



The role of Good Agricultural Practices in closing the Living Income gap: assessing their costs and benefits for Ivorian cocoa farmers



Is the application of GAP training contents beneficial for cocoa farmers and to what extent do they help to reduce the Living Income gap?



The training of farmers with Good Agricultural Practices (GAP) is a major strategy to boost farmers' productivity and thereby increase their household income. In the world's main cocoa producing country Côte d'Ivoire, after a sharp reduction in public extension services due to Structural Adjustment Programs in the 1990s, over the 2000s decade, multiple private and non-profit actors started to focus on scaling GAP training among farmers, particularly in the scope of their cocoa sustainability strategies (Coral et al. 2024). However, predominantly targeting farmers organized in a producers cooperative, many cocoa farmers still do not have access to regular trainings, even if public authorities moved back into the sector and continuously scale up cocoa extension activities.

While most of the GAP are not new farming activities to farmers, trainings emphasize more demanding practices such as weeding, pruning, and sanitary harvest as well as the correct application of inputs, most notably fertilizer and phytosanitary products (Asare and David 2011). Due to higher costs of cocoa farming applying GAP practices and increasing input prices, it is important to understand if the application of training contents is indeed beneficial for cocoa farmers and to estimate the sustainability of benefits in the future.

KEY MESSAGES

- Most farmers members of a cooperative and trained on GAP have a higher cocoa productivity (kg/ha) compared to non-members and non-trained farmers.
- Despite increased expenditures for cocoa farming, GAP trained farmers achieve a higher average net cocoa income, higher cocoa Net Present Values, as well as higher returns from cash crop diversification, leading to higher total household income.
- However, GAP coming along with challenging farming practices and high input costs, trained farmers face longer on-farm work time and experience higher stress levels regarding their saving ability and livelihood situation. In sum, despite increased efforts, closing their Living Income gap remains a far off prospect.
- Cocoa producers cooperatives need to assume an increased role in the delivery of supporting services. For this, they need to professionalize and be better remunerated for their efforts.



Looking at two cocoa farming household surveys (survey 1 in 2022 among N=303 cocoa farmers all organized in cooperatives targeted by the PRO-PLANTEURS project, a public-private cocoa sustainability inter-

vention in the regions of Abengourou,

Aboisso, Agoville, Divo, and Yamoussoukro, and survey 2 in 2024 among N=219 cocoa farmers organized and non-organized in a cooperative in the regions of Issia and Biankouma), this policy brief explores differences between cocoa farmers trained and non-trained with GAP. In particular, we compare their farming characteristics and practices, their livelihood perceptions as well as their overall financial situation, with a focus on the costs and benefits of GAP application as well as the implications for farmers' income situation with reference to a Living Income.

Farm Characteristics of Gap-Trained and Non-Trained Cocoa Farmers

Comparing trained with non-trained farmers in both samples reveals a significant gender gap, showing much higher shares of male and better educated farmers being trained. Furthermore, trained farmers' general household equipment endowment comprises more items indicating a tendency of higher wealth levels. Regarding their farming, trained and non-trained farmers have similar conditions: There is no difference regarding total farm size, cocoa plot size or number of cocoa plots. However, on average, the farms in the South-Western regions of Issia and Bankouma are smaller than those from the survey in the Central and South-Western regions (3.3 vs. 4.3 ha). The picture is less clear for on-farm diversification patterns in both surveys: While in survey 1 trained farmers also have higher scores in on-farm diversification for staple, vegetable, fruit trees, and livestock production as well as for the two main secondary cash crops rubber and oil palm, in survey 2, non-trained farmers have higher scores in staples, fruit trees, and livestock, accompanied with almost equal scores for all perennial cash crops.

Regarding their cocoa production, trained farmers of both samples do have a higher productivity than non-trained ones (survey 1 significantly). In both cases, productivity is positively correlated with the total expenditure on cocoa

production, particularly costs for fertilizer, phytosanitary products, and labour show strong relations. In survey 2, in addition to total cocoa costs, some GAP practices such as weeding, pruning, and replanting also show significant correlations with productivity. At the same time, these practices are also experienced as most difficult to apply by trained farmers in survey 2.

→ Trained farmers show higher cocoa productivity than non-trained ones. Given the strong gender and education gaps in training participation, this translates into a reproduction of discriminating structures for most vulnerable cocoa farmers. It is therefore important to continuously increase the extension-farmers ratio and reaching out to non-cooperative and most vulnerable farmers applying a distinctly gender-sensitive approach.

Farming Practices and Training

In both samples, those farmers who already benefitted from a GAP training also significantly have higher participation rates in diversification training and agroforestry sensitization, indicating a structural exclusion from extension services of some farmers groups (female, less educated, poorer, non-cooperative members). In both surveys, trained farmers significantly have higher scores in cocoa agroforestry, and there are significant positive correlations between the use of fungicides and the prevalence of a cocoa agroforestry system. Thus, in both samples, trained farmers have significantly higher rates of fungicide application but also higher values in the application of organic fertilizer, which also correlate positively with cocoa yield.

For the appraisal of GAP application, both surveys assumed that non-trained farmers do not apply GAPs and therefore no comparison between trained and non-trained is possible. However, looking into the trained groups of both samples, it shows that pruning is the practice most often applied but also mentioned as among the most difficult. The patterns regarding other GAP practices are less clear: While for survey 1 twig removal and sanitary harvest are mentioned as most often practices after pruning, in survey 2, it is weeding and replanting (directly reflecting the high correlation of these practices with the productivity in this sample).

Work time and work tasks have only been assessed in survey 1. Here, no differences in the implementation of work steps between trained and non-trained farmers can be identified. An interesting insight is that in both groups, when not being the farm manager themselves, female farmers most often carry out tasks like planting, pod collection, pod breaking as well as drying and selection. In both groups, workers are most often employed for field cleaning, input application, harvest and pod collection. Looking at the work time, trained farmers spend more time on their cocoa farms than non-trained ones: Not only that they spend a higher average of work time on their plots, 9% of the trained cocoa farmers in sample 1 even spend more than 8 hours on their plots per day (as compared to 6% of the non-trained ones).

→ Most farmers not trained in GAP are also not reached by other training interventions. The training share is highest for cooperative members. Therefore, simultaneous strategies are needed: improved outreach to non-cooperative farmers and incentivizing cooperative membership of cocoa producers to facilitate training delivery.

→ A trend of adopting more ecological practices among trained farmers can be observed, e.g. by the higher shares of organic fertilizer application and cocoa agroforestry systems.

Thus, there is still huge potential for the scaling up of agro-ecological strategies which should move to the heart of public and private extension services.

Economic Appraisal

In both surveys, farmers who are organized in a cooperative and received GAP and other trainings have the highest average net cocoa income and higher income from cash crop diversification, both leading to higher total income of these households and subsequently lower Living Income gaps. In contrast, those farmers not members of a cooperative and without any GAP training received have lowest incomes in all crop types and highest Living Income gaps.

Similarly, at a discount rate of 5%, for the next ten years, trained cocoa farmers of both samples have higher Net Present Values (NPVs) than non-trained ones, showing a beneficial nature of cocoa farmers' application of GAP despite significantly higher cocoa farming costs. High expenditures for GAP, particularly for labour and chemical inputs, often led to doubts whether the application is really of benefit for cocoa farmers or not.



Cocoa depot, CI 2022 (Photo: Franziska Ollendorf)



Pod collection, CI 2024 (Photo: Tokou, Bonna Antoinette)

In fact, due to these high costs, in the case of survey 1, trained farmers have a lower discounted Benefit-Cost Ratio (BCR) than non-trained ones, indicating that there is less efficiency in resource allocation once applying GAPs. However, due to the general income increase, the reduction of the Living Income gap and the higher NPV, application of GAP is still of benefit. But it is by far not enough to close Living Income gaps and in times of sharply increasing input costs, both BCR and NPV could still decrease to a critical point.

→ In times of sharply rising input prices, a stronger focus on locally manufactured, preferably organic inputs will increase cocoa farmers' resilience and independence from global market price volatilities rendering GAP application more sustainable.

Livelihoods and Support Needs

When farmers were asked about their perceptions regarding the current situation of livelihood indicators such as health, nutrition, education or their ability to make savings, non-trained farmers have more positive answers to livelihood indicators than trained ones; despite having lower farming incomes. In particular, non-trained farmers perceive their situation regarding household nutrition, health, and possibility to make savings better, the latter being significantly higher scored than by trained farmers. Perceptions regarding education ranked equal among both groups and the housing situation is seen more positively by trained farmers. Given their much higher expenditures on cocoa farming, trained cocoa

farmers seem to experience higher stress level to make some savings which are reflected in their livelihood perceptions. While non-trained farmers do have slightly higher interest in trainings on cocoa production and income diversification, trained farmers significantly show stronger interest in on-farm diversification and agroforestry training. But they are also more interested in nutrition and climate change adaption training, indicating a generally stronger interest in diverse training formats. With regard to support needs, farmers of both groups in survey 1 have very similar results but with one significant difference: the need of support with materials for trained farmers. This is reflected in the much higher (almost double) expenditures of trained cocoa farmers on cocoa farming materials. Among both groups, support with input finance and input access rank highest, followed by support with labor for the trained group.

→ In order to reduce high levels of stress perception regarding savings ability and subsequently other crucial livelihoods, pre-finance mechanisms have to be scaled-up, with a more important role of farmer cooperatives. For instance, given the current trend of accumulating farm data to improve traceability in the sector, farmers should benefit from gaining rights to possess their data and use them as collateral for credits. National regulations should specifically emphasize this potential.

The Way Forward: Professionalizing Cooperatives to Improve Farmer Support

The overall picture of costs and benefits associated with the application of GAPs shows that indeed, trained farmers are able to reduce their Living Income gaps despite high expenditures linked to GAP application. However, the Net Present Values and Benefit Costs Ratios are not too much higher compared to those of the non-trained farmers and also trained farmers are far from being able to close their Living Income gaps. Particularly, if input and food prices continue to rise, there is a high risk of GAP becoming a zero-sum game or even a loss for farmers.

Therefore, the enabling environment of GAP implementation needs to be improved and risks and burdens reduced for smallholder farmers. Particularly in the light of recent regulatory innovations, most notably the African Regional Standard for Sustainable Cocoa (ARS 1000) as well as the EU's Deforestation Regulation and the Corporate Sustainability Due Diligence Directive, and considering the manifold im-

mediate pressures arising with these new demands, sophisticated and integrated strategies enabling the sustainability transition and assuring farmers' Living Incomes are key.

The role and potential of farmer training and membership in a cooperative is exemplified by the findings of this policy brief. In particular, ways how to support, further professionalize, and incentivize cocoa producer cooperatives is a main road here. In a sector setting such as the Ivorian cocoa sector, most of the new regulatory requirements can only be met by having a vivid and highly professionalized cooperative sector in place. Currently, discussions mainly center on their role for appropriate farming data collection. But even more, in order to achieve an improved gender-sensitive extension-farmer ratio, to spread agro-ecological farming practices, to reduce farmers' financial burdens of GAP investments by providing pre-finance mechanisms and establishing professional spraying groups or sharing of farming equipment, empowered and professional cooperatives can fulfill a much more important role to drive the sustainability transition. However, for such a demanding task, cooperatives need to be able to make sustainable margins to provide quality services. Hence, in the same way as farmers' incomes need to be improved, cocoa cooperatives' value share in the global cocoa-chocolate chain need to be significantly increased in order to allow them to professionalize.



Forest plant nursery, CI 2022 (Photo: Tokou, Bonna Antoinette)

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This policy brief is based on

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