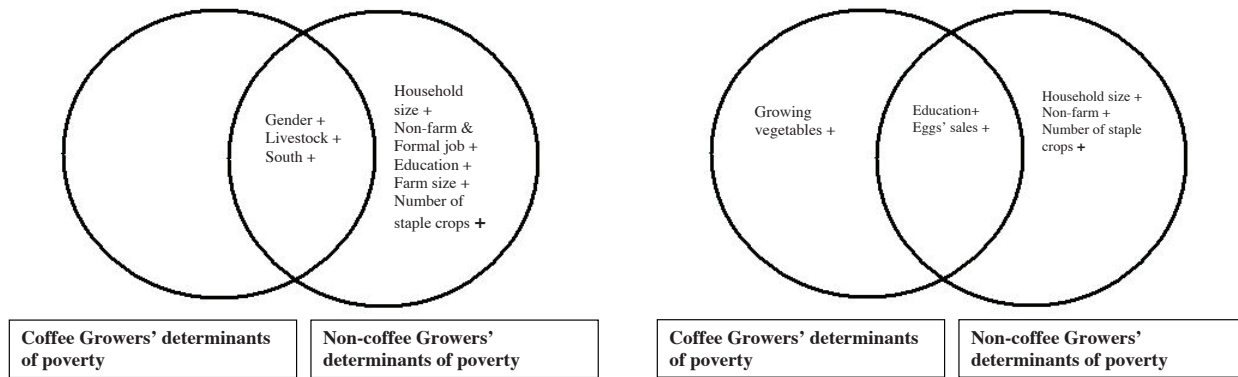
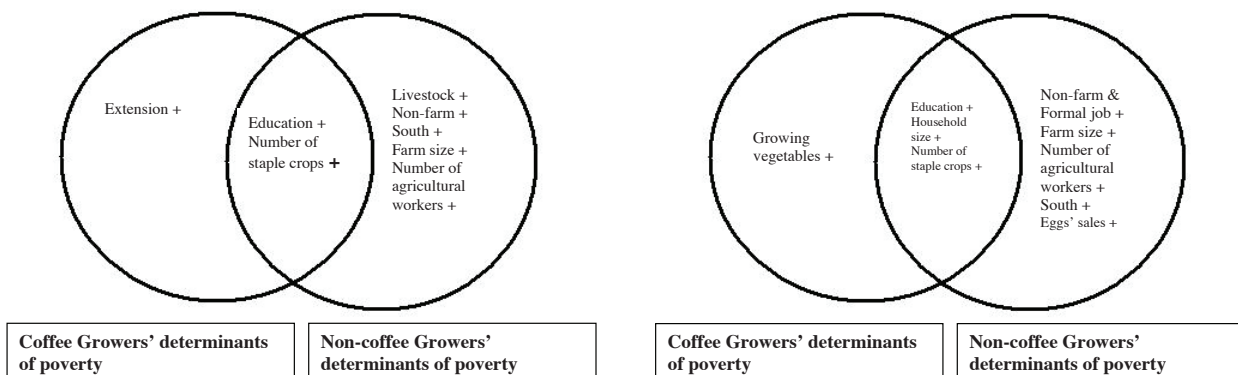


Figure 2a, 3b. Venn diagram of coffee growers' and non-coffee growers' determinants of poverty in the fourth quintile(left) and in the fifth quintile (right).



evaluate whether the project has helped in reducing poverty in that province.

Using the two data sets collected in 2001, we investigated whether factors related to poverty differed between coffee growers and non-coffee growers. We found that the factors correlating with poverty in both groups include the following variables: sex, the total number of staple crops grown, the value of livestock, education, household size, whether a grower is selling or not eggs and milk, and whether the grower is living in the southern province. There were, however, differences across the two data sets. Some variables that were significant using the non-coffee data set were no longer significant using the coffee data set. These include the following variables: the farm size per capita and the non-farm and formal employment variables.

A research essay related to these findings analysed the role of coffee supply chains in reducing poverty. Investment in coffee washing stations to produce high quality coffee may have created non-farm income among coffee growers. It will therefore be important to assess whether the 2001 results still hold, when using the 2007 data, with respect to the role of non-farm activities in poverty.

Alternately, the extension variable, that was not significant using the non-coffee data set, had the expected pattern from the coffee data results. Extension was associated with high consumption quintiles among coffee growers. Comparisons of the findings between the two data sets highlight the need of specific policies depending on the type of farmers.

Practical Implications

The current Rwandan Economic Development and Poverty Reduction Strategy stipulates that to eliminate poverty, Rwandans should replace subsistence agriculture with commercial agriculture. Findings of this study showed, however, that households that grew a large number of staple crops were less poor than others. This was confirmed using both coffee growers and non-coffee growers' data sets. Given the major role played by staple crops for household expenditures, agricultural policies that impose restrictions on the cultivation of staple food crops to free land for cash crops will not be helpful for farmers. The ultimate objective for poverty in Rwanda should be household food security rather than commercialization of agriculture.

The findings call for policies to support research and dissemination of technology that increase the yield of staple crops and economic return of the land-constrained capital. Similarly, the farm size per capita, which was very significant in poverty reduction among non-coffee growers, can be addressed using the same strategy of improving land productivity.

Increasing the value of livestock and sales of livestock products such as milk and eggs were also associated with poverty reduction regardless of whether a farmer is a coffee grower or not. Policies to increase the proportion of farmers engaged in animal production will, therefore, be important in improving the welfare of farmers.

Another important finding for policy was the poverty gap between males and females. A male-headed household had a higher probability of falling into high consumption quintiles than female-headed households. This calls for policies to address the gender gap in Rwanda. Current population census shows a higher proportion of females compared to males and an increase in the number of vulnerable groups, such as widows, as a consequence of the 1994 Rwandan genocide.

Results also highlighted regional differences; the southern province seemed to be behind others in terms of poverty level. Policy makers should consider this fact and implement programs that address the inequalities across provinces.

Finally, although there were many similarities between findings from coffee and non-coffee grower data sets, there were also differences. There is, therefore, a need for targeting policies depending on the type of crops farmers are producing.

Further Reading

Loveridge, S., A. Orr, and A. Murekezi. 2007 "Agriculture and poverty in Rwanda. A comparative analysis of the EICV1, EICV2, and LRSS surveys." submitted to Oxford Policy Management for publication in September 2007.

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This research project is aimed at identifying variables driving poverty reduction in Rwanda, with special attention given to elucidating any difference between coffee growers and non-coffee growers.

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