



POLICY RELEVANCE SUMMARY



Precision Agriculture and Cotton Production in Benin: Policy Relevance-Summary

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Research objectives

The objective of this proposed research is to evaluate the adaptability and the profitability of a new production technique, precision agriculture (PA) that will help solve both the short term and long term economical and the ecological problems caused by cotton production in Benin. Precision Agriculture (PA) -also known as precision farming (PF) or site specific crop management (SSCM) - is considered by many as the agricultural system of the 21st century as it brings information technology into agriculture. It is a holistic farm management strategy that permits farmers to adjust input use and cultivation methods – including fertilizer, pesticide, planting, seed, tillage, water application – to match varying soil and landscape characteristics. One of the purpose of this research was to identify in the field some of the constraints faced by cotton producers and propose a mechanism of adoption given their socioeconomic and institutional environment.

Institutional and political background

Politically, cotton production was vertically integrated under a monopolistic system. The government owned company, Sonapra, was the only provider of inputs but also the only buyer of the crop. It also provided all the necessary technical assistance to farmers. This situation of total control had led to a chronic mismanagement that finally forced the government, under international pressure (France, World Bank, International Monetary Fund) to be progressively withdrawing from the sector and pass on to the private sector. The final object of the institutional reform still undergo, is for the government to completely withdraw from the management of the cotton sector.

To that end, a new institutional system was set up to manage the whole sector from input distribution to production export. The new institutional structure in agreement with the government should continue to insure that all inputs are sold at the same price to all farmers across the country, all the production is bought at a predetermine price, and that

all farmers have access to inputs at no initial cost. To this date, the transition process has not been successful. Competing professional associations have been created, disrupting the input distribution, cotton production and collection process. This situation raises uncertainty about the future of cotton production in Benin.

The inefficiency of the new institutional system resulted in unattended consequences. More and more farmers have difficulties having access to inputs in sufficient quantity and quality. Quantitatively, because of the limited availability on the market, input price has increased. Qualitatively, input dealers have lowered the quality of the products imported in order to increase profit. As a result, productivity dropped by 20% after 1998 (when the input distribution reform began). On the income side, farmers are also increasingly exposed to fluctuating world prices.

Policy relevance

One of the components of the research is to analyze the **policy risk** related to the current institutional instability and its impact on farmers' production decisions (crops to produce, crop rotation, fertilizer quantity used, etc) both for adopters and non adopters of PA technology. It provides decision makers with the tools to evaluate the consequences the outcome of the institutional transition could have on cotton farmers production decisions. For example, what impact future input and output prices will have on their decision to adopt new technologies, or reduce the land area allocated to cotton production. Information on future consequences of current decisions could be a valuable information for policy makers.

Background on cotton production and environmental damages

Though extremely important the economic aspect is not the only and most important aspect that is obstructing the future of cotton production in Benin. Increased production was essentially obtained through an increase in acreage. The intensification of the production has multiple destructive consequences on the ecological system. The profitability of cotton production led to a significant reduction in the soil rotation traditionally observed that resulted in the deterioration of soil fertility.

All the actors involved in the sector in Benin are aware of the dangers of cotton production dynamics and cultivation techniques on the ecosystem in general and on soil fertility in particular (Ton). But solutions to these problems have to be found within the political and economic context. Benin's government has been taking actions to solve some of those problems. They try to encourage cotton farmers to diversify their production and include more food crop in order to reduce their exposure to the increased price risk they now face. They also encourage farmers to alternate their productions practices and produce more food crops. Many of the alternatives the government is attempting to introduce have not yet been successful.

Policy relevance

The proposed study first details mechanism of PA adoption given the prevailing socio-economic and production environment. Then, it compares the costs and benefits of the technology adoption. It provides policy makers with the tools to make long term

decisions related to the sustainability of cotton production. It also offers production risk management alternatives. The results lay out optimum production strategies and extrapolate on the adverse consequences of current production methods.

Conclusion

This research lays out the conditions and infrastructure requirement for the adoption of PA. It then analyzes the profitability of the technology, determines the optimum production strategy for a cotton producer (adaptor or non adaptor), and extrapolates on the potential long term environmental benefits. Finally, a policy risk analysis was conducted to investigate the potential consequences of the institutional transition in the cotton sector and its impact on farmers' production decisions.