

# TWO HEADS ARE BETTER THAN ONE: AGRICULTURAL PRODUCTION AND INVESTMENT IN CÔTE D'IVOIRE

Authors: Aletheia Donald, Markus Goldstein and Léa Rouanet<sup>1</sup>

## KEY MESSAGES

- Increasing agricultural productivity and investment is critical to reducing poverty, particularly in Sub-Saharan Africa, where agriculture remains the dominant income-generating activity. In Côte d'Ivoire, rubber is a key export crop, however aging plantations have dampened the crop productivity in recent years. Its production is also highly male-dominated, with women making up only a small share of producers.
- One potential way to promote investment and improve the efficiency of household farm production is to empower women as co-managers and facilitate the coordination of production decisions within the family. To test this approach, we worked together with the Ivorian rubber professional association APROMAC to offer farmers subsidized rubber seedlings combined with either an individual training or one that included their spouses.
- Farmers that received the individual training experienced a decrease in harvest and yields as labor was re-routed to intensive upfront planting and care activities for young, non-producing rubber seedlings. However, the wives' participation in the couples' training group allowed households to have higher levels of investment and to cushion this drop in production, allowing those households to maintain pre-program production levels.
- The couples performed better due to improved management and a reduction in traditional gendered divisions of labor. The wives' presence and participation in the creation of an action plan for rubber cultivation increased their visibility and planned responsibility in rubber production, which in turn improved the efficiency of household farm production and promoted higher levels of investment at lower cost.

## GENDER INNOVATION LAB

The Gender Innovation Lab (GIL) conducts impact evaluations of development interventions in Sub-Saharan Africa, seeking to generate evidence on how to close gender gaps in earnings, productivity, assets, and agency. The GIL team is currently working on over 80 impact evaluations in more than 25 countries with the aim of building an evidence base with lessons for the region.

The impact objective of GIL is increasing take-up of effective policies by governments, development organizations, and the private sector to address the underlying causes of gender inequality in Africa, particularly in terms of women's economic and social empowerment. The Lab aims to do this by producing and delivering a new body of evidence and developing a compelling narrative, geared towards policymakers, on what works and what does not work in promoting gender equality.

<sup>1</sup> The authors would like to thank Gaëlle Conille for preparing the policy brief.

## CONTEXT

Agriculture is the dominant income-generating activity in Sub-Saharan Africa, but agricultural productivity remains low in the region. Investment in agricultural production is often costly for poor households, particularly for crops that take several years to mature.

Rubber is particularly important in Côte d'Ivoire—Africa's top rubber exporter—though productivity is dampened by the old age of current plantations and the use of non-improved seedling varieties. Rubber production requires considerable investment: it takes six years to start producing latex, but the plants require significant upfront care during the first few years.

Rubber is also a male-dominated export crop, with women making up only a small share of rubber producers—meaning they are excluded from important decisions regarding rubber cultivation within most households. This exclusion from important planning decisions may potentially lead to lower investment and inefficient production.

This experiment took place in the context of the Côte d'Ivoire Agricultural Support Program (PSAC), a World Bank funded project aiming to increase rubber productivity in the country. Among other interventions, the project subsidized a high-yield variety of rubber seedlings that was delivered to smallholder farmers across four regions in the south (Gboklé, Grand Ponts, La Mé and Sud-Comoé) and four regions in the center of Côte d'Ivoire (Haut-Sassandra, Iffou, Moronou and N'Zi).

## WHAT WE DID

In the context of the World Bank PSAC project and working together with the Ivorian rubber professional association APROMAC, we innovated on APROMAC's standard agricultural extension training to address the twin problems of low agricultural productivity and low participation of women in rubber production.

In 2016, farmers were assigned to receive two variants of the standard agricultural extension training, through randomization at the community level. Among 2,500 eligible male farmers<sup>2</sup> who applied to receive ~600 (2 hectares worth) subsidized high-yield variety rubber seedlings from the program, 30 percent were assigned to receive the training by themselves, and another 30 percent

were assigned to receive the training with their spouse. The remaining farmers were assigned to a comparison group (i.e., to not receive any seedlings or training).

The curriculum of the training consisted of three parts:

1. A gender reflection, prompting couples to reflect on their division of labor, asset ownership and sharing of decision-making and income within the household,
2. A standard 3-day agricultural extension training related to rubber cultivation, where farmers were taught how to choose the right plot, prepare the land, space trees at planting, apply inputs, weed and intercrop,
3. The creation of an action plan, where farmers planned out the management of the first two years of cultivation.

In the couples' training group, attendance was mandatory for both the lead farmer and his spouse throughout the 3-day training (including the action plan portion). In the individual training group, the farmer assisted in the training and action plan completion by himself, with the wife only attending for the gender reflection portion.

FIGURE 1: INTERVENTION DESIGN



\* Innovations we developed

<sup>2</sup> To be eligible, farmers needed to have less than two hectares of rubber cultivated pre-program and be willing to increase cultivation.

Two years after the training—in June to July 2018—we collected data on a broad range of agricultural and other economic outcomes, as well as on farmers’ agricultural knowledge, their perception of their spouse’s knowledge, and variables capturing women’s decision-making in agriculture.

## WHAT WE FOUND

**While farmers in both the individual and couples’ training groups invested more in rubber production, those receiving the individual training experienced a decrease in harvest and yields.** Households in the individual training group planted the improved rubber seedlings, but due to the influx of young (and thus non-producing) trees that require significant upfront care, they witnessed a 26% drop in total harvest and 18% drop in yield. Receiving the seedling subsidy with an individual training also led to a significant decrease of 0.36 hectares in cocoa plot area<sup>3</sup> (a 10.8% decrease compared to the control mean). Farmers in the individual training group thus compensated for the effort of planting and caring for new rubber seedlings by decreasing harvesting among producing crops (mostly older rubber trees).

**The wives’ participation in the couples’ training group offsets drops in harvest and productivity.** In the group with wife participation, households planted 20% more rubber seedlings and were able to maintain pre-program levels of agricultural production on older trees and other crops. For example, couples’ training farmers

FIGURE 2: INVESTMENT IN RUBBER PLANTING

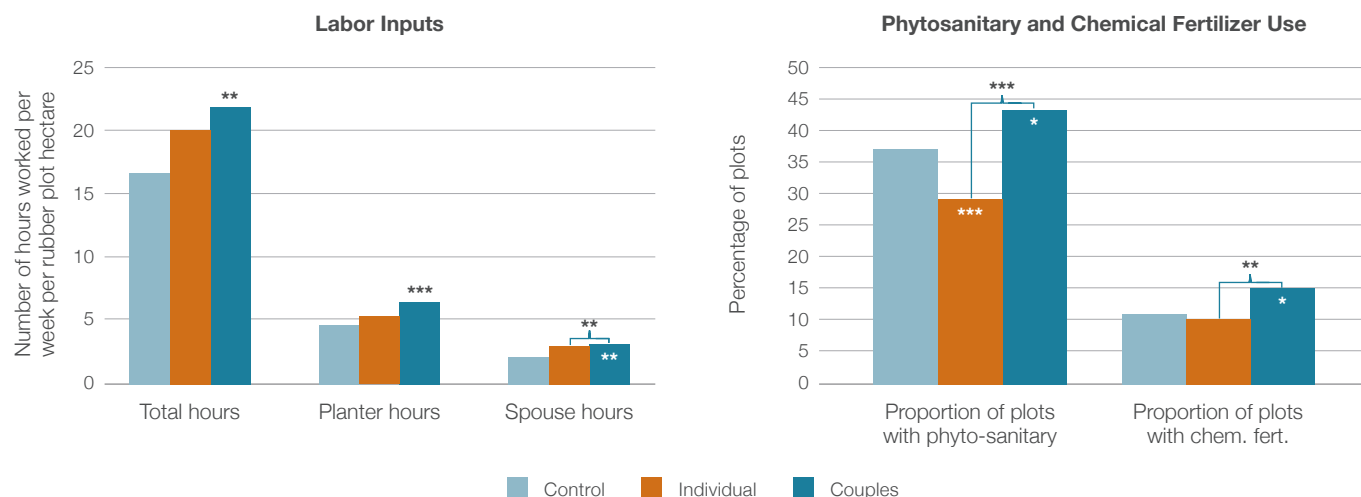


Farmers in the couples’ training group **planted 20% more trees** than those in the individual training group.

saw no change in the area of cocoa plots cultivated. They also intensified farming overall, decreasing their fallow area by 0.16 hectares (a 35.5% decrease compared to the control group).

How did this happen? Households in which the wife was invited to the extension training increased their labor hours and agricultural input use. Households in the couples’ training group worked an average of 17% more hours per week per rubber plot hectare compared to the individual training group, with increases in labor hours for both husbands and wives. They also increased the proportion of rubber plots using phytosanitary products by 14 percentage points (or 47%) and the proportion

FIGURE 3: LABOR AND NON-LABOR INPUTS



<sup>3</sup> Cocoa is the second most prevalent crop on farmers’ plots, after rubber.



using fertilizer by 5 percentage points (or 50%) compared to the individual training group. The increase in fertilizer also applied to cocoa plots, indicating how couples' training households took more of a portfolio approach in their agricultural management.

**Couples performed better because they managed their farms more effectively through joint planning.** At the planning stage, couples' training households made a more complete action plan (with management responsibility for 40% more tasks assigned to a person rather than being left blank) and were 19% more likely to retain it in the years following the training compared to the individual training group. The wife's presence and participation in the creation of an action plan for rubber cultivation also increased her visibility and planned responsibility in rubber production: wives were assigned management of over three times more tasks compared to households in the individual training group. In particular, we see women being assigned a large share of tasks that only men do in the individual training group. These changes in co-management on paper are related to the changes in agricultural practices we saw on the farm: couples' training households that made women sole managers of tasks are the ones that used more labor and non-labor inputs.

## POLICY IMPLICATIONS AND NEXT STEPS

Our study shows the economic benefits of giving women a seat at the (planning) table—providing evidence on how including women in economic management can improve the efficiency of production, allowing households to invest more at lower cost. Furthermore, our findings show that joint planning can mean *better* planning, leading to a more efficient allocation of tasks within teams.

Policymakers may need to revise the standard approach used in the delivery of agricultural extension training. While agents tend to target one individual in the household (traditionally men), it can be more cost effective to target both spouses. In fact, the couples' training in this study was highly cost-effective, with a total cost per household of USD 31, and an estimated return factor of 11x at the household level.

Future research should test whether these results generalize to other types of crops, especially those that require less skill and duration to harvest, and food staples—where yields remain far below their potential in Sub-Saharan Africa.

Finally, although the results show that including women in economic planning can improve the efficiency of household production, the intervention did not lead to meaningful changes in women's bargaining power after two years. Further work is needed to understand how to increase women's share of control over household resources.

Photo credit: Borgarello/World Bank, Brice Delagneau, John Hogg/World Bank, Nestle

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### FOR MORE INFORMATION, PLEASE CONTACT

Aletheia Donald  
adonald@worldbank.org

Gaëlle Conille  
gconille@worldbank.org

1818 H St NW  
Washington, DC 20433 USA  
[www.worldbank.org/africa/gil](http://www.worldbank.org/africa/gil)