Agricultural productivity, Senegal (2021-2023)

COST-EFFICIENCY ANALYSIS, OCTOBER 2023

Summary

Catholic Relief Services (CRS) analyzed the cost-efficiency of improving agricultural productivity in Senegal rural areas through capacity strengthening of Private Agricultural Service Providers (PASPs), who in turn support young men and women farmers and existing Savings and Internal Lending Community- (SILC) groups with access to quality agricultural inputs, technical services, training, and markets, to increase production, yields and revenue. The analysis showed the following findings:

- It costs $10,272 to train and certify one Private Agricultural Service Provider individual over 2 years, which includes training, certification, and mentoring. The 28 PASPs reached 905 translating to a cost of $318 per farmer served.
- Decentralized trainings closer to the rural areas where the PASPs are located kept the training costs low and ensured reach and attendance, with a slight trade-off in terms of higher travel costs for program staff to conduct the training.
- Through strengthening the capacity of PASPs, their income increased through demand for their extension services, and the farmers' income increased through improved agricultural productivity and better access to agricultural credit.

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Introduction

In Senegal, the agricultural sector is on average six times less productive than other sectors due to an inefficient production system and the lack of access to irrigation and inputs. A study in 2015 on Rural Producer Organizations (RPO) in Senegal[1] evaluated the level of trust among potential members of the organization of agricultural collectives in the country as well as the organizations' effects. It found that collective action reduces transaction costs, increases bargaining power, and increases access to new technologies and markets. While farmers with liquidity constraints were less likely to engage in collectives since farmers would need time to realise sales to repay credit, the study stated that farmers who sold their produce through RPOs achieved higher prices per kilogram than those who sold their produce individually. If liquidity constraints can be alleviated through microfinance and trustworthy collectives can be formed among rural farmers, they can achieve higher levels of income and production while reducing risks through diversification.

Catholic Relief Services (CRS) implemented the Promoting Entrepreneurship in Rural Agriculture (PERA) project in Senegal as a rural transformation initiative to improve agricultural employment and entrepreneurship among young people and women living in remote rural communities in 5 administrative regions (Kaolack, Diourbel, Fatick, Thiés and Sedhiou.). The two-year (October 1, 2021 - September 30, 2023) project aimed to train and mentor Private Agriculture Service Providers (PASPs) who can in turn support farmers and SILC[2] groups in accessing quality agricultural inputs, technical services, skills training, and markets, to ultimately diversify crop varieties (such as millet, maize, groundnuts, and market garden produce) and increase agricultural production, yields and income.

The project also aimed to address the problems of professional integration and gender inequalities in terms of access to economic opportunities in rural areas and contribute to increasing the skills and opportunities of vulnerable young people, particularly women. Leveraging the pre-existing PASP model set up by CRS in past projects, the project implemented the following activities:

- **Trained, mentored, and certified 28 Private Agriculture Service Providers (PASPs):** The training and mentoring covered basic agricultural skills and techniques, intermediation activities between actors in agricultural value chains, and the ICT4D Commcare application to strengthen the technical, management, and entrepreneurial capacities. The PASPs were considered certified if they achieved an average score of 75% or more in the oral and written exam.
- **Linked the PASPs with access to credit:** The PASPs and their associated cooperatives were linked with Banque Agricole du Sénégal and received more than $43,600 in credit for agricultural entrepreneurship assets and activities which would indirectly benefit the farmers
- **Linked the PASPs with government support to produce certified seeds:** Two PASPs received support by the government to sow 3 hectares of millet and maize seed to give small-scale producers access to quality and affordable certified seeds and develop their farming businesses.

Analysis Approach and Methodology

Cost-efficiency analysis estimates the ratio of program costs to outputs created, allowing organisations to compare cost-per-output for programs which all produced the same output. For the PERA project, all costs utilized during the project were aggregated and utilized in determining the cost per Private Agriculture Service Provider certified.

In September 2023, CRS conducted cost-efficiency analyses on the PERA project using the Dioptra tool. This analysis was conducted over the course of four two-hour sessions.

Data

For the analysis, the main data needed were the project expenditure and output data. Expenditure data were sourced from CRS Insight finance database (including Direct Project Costs, Direct Shared Costs, and Indirect Costs for the project implementation period of October 1, 2021 - September 30, 2023) and output data were sourced from project reports. Additionally, the assessment on the final impact of farmers reached and income generated was considered.

The Dioptra Tool

Dioptra is a web-based cost analysis software that allows program staff in country offices, who are most familiar with day-to-day program implementation, to rapidly estimate the cost-efficiency of their program activities. It guides users through a standardized costing methodology, ensuring that all analysis results are methodologically consistent and can be meaningfully compared across different contexts and organizations.

[1] Building Trust in Rural Producer Organizations in Senegal: Results from a Random Controlled Trial (2015) http://ftp.iza.org/dp9207.pdf

[2] The Integration of the Private Agricultural Service Provider (PASP) model into existing SILC-PSP Networks to support smallholder farmers by using the Saving and Internal Lending Communities (SILC) as entry points and layering on PASP services within the nine SILC-PSP networks.

By using the Dioptra tool, rather than having to learn a complex costing methodology and assemble data manually in spreadsheets,[i] staff can focus on providing crucial estimates of how different resources were used across activities within a program, which are not captured in any current data system. For more information, see www.dioptratool.org/how-does-dioptra-work.

Results

It cost $10,272 to train and certify a Private Agricultural Service Provider (PASP) individual over 2 years, which includes training, certification, and mentoring.

The project managed to train and certify 28 PASP individuals with a cost of $10,272 per PASP individual over 2 years (Figure 1). The costs include training, certification, and mentoring support provided by CRS. During the project duration, the 28 PASP individuals were able to reach a total of 905 farmers, which means the project cost about $318 per farmer reached.

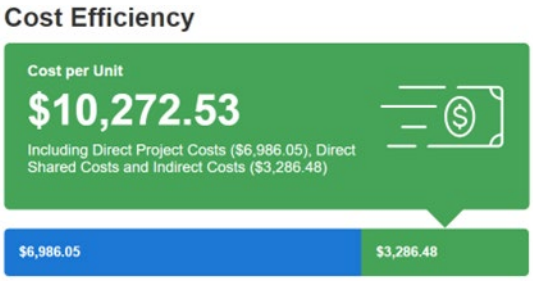

FIGURE 1- COST PER PASP TRAINED AND CERTIFIED

Decentralizing trainings closer to the rural areas where the PASPs are located kept the training costs low and ensured reach and attendance, with a slight trade-off in terms of higher travel costs for program staff to conduct the training.

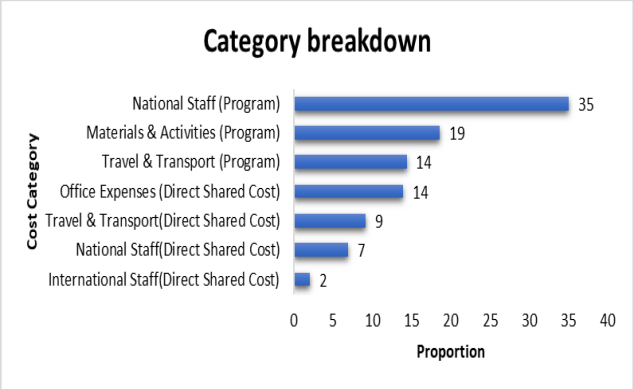

FIGURE 4-VALUE ADDITION TRAINING

FIGURE 2- COST BREAKDOWN PER CATEGORY

Most of the costs were spent on staffing (44%), since the main project activities were on capacity strengthening which is human resource intensive (Figure 2). The highest was 35% on program national staff. Further, the project spent 7% and 2% on staffing for direct shared cost on national and international respectively.

About 19% of the costs were spent on materials and activities—most trainings were held in rural areas where training facilities were less costly and closer to where the PASPs are located, reducing the amount of transport reimbursements for PASPs to attend training sessions. On the other hand, this increased the travel and transport costs (23%) for the program and direct shared staff to travel to the training locations which was an acceptable trade-off for the project to maximize the number of PASPs trained and their attendance in all training sessions.

FIGURE 2-TRAINED AND CERTIFIED PASPS

As conceptualized, the project focused on reaching more female farmers. The evaluation showed that the training topics offered by PASPs that attracted the highest proportion of women were poultry farming (70%), composting (43%), and gardening (24%)

This suggests that these agricultural activities were more contextually appropriate for women in rural areas, and they would therefore benefit the most from extension services on

these topics. More targeted investment to transform social gender norms would be required to enhance the uptake of other male-dominated agricultural activities among women.

TABLE 1 - PROPORTION OF FEMALE FARMERS REACHED BY PASPS DURING THE TRAININGS.

Training topic	Number of farmers trained	Proportion of female farmers
Poultry farming	70	70%
Composting	87	43%
Training on market gardening techniques and micro-gardening	245	24%
Sale of certified seeds	75	18%
Processing of cereal products, fruits, and vegetables	25	10%
Other activities (sale of fertilizers, manufacture, and sale of soap, Jambar stoves, bleach)	275	50%

Through strengthening the capacity of PASPs, their income increased through demand for their extension services, and the farmers' income increased through improved agricultural productivity and better access to financial credit.

The project focused on training PASPs in the first year and operationalizing their technical extension services to farmers in the second year. An assessment of the initial six months of PASP operations (October 2022- March 2023) found that PASPs realised a cumulative profit of $2,392 (Table 2). An evaluation at the end of the project found that 59% of certified PASPs reported profits within the first year of operations and 75% of farmers were satisfied with their services (Table 3), signalling promising sustainability of the PASP model moving forward.

TABLE 2- ASSESSMENT OF PASP PROFITS THROUGH THE INITIAL SIX MONTHS OF THEIR EXTENSION SERVICES.

Income	Expenditure	Profits
$3,738	$1,346	$2,392

The evaluation also found that 20% of farmers reported an increase in their average income by at least 20% through collective sales in new agricultural markets, although the remainder of them had not yet realised sales at the time of the evaluation (Table 3). Additional data is needed on this point later in their business cycle. At the time of the evaluation, about 23% of farmers were linked with financial services to access affordable credit.

The survey further showed that 35% of youths (Both farmers and PASPs) obtained a decent job or started their own business by project assistance. The decent income was calculated based on the guaranteed inter-professional agricultural minimum wage which is estimated at 41,688 FCFA ($ 70)[3].

The income obtained by PASPs is in most cases higher than the agricultural minimum wage and the decent income. This is mainly due to remuneration from SILC groups which vary between $80 and $150 per month; 75% Farmers reported satisfaction with services offered by PASPs and 74% of PASPs generated beneficial income. According to PASPs 40% of respondents said it was unlikely that the jobs or businesses created by the PERA project will remain sustainable. Continuous monitoring over the next two-years will demonstrate whether this is the case.

However, in its current conception, it would be necessary to foresee the end of PASP services beyond a certain number of years of supervision if the SILC group reaches a certain level of autonomy. This reflection would be an area to be explored further within the framework of the development of the PASP economic model. Without SILC group supervision activity which constitutes a good part of the monthly income of PASPs, the farmer technical support activity would be difficult to make profitable for them.

TABLE 3- KEY ACHIEVEMENTS OF THE PERA PROJECT.

Indicator	Achievement
% of PASPs generated profits demonstrating their value and long-term sustainability	59%
% of farmers are satisfied with high quality services offered by PASP	75%
% of PASPs have generated substantial benefits demonstrating their value and long-term sustainability	74%
% of targeted smallholder farmers who report having increased their income by 20% attributed to access to better quality inputs provided by PASPs.	20%
% of target PASP youth who obtained a decent job or started their own business thanks to PEAR project assistance.	35.9% or 94.1%[4]
Probability that the jobs/businesses created will remain sustainable after the intervention, contributing long term to the local economy.	Unlikely (20 and 40%)[5]

[3] The guaranteed minimum wage for workers in agricultural and similar businesses is set at the flat hourly rate of 236.865 CFA francs, or 41,688.24 FCFA per month for 22 days of work.

[4] Or 35.9% for entrepreneurial activities and marketing and 94.1% if we include remuneration from SILC

[5] the classification was based on a grid with 4 criteria: increase in speculation, increase in income, satisfaction with the services received and the number of cultural practices or services or products offered