



Innovating agricultural extension services to increase maize production and reduce food insecurity in Benin

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Key messages

- Providing free agricultural inputs and close advisory services to farmers can significantly increase maize production to support food security in Benin.
- Standard agricultural extension services should include measures to improve maize farmers' access to agricultural inputs and advisory services.
 - Increase the number of extension agents, especially during critical production phases.
 - Relieve credit constraints so farmers can afford improved inputs and new technologies.

An integrated agricultural program aims to tackle food insecurity in Benin

Despite agriculture being the most important sector, **food insecurity is a problem facing many in Benin**. Increasing food prices since the 2008 financial crisis and extreme climate events – including droughts and floods – since 2010 have led to food shortages in the country. In response, **the Ministry of Agriculture in Benin implemented the Project to Support Food Production and Build Resilience in the Alibori, Borgou, and Collines departments (PAPVIRE-ABC)**.

PAPVIRE-ABC complements standard agricultural extension services provided by the Government of Benin. It works to train farmers in new agricultural practices, including the use of climate-resilient seeds for staple production.

PAPVIRE-ABC has three components, one of which is to develop agricultural value chains and resilience to climate change. Agricultural extension services are delivered as part of value chain development.

To help understand the best ways to support farmers to increase cereal production, **a team of local PEP researchers conducted an experiment to evaluate the impact of an innovative resource-intensive extension delivery model**.



The experiment

The team designed the “resource-intensive” extension delivery model to combine the strengths of previous extension services models and mitigate their shortcomings, as identified in the literature. The researchers investigated whether a more intensive schedule of visits combined with the free delivery of the recommended quantities of inputs for a small maize plot can increase farmers' adoption of new technology.

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What is PAPVIRE-ABC?

The Project to Support Food Production and Build Resilience was introduced in 2016. It aims to revitalize food production and address food security issues by unleashing the agricultural development potential in three of the most fragile and economically, socially, and environmentally disadvantaged municipalities in selected regions of Benin: Alibori, Borgou, and Collines.

PAPVIRE-ABC relies on and works with agricultural extension services in each of the municipalities to achieve its aims. It provides incentives to the extension services to assist more closely and customize the advice they provide to the farmers.

What are extension services?

In the context of Benin, the standard extension service consists of farmer-field-school training on demonstration plots, harnessing learning-from-peers to encourage the adoption of new technology. Farm visits by extension agents can also be requested but the supply of extension agents is too limited to meet the farmers' demand.

[Continued from front page] Over one agricultural season, the researchers conducted a randomized control trial in which beneficiaries of the “resource-intensive” extension services were selected through a lottery (the “treatment” group). Those who were not selected were the “comparison” group.

The comparison group received a “hybrid-extension” package of the standard extension services of training and visits from agricultural advisors (extension agents) to teach them best practices for maize production, plus free improved seeds.

Treatment group farmers also benefitted from farmer-field-school training, combined with free improved seeds, fertilizers, pesticides and herbicides sufficient for a 500m² plot. Extension agents were also assigned to the treatment group farmers and financially incentivized to provide onsite training at the main stages of production.

The research team also collected data from the subsequent agricultural season when both groups received only the standard extension services. This allowed the researchers to evaluate whether the effect of the treatment persisted.



Key findings

Resource-intensive extension services (free inputs combined with intensive advisory services) can significantly increase maize productivity in Benin, but only while the services are in place.

- **The treatment group produced on average 24% more maize per hectare** than the control group in the first agricultural season.
 - Treatment group farmers also perceived a significant increase in plot-level productivity.
 - The bottom 30% of farmers in terms of maize yield did not experience any significant gain from the treatment.
- **The gain in production vanished in the subsequent agricultural season**, when all farmers received only the standard extension model.
 - Few farmers continued using the new technologies in the second agricultural season, despite having observed production gains in the first season.
 - Some farmers could not afford the improved inputs.
- The number of households with a poor food-consumption profile increased in both treatment and comparison groups from the first to the second agricultural season.

Conclusions and policy implications

The resource-intensive model – where all inputs were provided to farmers and the extension agents were incentivized to support farmers in using the inputs appropriately – **can be effective for increasing maize production**. However, **one season of exposure to the resource-intensive model is not sufficient to produce a lasting increase in production**.

That the increase in maize production was not sustained when the treatment group farmers returned to the standard extension model could indicate that one agricultural season is not enough for farmers to master what they learned.

This finding could also point to issues in the standard model. In some cases there were not enough extension agents, in others, the agents were not well-equipped and motivated to carry out regular visits to all the farmers during the key production phases.

To improve extension delivery models, policymakers should **increase the number of agricultural extension agents, especially during critical production phases**. Policies are also needed to **help farmers absorb credit constraints and afford the (improved) inputs** that can dramatically increase production. Such policies could boost farmers’ confidence in taking the risks associated with adopting the new technology.

That the number of households with a poor food-consumption profile increased from the first to the second season suggests that more efforts are needed to **encourage diversified food production and consumption**, and to ensure that all households improve their food-consumption profile.



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