POLICY BRIEF

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Determinants of adoption of climate-smart and sustainable coffee production practices and their impacts on coffee productivity

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SUMMARY

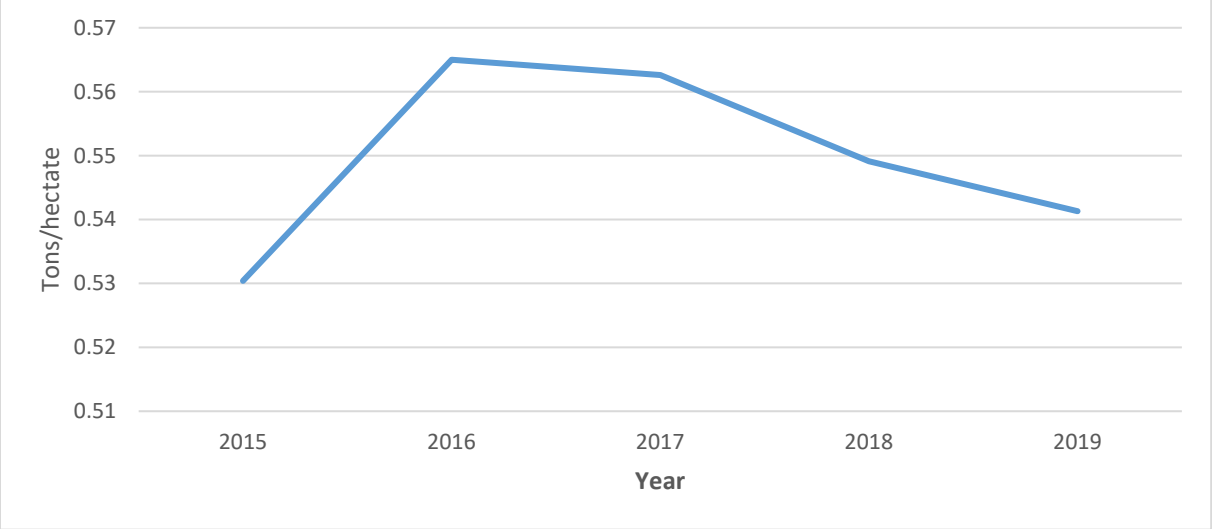
Weather extremes have significantly impacted coffee productivity in Uganda. To try to boost productivity, research institutions, government development agencies and policy makers in Uganda introduced climate-smart coffee sector interventions promoting cultural pest and disease control, soil fertility and water retention, and

intensification. Few farmers, however, have adopted these practices. This study sought to identify the factors affecting farmers' adoption of climate-smart and sustainable practices and how adoption of the interventions impact coffee productivity. Findings show that younger farmers, better-educated farmers, and farmers who belong to farmer groups were more likely to adopt the practices. The climate-smart practices had the greatest impact on yields when they were adopted in combination.

INTRODUCTION

Weather extremes have significantly impacted coffee productivity in Uganda, Africa's second-largest coffee producer. The country produces 3–4 million bags of the crop annually, which accounts for 18% of its annual exports (Bunn et al., 2019). With climate change, Uganda's coffee-growing regions have become drier and hotter, and their productive potential and capacity have declined (Figure 1). The net effect of this decrease in productivity has been a drop in the country's coffee exports and a dip in the livelihoods of more than 1.7 million smallholder coffee-farming households.

Figure 1: Coffee productivity in Uganda, 2015–2019



Source: FAOSTAT, 2021

Research institutions, government development agencies and policy makers engaged in Uganda's coffee sector have tried to remedy the situation by introducing climate-smart and sustainable coffee production interventions. To boost uptake of these interventions and also take care of the needs of the resource constrained coffee farmers, the interventions were broken down into smaller sequential and incremental packages (commonly referred to as a stepwise approach). Some of these practices include basic management practices (Pruning, Weeding, use of traditional seeds, and intercropping), cultural control of pests & diseases (spraying, use of improved and tolerant seeds), Enhancement of soil fertility & water retention (Mulching, organic fertilizer, afforestation, zero or no tillage and manure application, Intensification (Chemical pesticides, in-organic fertilizers, and irrigation).

Empirical evidence shows that farmers are adopting the practices at low rates. Thirty-six percent of coffee farmers adopted none of the recommended practices, and less than 50% of them adopted at least one. Only 3% of the farmers adopted all of the recommended practices. These finding are discouraging, given that over time the sector is likely to experience worsening shocks that will negatively affect the 5 million people employed in the sector.

This study sought to (1) identify the drivers of the adoption of climate-smart and sustainable coffee production practices promoted under the different steps and (2) assess the impact of the adoption of the practices on coffee productivity in Uganda.

RESEARCH APPROACH

This study made use of a sample of 1231 coffee growing households obtained from the Annual Agricultural Survey (2018/2019) dataset that was collected by Uganda Bureau of Statistics (UBOS) in close collaboration with the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and Food and Agriculture Organization of the UN (FAO). The study was based on the hypothesis that there exists heterogeneity among coffee farmers that could be driving their adoption decisions

for the different climate smart packages that are being promoted that needs to be investigated in order to inform wider uptake and impact.

MAIN FINDINGS

The study identified several factors affecting farmers' adoption of climate-smart and sustainable coffee production practices. For example, older farmers were less likely to adopt the combination of cultural pest and disease control, soil fertility, and water retention practices. Highly educated farmers were more likely to adopt all the recommended climate smart practices. Membership in a farmer group increased farmers' adoption of climate-smart practices. Access to agricultural loans was found to increase the likelihood of adoption of cultural pest and disease control and intensification practices by four percent. Farmers with access to agricultural input dealers/stores had 2% increased likelihood of adopting intensification packages.

The climate-smart and sustainable coffee production practices were found to have significant impacts on coffee yields. Adoption of only cultural pest and disease control related practices for instance resulted into a 110% increase in farmer's coffee yields. This is closely followed by soil fertility and water retention at 56% yield increase and lastly intensification practices at 52%. When adoption of the practices is carried out in combination, relative to the non-adopters, all possible combinations with cultural pest and disease control inclusive resulted in a higher percentage yield increase compared to combinations without it.

POLICY IMPLICATIONS

From the results of this study, it is evident that credit access plays a key role in the adoption of climate-smart coffee production practices, but only a small proportion of farmers reported having received a line of credit. There is a need to develop policies that will make loans from financial institutions more affordable to farmers.

The government should promote adoption of climate-smart coffee production practices by reducing financial constraints such as taxes on irrigation equipment or procure the necessary agricultural intensification equipment at the subcounty level so that farmers can borrow and use at a subsidized cost.

Through its programs such as Operation Wealth Creation and the Parish Development Model, the government can empower farmers to form cooperatives to share information and improve access to credit for group members.

To encourage mass uptake of the practices, there is need to introduce a certification plan for all coffee that is produced following the sustainable practices and offer price premium for such coffee to motivate farmers' participation. Finally, climate smart practices should be promoted as combinations having cultural pest and disease control as one of the practices if higher returns to coffee productivity are to be achieved. Finally, increased coffee productivity will depend on promoting climate-smart practices in combination, with cultural pest and disease control as one of the practices.

The findings from this investigation provide input for government entities like the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) for the development of a National Coffee Sustainability Plan, which is still nonexistent. Private sector organizations like the Uganda Coffee Development Authority (UCDA), the National Union of Coffee Agribusinesses and Farm Enterprises (NUCAFE), and coffee cooperatives can draw on the study for evidence-based strategies to scale up climate-smart and sustainable coffee production practices.

REFERENCES

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