Extended Abstract
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Paper/Poster Title	**The Smallholder Financial Inclusion index: measuring farmers' access to and usage of financial services in the Global South**

Abstract prepared for presentation at the 98th Annual Conference of The Agricultural Economics Society will be held at The University of Edinburgh, UK, 18th - 20th March 2024.

Abstract	***200 words max***

Smallholder farmers are among the most financially excluded groups in the Global South. Financial inclusion is a complex and multidimensional phenomenon and indicators are essential to identify and target excluded groups. We develop a framework to link the concepts of access and usage of financial services and propose the Smallholder Financial Inclusion Index (SFI). We use Multiple Correspondence Analysis to identify 12 relevant indicators to measure financial inclusion and their weights. We use data from small farmers in Bangladesh, Uganda, Tanzania, Nigeria, and Ivory Coast to compare household-level financial inclusion. A censored regression model then analyses the factors driving household financial inclusion.

The SFI identifies the most financially deprived households and allows comparison of them at the regional and national levels. The aggregated results show that, on average, smallholder households have low levels of financial inclusion, with a mean value of 22.74. Further, the censored regression analysis results indicate that financial advice is the most significant contributor to financial inclusion, increasing SFI by 16 points, but only 2.8% of the households report having access to it. The study provides a valuable tool for applying a data-driven multidimensional index for identifying smallholder households that are the most financially excluded.

Keywords	Financial Inclusion, Composite Indicator, Multiple Correspondence Analysis, Smallholder agriculture, Global South
JEL Code	Q140 Agricultural Finance

Introduction	***100 – 250 words***

Financial inclusion is a multidimensional phenomenon encompassing access to useful and affordable financial products and services that meet individuals' needs. Many rural households in the Global South have little or no access to financial services, and an estimated 500 million smallholder households account for those most financially excluded. To understand and identify financially excluded groups, policymakers need appropriate indicators for measuring access to and usage of financial services. Access to formal financial services aims to foster account ownership and is key to increasing banking penetration. However, the mere possession of a bank account and access to banking services is not enough to generate financial inclusion. Estimating the usage of financial services is also crucial to assessing the actual consumption of financial services.

While previous studies have measured financial inclusion at the global and national levels, no frameworks have been proposed to assess whether a household is financially included. Moreover, an index for measuring financial inclusion among smallholder farmer households is crucial as access to and usage of finance enhances savings, agricultural productivity, and equipment and technology adoption. We conceptualize the Smallholder Financial Inclusion Index (SFI) as a multidimensional indicator to measure smallholder farmers' access to and usage of formal financial services. This study proposes a framework for a household-level measure of financial inclusion and tests the index using data from five countries from the Global South.

Methodology	***100 – 250 words***

The study introduces a novel approach to assessing financial inclusion at the household level. We conducted a Multiple Correspondence Analysis (MCA), which considers financial inclusion a multidimensional latent variable. MCA was applied in two stages using 2015 and 2016 data from the World Bank's CGAP Smallholder Household Surveys from 5 different countries to identify relevant indicators that capture the access to and usage of financial services. The dataset included 8,655 observations from agricultural households in Uganda, Tanzania, Bangladesh, Ivory Coast, and Nigeria.

The first MCA stage served to identify the indicators' significance and impact on the latent variable. The second stage was used to derive the indicator weights. After the second MCA was estimated on the final list of indicators, the weights were adjusted so the final index values would lie between 0 and 100. Hence, the Smallholder Financial Inclusion index gives each household a value between 0 and 100, which is the average across indicators of the weighted sum of each binary category of each indicator. Finally, we used a censored regression to uncover drivers of financial inclusion, whereby the SFI score was the outcome variable, and variables representing sociodemographic characteristics, information channels, economic characteristics, and production characteristics were used as independent variables that capture the context of the agricultural households.

Results	***100 – 250 words***

The results of the MCA allowed identifying 12 indicators to measure the access to and usage of financial services. For the access dimension, six relevant indicators were identified: account at a Financial Institution, mobile money account, savings at a bank, savings at Credit Cooperative Organisation or Societies (SACOOs), access to formal loans, and access to credit and payment plans. For the usage dimension, six relevant indicators were identified: usage of an account at a Financial Institution, usage of a mobile money account, usage of savings at banks, usage of savings at SACOOs, usage of formal loans, and usage of credit and payment plans.

The SFI allows for identifying the most financially deprived households and allows comparison of them at the household, regional, and national levels. In our study, the aggregated results at the country level show that, on average, smallholder households show low levels of financial inclusion with an SFI mean value of 22.74 (out of 100) and 45.6% of them belonging to the lowest decile. The country comparison shows that Uganda has the highest mean SFI score at 35.45, followed by Bangladesh with a score of 31.85. Tanzania, Nigeria, and Ivory Coast reported scores under the sample mean with values of 22.49, 17.79, and 11.28, respectively. Further, the censored regression analysis results indicate that information channels significantly increase financial inclusion. In particular, we find that households who receive formal financial advice from banks or extension agents display, on average, 14.87 points higher in the SFI index.

Discussion and Conclusion	***100 – 250 words***

Smallholders must have access to financial services to make investments, enhance productivity, and implement climate change adaptation measures. The lack of financial inclusion among smallholders in the Global South makes it particularly important to target respective households with specific policy programs designed for this end. For those programs to be efficient, it is crucial to identify financially deprived smallholder households since regional and national interventions are not economically feasible and efficient. To this end, this study provides a valuable tool for identifying smallholder households that are the most financially excluded. The proposed index shows that financial inclusion among smallholders in developing countries can be measured using a data-driven multidimensional index of several indicators. While the index values can be taken to compare single households about their financial inclusion and identify the most deprived households, the index values can be further used to make comparisons at the country level.