



# Understanding Farmers' Needs Project

FINAL ENDLINE RESEARCH REPORT  
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# Abbreviations

<b>COVID-19</b>	Coronavirus disease 2019, SARS-CoV-2
<b>CRS</b>	Catholic Relief Services
<b>DAP</b>	Diammonium Phosphate Fertilizer
<b>FCFA</b>	Franc CFA, West African
<b>FGD</b>	Focus Group Discussion
<b>Kg</b>	Kilogram
<b>IGA</b>	Income Generating Activity
<b>IQR</b>	Inter-Quartile Range
<b>NGO</b>	Non-Governmental Organization
<b>NPK</b>	Nitrogen-Phosphorus-Potassium Fertilizer
<b>PASP</b>	Private Agricultural Service Provider
<b>PSP</b>	Private Service Provider
<b>SILC</b>	Savings and Internal Lending Community
<b>UFN</b>	Understanding Farmers' Needs Project



# 1. Executive Summary

The Catholic Relief Services (CRS) Understanding Farmers' Needs (UFN) project, implemented in Senegal in parallel with the Private Agricultural Service Provider (PASP) model project, sought to identify the value added for farmers of improved last-mile service delivery by PASPs. Prior to UFN, the focus of PASP business model development was on ensuring sustainability and profitability for the PASPs, not on how well they serve their clients. The UFN project research has enabled Catholic Relief Services (CRS) to identify the benefits to farmers of affordable access to high-quality agricultural inputs (including improved seeds, fertilizer and pesticides) and the delivery of appropriate agricultural technical services through the PASP model project in Senegal.

The endline study discussed here selected the 149 smallholder farmer respondents who had participated in the September 2020 midterm survey and told the interviewer that they had bought at least one agricultural input or service from a PASP during the previous agricultural season. The customers interviewed in the endline survey lived in the Thiès region of Senegal.

In addition to the smallholder farmer (customer) survey, the final endline study researchers facilitated one focus group discussion (FGD) with the five participating PASPs and six FGDs with Savings and Internal Lending Community (SILC)-member smallholder farmer clients. Across the six SILC FGDs, 30 members - 19 women and 11 men - who had purchased fertilizer or seeds from their local PASP in 2020 were interviewed.

## RESPONDENTS' DEMOGRAPHICS

The main crops grown by the customers interviewed were groundnuts and millet - and most customers cultivated both crops. Of the 149 respondents, 98.7% grew groundnuts and 91.3% grew millet. About 49% of the respondents belonged to at least one SILC; most women customers (92%) were SILC members, while only 39.7% of men were.

## REACHING UNDERSERVED AND UNSERVED SMALLHOLDER FARMERS

PASPs' inputs and services reached smallholder farmers who were underserved or unserved by other agricultural vendors. Over half of respondents reported that 2020 was the first time they had bought inputs from their PASP. Of these customers, 41% reported that they had never purchased the input(s) in question before, from any source.

## **INPUT PURCHASES**

The most common agricultural input purchased from PASPs was fertilizer, and all but one survey respondent bought some. In contrast, just five respondents bought millet seeds from PASPs, and one each bought groundnut and hibiscus seeds.

Most customers (72.5%) said that buying from the PASP was convenient, and that the PASP provided better service than other vendors (61.1%). About half (50.3%) thought that the types of inputs sold by the PASPs were better adapted to their needs than those sold by other vendors.

## **CUSTOMERS' SOURCES OF MONEY AND PURCHASING POWER**

Non-agricultural income generating activities (IGAs) and SILC share-out lump sums were the most common sources of money for agricultural input purchases. Among SILC members, 41 used their SILC share-out money for input purchases, while just seven took a loan from their SILC group's main fund.

For some SILC customers, the timing of their SILC's share-out facilitated using share-out earnings for input purchases. Of the 70 SILC members who received share-out money in 2020, 35.7% reported that their group's share-out was timed with the agricultural cycle.

Over 50% of customers surveyed said that their ability to buy inputs had been very affected by the COVID-19 pandemic. Common effects of Covid-19 were income shocks from ceased IGAs and lack of work due to lockdowns and market closures.

## **PASPs' ACQUISITION OF INPUTS TO SELL**

To sell inputs to their customers, the PASPs had to acquire them from manufacturers or wholesalers. The PASPs met their customers' demand for fertilizer by coordinating on a bulk order involving all nine of the country's SILC PSP networks, while each PSP network ordered seeds on its own.

## **GENDER AND MARKETING**

Because the PASPs sold farming inputs and services, they had fewer inputs to offer SILC members, most of whom were women, because few women had access to land to cultivate using the types of fertilizer or certified seeds sold by the PASPs.

## **PASP MARKETING AND TECHNICAL ADVICE**

To market their inputs and services, the PASPs produced a professionally designed flyer to distribute to potential customers in the communities they serve, participated in a radio program to spread the word about their offerings and held awareness meetings for producers in villages where they distributed their flyer.

Almost all customers surveyed said their PASP had explained how to use the inputs upon delivery. But when asked if the PASPs discussed their specific crop needs while they were ordering inputs, or whether the PASPs just took their order, just 53.4%





## CUSTOMERS' AGRICULTURAL PRODUCTION IN 2020

While the COVID-19 pandemic caused financial hardships for many customers, production increased or remained the same for 55% of respondents in 2020 compared to the previous growing season. Several respondents attributed this increase simply to “better harvest,” while 18 credited the fertilizer sold to them by the PASP.

## PASP HELP WITH CUSTOMERS' CROP SALES IN 2020

Almost three-quarters of the customer survey respondents sold at least some share of their crops in 2020, but just 14.5% sought PASP help with their crop sales. These customers had on average smaller agricultural production than the full survey sample. It is possible that more customers will request their PASP's help with crop sales in the 2021–2022 season and beyond: 43.6% thought they would use the PASP this season for sales support.

The PASPs' support for crop sales was mostly limited to investigating crop prices in area markets and communicating that information to their customers, so the customers could take their crops to the market with the best price.

## LESSONS LEARNED

Farmers chose to buy inputs from PASPs based on the inputs' quality and convenience, and the availability of the PASP throughout the buying process. Payment was convenient for the PASPs' customers; customers viewed the PASPs' input and services as high-quality and thought that they complemented those offered by other vendors.

However, some improvements should be made to the PASP delivery model in future rollouts. First, more work is needed to train PASPs on the different crop production cycles to complement the technical support they already provide on the inputs they sell to their farmer customers for those crops. Second, PASPs in Senegal should work to gain access to certified groundnut seeds to increase their seed and fertilizer sales. Third, links between SILC and PASPs should be strengthened to take full advantage of the potential customer pool provided by SILC to identify agricultural crops that are cultivated by women, including dry season gardening, then procure and sell the inputs for these crops. Finally, PASPs should be trained to help their farmer customers organize collective sales to increase the prices the farmers receive for their crops.



## 2. Introduction

### 2.1 THE PRIVATE AGRICULTURAL SERVICE PROVIDER MODEL PROJECT

The PASP model was developed to fill a gap whereby overstretched national agricultural extension systems cannot reach most smallholder farmers effectively, especially women, by improving input supply systems that fail to support smallholders adequately and building financial capacities that are not well taught through contemporary extension and advisory services. Many government agencies, international non-governmental organizations (INGO), local non-governmental organizations (NGO) and social enterprises have put agricultural advisory services in place to help farmers increase production and yields, and access markets – but they often overlook farmers living and working in the most remote rural areas. These services rely on an overstretched and insufficient cadre of agents or extension workers tasked with building farmers’ technical capacity. These systems perpetuate a cycle that maintains or slightly improves existing standards, without focusing on developing the business management skills of farmers and/or the agents themselves. Furthermore, they often fail to reach the poorest farmers, many of whom are women. Women receive only 5% of agriculture training and advisory services worldwide – in part because of time poverty and limited mobility, but primarily because of negative gender norms related to household decision-making.<sup>1</sup> Moreover, many rural young people lack viable market entry prospects, which discourages them from entering the sector, contributing to chronic youth unemployment and depriving a generation of profiting from the agricultural sector.

The PASP model project<sup>2</sup> sought to address these inequities with a focused effort on increasing the capacity of last-mile input sellers, called PAsPs, to advise smallholder farmers on quality input use and increase their access to quality inputs and/or basic veterinary services to improve their – and their communities’ – livelihoods and crop production. The project worked to create a stable income stream for the PAsPs themselves, who are often individuals with significant promise and recognition in their communities yet have few opportunities to increase their incomes.

<sup>1</sup> Food and Agriculture Organization. 2011. The State of Food and Agriculture, 2010–2011.

<sup>2</sup> The 30-month PASP model project was internally funded by CRS’ Overseas Operations Innovation Fund.

## 2.2 THE UNDERSTANDING FARMERS' NEEDS PROJECT

The Understanding Farmers' Needs (UFN) project, implemented in Senegal in parallel to the PASP model project,<sup>3</sup> sought to identify the value added for farmers from improved last-mile service delivery by PASPs through the evaluation of farmers' demand for agricultural inputs, how they financed those inputs and the role CRS SILCs can play in increasing financial resources for investment in agriculture. The UFN project built on CRS investments toward creating and measuring the value of sustainable last-mile delivery of agricultural inputs and technical assistance for farmers through the PASP model project.<sup>4</sup>

Prior to UFN, the focus of PASP business model development was on ensuring sustainability and profitability for the PASPs – not on how well they serve their clients. Little was known regarding farmer-clients' demands and the value added for them when they purchased products and services from PASPs rather than from other agro-dealers. The UFN project filled this gap by focusing learning on the needs and purchases of the smallholder farmers who engaged with PASPs.

## 2.3 THE UNDERSTANDING FARMERS' NEEDS PROJECT RESEARCH

The UFN project research enabled CRS to identify the benefits to individual farmers and farmer groups in Senegal of long-term, affordable access to high-quality agricultural inputs (including improved seeds, fertilizer and pesticides) and the delivery of appropriate agricultural technical services through the PASP model project.

To understand how well-trained PASPs meet the needs of the farmer customers they serve, the UFN project research conducted three rounds of data collection. The first round was conducted in December 2019 to learn what inputs and services the farmers interviewed planned to purchase and use. A second round was conducted in September 2020 to learn what inputs and services the farmers had purchased prior to and during the previous growing season, and from whom. Finally, an endline survey was conducted with those farmers who in September 2020 said they had bought inputs from PASPs, as well as FGDs with SILC-member PASP customers. The survey sought to determine the role SILC played in PASPs' input and service provision, if and how the inputs sold by the PASPs had affected agricultural production, and whether farmers had asked their PASP to help with their crop sales.

<sup>3</sup> The PASP model project was implemented in three countries – Guatemala, Rwanda and Senegal – while the UFN project was only implemented in Senegal.

<sup>4</sup> PASPs in the Senegal context encompass the 20 SILC-PSPs who participated in the PASP program, receiving specific business, gender and ICT4D training. The five PASPs who were targeted by the UFN project received the same business and marketing training as those in the PASP model project, except for the "Integrating Gender into PASP Services" training.

## 2.4 SUMMARY OF THE BASELINE AND MIDTERM SURVEYS

### 2.4.1 BASELINE SURVEY

The baseline survey, completed in December 2019, constituted the UFN project's first step in learning how farmers made their agricultural investment decisions, given their different financing opportunities and access to PASPs. The baseline employed a large-N, stratified random sample of farmers associated with the Cadior PASP network. Of the 177 respondents interviewed (123 women and 54 men), 73.4% (130) were SILC members, and most earned money from their SILC loans and/or share-outs. Those whose SILCs conducted a share-out in 2019 spent their accumulated savings and end of cycle profits (dividends) principally on social and religious events, food, household expenses, animals and non-agricultural income-generating activities. Most did not spend their share-out money on agricultural production. Sixty-eight respondents reported being supported by PASPs, and 91.2% (62) of these said they had received some agricultural training and technical support from their PASP in 2019. One hundred fifty-seven respondents said they planned to purchase or pay for at least one type of input in 2020 - mostly fertilizer and/or improved seeds. For these purchases, 71.8% (127) said they planned to use money from a non-agricultural income generating activity (IGA); 31.6% (56) from SILC share-out income; and 24.9% (44) planned to use money given to them by a family member. All respondents reported earning positive net income from their crop sales in 2019, and 80.5% (120) planned to sell at least some of their 2020 agricultural production. Majorities of both SILC-member and non-SILC respondents expected that the revenues from their 2020 crop sales would not cover all their household expenses for the following 12 months.

### 2.4.2 MIDTERM SURVEY

The midterm survey, completed in September 2020, interviewed 296 farmers associated with the Cadior PASP network.<sup>5</sup> Fifty-seven percent (169) were SILC members, including 94.5% (121) of women and 28.6% (48) of men. Just 16% (12) of SILC members reported investing their share-out lump sums in agriculture, and only 11.7% (15) of those who took SILC loans reported investing their loan money in agricultural production. Most of the farmers interviewed in the midterm study reported buying agricultural inputs, with 76.9% (193) of the 251 who bought at least one input buying fertilizer; 76.1% (191) buying seeds; and 16.7% (42) buying pesticide. Most farmers who bought fertilizer reported buying it from a PASP - and most sales that PASPs made involved fertilizer. Of the 193 respondents who purchased fertilizer, 76.2% (147) bought some or all of it from a PASP. However, few of the farmers who bought fertilizer from a PASP were SILC members. Overall, 149 respondents in the study had bought at least one agricultural input from a PASP.

<sup>5</sup> A significant share of those interviewed in the midterm had been interviewed at baseline.

By the time the midterm survey was carried out, the Covid-19 global pandemic had begun, and 50.7% (98) of the 193 UFN respondents who bought at least one agricultural input in 2020 said that the pandemic had negatively affected their financial capacity to buy inputs, due to the paralysis of economic activities and restrictions on travel as the country shut down to stem the spread of the virus. Respondents also noted the resulting rise in prices for necessities and lower sales prices for the farmers' crop production, which they could no longer take to market.

While at the midterm 80 farmers said they planned to sell some of their agricultural production in 2020, and most expected to earn positive net income from the sales, the study was administered before the crop sales took place. Thus, the farmers' sales experience and judgment of the quality of the PASP's input and service offerings could only be addressed in the endline study.

# 3. Endline study design and methods

## 3.1 DESIGN

The September 2020 midterm study answered questions about farmers' input and technical service purchases from PAsPs and others, as well as financing and payment methods – but it was conducted before farmers could harvest and sell their crops. The midterm study therefore did not answer questions about farmers' crop sales, including:

- the farmers' satisfaction with the quality of inputs and services they bought from the PAsP, and with the PAsP's sales support
- what share of their crops they sold
- where they sold their crops
- whether they sold their crops all at once, or across multiple sales
- how much they earned from the sales whether and how their PAsP helped them sell their crops

To answer these questions, the endline study – whose results are reported here – combined two methods:

1. A survey of the smallholder clients who told interviewers in September 2020 that they had purchased at least one input from a PAsP during the previous agricultural production season; and
2. Seven focus group discussions – six with SILC-member farmer clients, and one with the five PAsPs participating in the UFN project.



### 3.2 SAMPLING, DATA COLLECTION AND ANALYSIS

The final endline study selected the 149 smallholder farmer respondents from the September 2020 project endline survey who told the interviewer that they had bought at least one agricultural input or service from a PASP during the previous agricultural season. This purposive selection was done to ensure that the endline survey respondents could answer questions about the quality of the inputs they bought from the PASP; how they financed and paid for the inputs; if and how their production and yields changed, and why; if, and how, the PASP later helped them with crop sales; and whether they would recommend the PASP to their neighbors for input acquisition and help with agricultural sales.

The smallholder farmer survey was administered in four municipalities in the district of Thiès by independent enumerators hired and trained by the UFN project. These enumerators, who had previously administered the midterm and baseline surveys, contacted each farmer on their list, conducted the interview and recorded the respondents' responses in the CommCare app<sup>6</sup> on a tablet. The enumerators then submitted each completed form to the CommCare cloud.

When respondents from the September 2020 survey were unavailable to be interviewed, the enumerators replaced them with another PASP customer from the same village. Of the 149 September 2020 respondents sampled, 142 were found and interviewed. The seven respondents who were unavailable were replaced with new respondents.

In addition to the smallholder farmer (customer) survey, the final endline study researchers facilitated a series of FGDs with the five PASPs and 30 SILC-member smallholder farmer clients.

1. One FGD with the project PASPs. The PASP FGD was held to understand the five Cadior network PASPs' experience working with and selling to SILC members and non-SILC member smallholder farmers; their experience selling agricultural inputs and services independently compared to their prior experience as agents of myAgro;<sup>7</sup> and their experience selling inputs to farmers during the COVID-19 pandemic.
2. Six FGDs with SILC-member PASP customers. The SILC FGDs were held to understand in greater depth the SILC-member customers' experiences buying inputs and services from the PASP; their judgment of the inputs; their experience (where relevant) getting crop sales support from their PASP; and inputs and services they wish the PASP would provide in future.

The SILC-member FGDs were conducted with SILC members who had purchased agricultural inputs and/or services from their local PASP. Participants were selected in two steps. First, SILCs with members who purchased agricultural inputs from PASPs in 2020 were identified, and for each PASP, the SILC with the most members who had purchased inputs was selected. Second, the members of the selected SILC group who

<sup>6</sup> CommCare, owned and designed by Dimagi (<https://www.dimagi.com>), allows users to create mobile and web apps to collect accurate data and deliver effective services.

<sup>7</sup> myAgro (<https://www.myagro.org>) is a nonprofit organization based in West Africa that enables farmers to purchase high-quality agricultural inputs on layaway through an SMS-based platform and a network of local vendors.

had purchased agricultural inputs from the group's PASP were invited to participate in the FGD.

#### 3.3 DATA LIMITATIONS

Logistical difficulties limited the study's sample size and selection. Researchers faced Covid-19-related delays – including mandatory CRS quarantine for the researcher who traveled to Senegal from the United States and government travel restrictions in place in Senegal at the time – and the end of Ramadan approaching as field data collection commenced. For these reasons, the researchers opted to include only the 149 farmers who had participated in the midterm evaluation and bought inputs from a PASP, rather than seeking a larger sample of PASP customers who had not been interviewed in September 2020 (which would have strengthened the study's findings).

Due to time constraints for field data collection and the fact that among the SILCs associated with the Cadior PASP Network, few members of any given SILC group were PASP customers. Some of the SILC FGDs included just a few participants, and those participants' responses may not have been representative of views held by the broader population of customers across the SILCs served by the Cadior PASPs in Senegal. Upon reviewing ePASP<sup>8</sup> customer management app data prior to field data collection, the researchers had believed that each SILC had more members who were PASP customers—but while this may have been true across the other eight of nine networks in Senegal, it was not the case for the Cadior PASP Network, where an estimated average of just three members per SILC group were PASP customers.

Finally, this study was conducted among the PASPs and farmers associated with just one PASP network – Cadior – in one region of Senegal. Responses may not represent the views, attitudes and judgments of farmers in other regions of the country, who interact with PASPs in other networks.

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<sup>8</sup> ePASP is a smartphone application synced to a multi-country, centralized dashboard, which enables the PASPs and CRS and implementing partner staff to monitor key customer data, orders, payments, and cash flows, as well as performance indicators related to training, business management, and certification preparedness progress.



# 4. Results

## 4.1 CUSTOMER DEMOGRAPHICS

### 4.1.1 CUSTOMER SURVEY RESPONDENT PROFILES

The customers interviewed in the endline survey lived in the Thiès region of Senegal, in villages in the municipalities of Koul, Mbayene, Ngandiouf and Niakhene. Of the 149 customers interviewed, 142 had been interviewed in September 2020, and 7 were replacements for respondents who were not available or could not be located at the time of the survey.

Included in the sample of 149 customer respondents were 28 women and 121 men. The median age of the customers was 50 years (women 43.5, men 52), and all but three were married. The median household size was 15, and while most men said they were the household head, just 28.6% (8) women said the same. Over half the women – but under a quarter of the men – said they belonged to a producers' association. The customers' education levels varied, with most women saying they had none, primary or Quranic French-Arab educations; most men (57.9%) reported a Quranic French-Arab (Table 1) education.

TABLE 1. FARMER RESPONDENT PROFILES

	WOMEN	MEN	OVERALL
<b>Municipalities</b>			
<i>Koul</i>	5	45	50
<i>Mbayene</i>	5	20	25
<i>Ngandiouf</i>	17	35	52
<i>Niakhene</i>	1	21	22
<i>Total</i>	28	121	149
<b>Ages</b>			
<i>Median</i>	43.5	52	50
<i>Inter-quartile range (IQR)</i>	30–50	43–65	42–65
<b>Married</b>	26	120	146
<b>Household head</b>	8	107	115
<b>Household size</b>			
<i>Median</i>	43.5	52	50
<i>Inter-quartile range (IQR)<sup>9</sup></i>	30–50	43–65	42–65
<b>Interviewed in September 2020</b>	25	117	142
<b>Member of a producers' association</b>	16	29	45
<b>Education level</b>			
None	9	11	20
Primary	5	21	26
Middle School	1	4	5
High School	0	9	9
University – not completed	0	3	3
University – completed	0	3	3
Quranic or French-Arab	6	70	76
Adult literacy classes	7	0	7

<sup>9</sup> IQR is a measure of spread of a data distribution that shows the 1st quartile (25th percentile)–3rd quartile (75th percentile).

#### 4.1.2 FOCUS GROUP DISCUSSION PROFILES

Across the six SILC FGDs, 30 members – 19 women and 11 men – who had purchased fertilizer or seeds from their local PASP in 2020 were interviewed. For four of the five participating PASPs, members of one SILC were invited to participate in the FGD. For the fifth PASP, whose SILCs had a greater number of members who had bought inputs from the PASP in 2020, two SILC FGDs were conducted.

All five PASPs participating in the UFN project were present for the PASP FGD (Table 2). These PASPs are all SILC Private Service Providers (PSP) who are members of the Cadior PSP network, one of nine legally registered<sup>10</sup> SILC PSP networks operating across Senegal.

TABLE 2. FGD PARTICIPANT PROFILES

FGD	TYPE	N WOMEN	N MEN	SILC NAME
1	PASP	1	4	--
2	SILC	6	6	Manko
3	SILC	2	0	Bok Yakar
4	SILC	2	1	Sophy Mame Diarra
5	SILC	0	2	Sopey Serigne Fallou
6	SILC	2	1	Sope Sidy Ahamed
7	SILC	7	1	Mboubéne
TOTAL SILC PARTICIPANTS		19	11	

#### 4.1.3 SURVEY RESPONDENTS' CROP PRODUCTION

Overall, the customers interviewed in the survey planted between 1–600 hectares of land in 2020; the median customer planted 6 hectares (IQR 3–10 hectares). Non-SILC customers planted on average more land than SILC members: median 7.5 hectares (IQR 5–10.3 hectares) versus 4 ha (IQR 2–7), respectively. Due to their greater access to land, men planted larger areas (median 7 hectares) than women (median 2 hectares) (Table 3).

TABLE 3. SURFACE PLANTED (HECTARES)

STATISTIC	OVERALL	MEN	WOMEN	SILC	NON-SILC	THE 16 CUSTOMERS WHO GOT PASP HELP WITH CROP SALES
Minimum	1	1	1	1	1	1
Median	6	7	2	4	7.5	2
Mean	11.3	13.1	3.2	5.6	16.7	3.8
IQR	3–10	5–10	1–3.3	2–7	5–10.3	2–3
Maximum	600	600	13	30	600	20

<sup>10</sup> The Cadior network, like the other eight PSP networks, is registered as a G.I.E. (groupement d'intérêt économique) under Senegalese law.

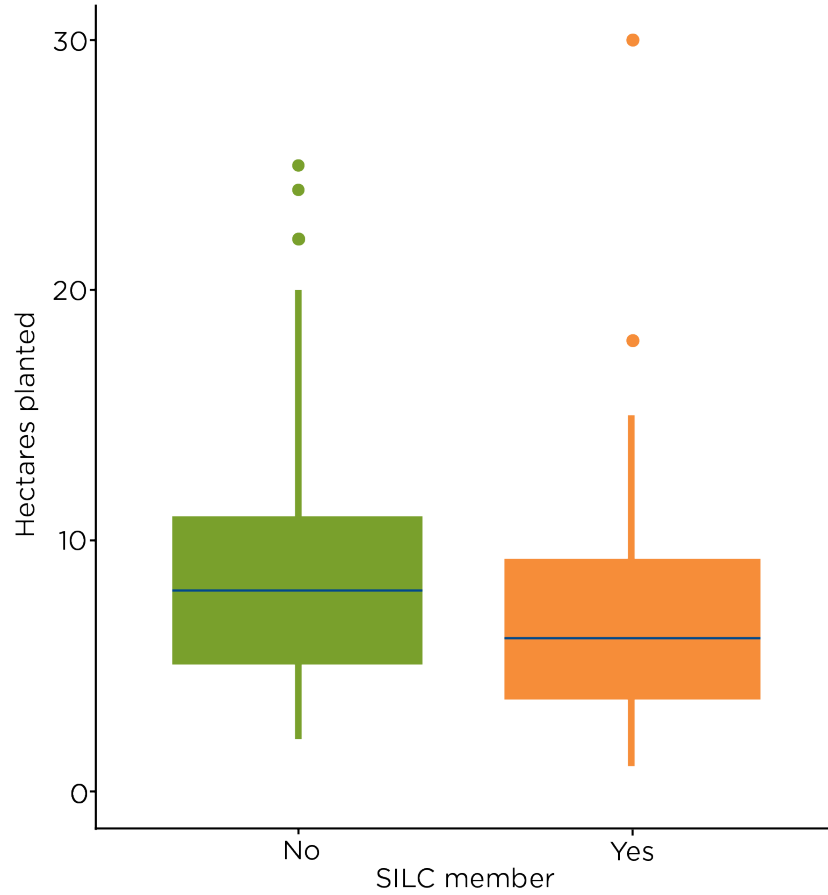
Given that the 28 women in the sample had planted less land than men, the question is whether respondent sex confounds the relationship between SILC membership and land area planted. It does not: the key difference in land planted relates to respondent sex, not SILC membership, because most farmland is owned and worked by men.

To test whether SILC or respondent sex exerts greater influence on land area planted statistics, we looked at the subsample of men, to compare land area between SILC members and non-SILC survey respondents. Table 4 compares those men who belong to at least one SILC group (n=48) to those who are not SILC members (n=73). The median area planted by men in SILC was 6 hectares (IQR 3.8–9.3 hectares), while the median for non-SILC men was 8 hectares (IQR 5–11 hectares). However, as the Figure 1 box-and-whisker plot illustrates, these differences are minimal and statistically insignificant: respondent sex is more strongly associated with land area planted than SILC membership is.

TABLE 4. HECTARES PLANTED, MEN (N=121)

STATISTIC	NON-SILC MEN (N=73)	MEN IN SILC (N=48)	MEN OVERALL (N=121)
Minimum	2	1	1
Median	8	6	7
Mean	17.2	6.9	13.1
IQR	5–11	3.8–9.3	5–10
Max	600	30	600

Figure 1. Hectares planted x SILC membership, men (boxplot) (zoomed in, so does not show non-SILC outlier of 600 hectares planted)



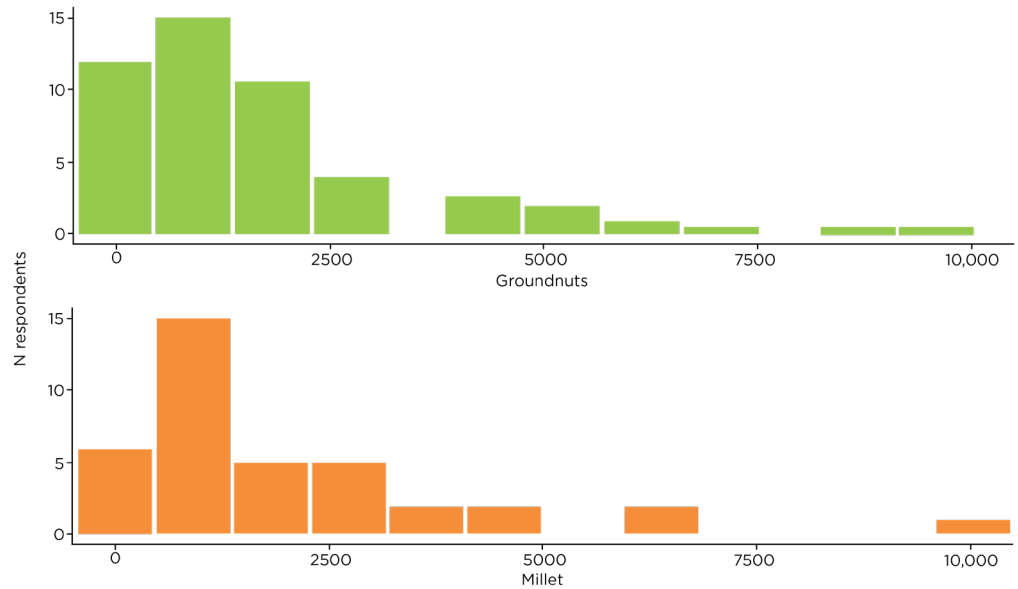
The main crops grown by the customers interviewed were groundnuts and millet – and most customers cultivated both crops. Of the 149 respondents, 98.7% (147) grew groundnuts and 91.3% (136) grew millet. Of the 16 respondents who requested PASP help with sales, 93.8% (15) grew groundnuts and 6.7% (1) grew millet as their main crop. Of those 15 who grew groundnuts as their main crop, 86.7% (13) grew millet as a second crop (Table 5). Twelve customers grew the first crop individually, three grew it collectively and one cultivated both a personal plot and a share in a collective plot.

TABLE 5. MAIN CROPS (CUSTOMERS)

MAIN CROP	SECOND CROP				TOTAL
	GROUNDNUTS	COWPEAS	MILLET	NONE	
Groundnuts	3	3	98	6	110
Manioc	1	0	0	0	1
Millet	36	1	1	0	38
Total	40	4	99	6	149

Production of each main crop ranged from 0 (not produced) to 10,050 kilograms (kg) and, in general, non-SILC customers cultivated greater quantities than SILC members did. Production of millet ranged from 12 to 10,050 kg. The median non-SILC customer produced 1,500 kg of millet (IQR 700–3,000 kg), while the median SILC customer produced just 600 kg (IQR 300–1,350 kg). Differences between SILC and non-SILC customers were less stark with respect to groundnuts: production ranged from 0 (not produced) to 9,600 kg,<sup>11</sup> with the median non-SILC customer producing 1,200 kg (IQR 500–2,000 kg) and the median SILC customer producing 1,000 kg (IQR 475–2,000 kg). Figure 2 visualizes the distribution respondents by kilograms of main crop produced.

Figure 2. Agricultural production (kg) by main crop



<sup>11</sup> These statistics eliminate an implausible outlier respondent, who reported producing 30,000 kg of groundnuts.

#### 4.1.4 SURVEY RESPONDENTS' SILC MEMBERSHIP

The customer survey sample was relatively balanced between SILC and non-SILC respondents: 49% (73) of respondents belonged to at least one SILC, while 51% (76) did not. Most women customers (92%, or 23 of 28) were SILC members, while only a minority of men (39.7%, or 46 of 121) were (Table 6).

TABLE 6. SILC MEMBERSHIP

NUMBER OF GROUPS TO WHICH CUSTOMER BELONGS	N	WOMEN	MEN
0	76	3	73
1	69	23	46
2	3	2	1
More than 2	1	0	1
Total customers in SILC	73	25	48

Of the 73 customers in the sample who belonged to at least one SILC, 95.9% (70) stated that they had participated in at least one SILC share-out in 2020 (Table 7).

TABLE 7. RECEIVED SILC SHARE-OUT MONEY IN 2020

STATISTIC	N	PERCENT
No	3	4.1
Yes	70	95.9
Total	73	100

Pluralities of SILC members belonged to groups that conducted share-outs in February 2020 (n=20 respondents) and May 2020 (n=12 respondents), and 15 reported receiving share-outs in June 2020 or July 2020. Most customers received their share-outs before August 2020: just 16 customers reported receiving SILC share-outs in August 2020, September 2020 or December 2020 (Table 8).



TABLE 8. MONTH OF SILC SHARE-OUT (2020)

MONTH	N	OF N=41 WHO PAID FOR INPUTS WITH SILC SHARE-OUT MONEY	OF N=25 WHOSE SILC SHARE-OUTS WERE TIMED WITH AGRICULTURAL CYCLE
January	7	2	3
February	20	14	3
March	7	4	0
April	1	1	1
May	12	12	6
June	8	3	5
July	7	6	1
August	3	0	3
September	4	1	3
October	0	0	0
November	0	0	0
December	5	1	1
Total	74*	44*	26*

\*At least one respondent reported more than one SILC share-out

## 4.2 INPUT PURCHASES

The most common agricultural input purchased from PASPs was fertilizer. All but one respondent bought fertilizer (n=148), and of the 148 who bought fertilizer, 82.4% (122) bought DAP; 41.2% (61) bought NPK 15 15 15; and 8.8% (13) bought NPK 10 20 10.<sup>12</sup> Few respondents, in contrast, bought seeds. Just 5 bought millet seeds from PASPs, and one each bought groundnuts and hibiscus seeds (Table 9).

<sup>12</sup> DAP is Diammonium Phosphate, and NPK is Nitrogen-Phosphorus-Potassium.

TABLE 9. CUSTOMER PURCHASES FROM PASP

INPUTS PURCHASED	N (ALL)	N (SILC MEMBERS)
Fertilizer	148	72
Seeds	7	6
Pesticides	1	1
Other	1	1
Labor (training and technical advice)	36	14
FERTILIZER PURCHASED	N (ALL)	N (SILC MEMBERS)
DAP	122	59
NPK 15 15 15	61	29
NPK 10 20 10	13	7
SEEDS PURCHASED	N (ALL)	N (SILC MEMBERS)
Millet	5	4
Groundnuts	1	1
Hibiscus	1	1
Total customers in SILC	73	25



NPK fertilizer bulk delivery to a PASP network.  
[Photo by Sémou Guèye for CRS]

Indeed, in their FGD, the PAsPs told the FGD facilitators that they had sold just two types of inputs in 2020: fertilizer types for millet, groundnuts and maize, and certified millet seeds. Of these inputs, fertilizer sales contributed the most to the PAsPs' revenues.

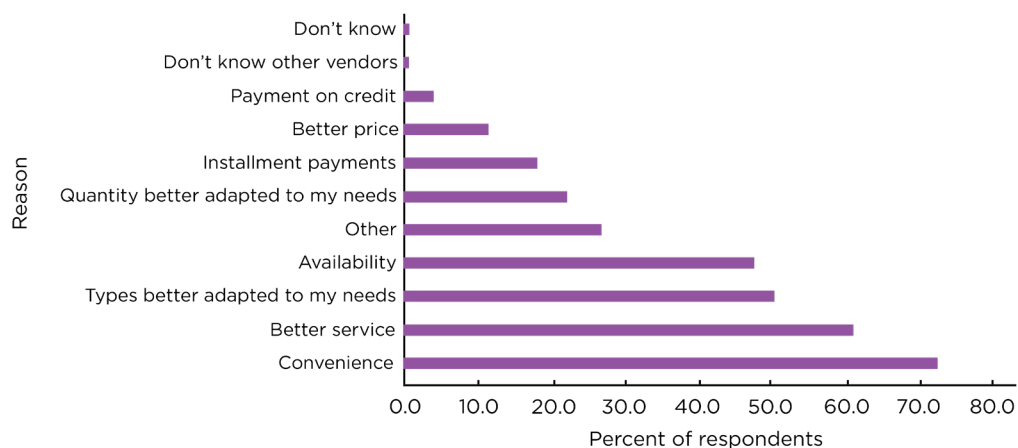
The customers interviewed gave various reasons for buying agricultural inputs from their PASP. Most members of the full sample and the SILC-member subset said that buying from the PASP was convenient (72.5% of the full sample, 68.5% of the SILC subset). Most customers in the full sample, and a plurality in the SILC-member subset, said that the PASP provided better service than other vendors (61.1% of the full sample, 47.9% of the SILC subset). About half thought that the types of inputs sold by the PASPs were better adapted to their needs than those sold by other vendors (50.3% of the full sample, 49.3% of the SILC subset). Indeed, several respondents told the interviewers that the fertilizer sold by the PASPs was of better quality than the subsidized fertilizer sold by the local cooperative. Finally, a large minority cited the PASP's availability (47.7% of the full sample, 45.2% of the SILC subset) (Table 10 and Figure 3).

In contrast, though one of the goals of the PASP model is to provide high-quality inputs at competitive prices, just 11.4% of the full sample (and 15.1% of the SILC-member subset) said that the PASPs offered better prices than other vendors.

TABLE 10. REASONS RESPONDENTS BOUGHT FROM PASP

RESPONSE	N	%	N SILC	% SILC
Convenience	108	72.5	50	68.5
Better service	91	61.1	35	47.9
Types better adapted to my needs	75	50.3	36	49.3
Availability	71	47.7	33	45.2
Other	40	26.8	22	30.1
Quantities better adapted to my needs	33	22.1	22	30.1
Installment payments	27	18.1	17	23.3
Better price	17	11.4	11	15.1
Purchase on credit	6	4.0	1	1.4
Don't know other vendors	1	0.7	1	1.4
Don't know	1	0.7	1	1.4

Figure 3. Reasons given for buying from a PASP (full customer sample)



While all the customers interviewed in the customer survey had been sampled because they bought inputs from a PASP, several of them also bought inputs from non-PASP vendors. Of the 148 customers who answered the question, 48.6% (72) said that they had bought inputs from a non-PASP vendor – including 41.1% (30) of SILC members.

Of those who had bought inputs from a non-PASP vendor, 97.2% (96.7% of SILC members) bought fertilizer, and 20.8% (16.7% of SILC members) bought seeds (Table 11). Presumably, the fertilizer and seeds that the PASP customers bought from non-PASP vendors in 2020 were of different types from those provided by the PASP – with respect to fertilizer, probably Urea; and with respect to seeds, possibly certified groundnuts and/or garden vegetables – but the survey did not ask for elaboration. Several SILC FGD participants, however, expressed a desire for certified groundnut seeds, which were not available from PASPs. Helping PASPs access certified groundnut seeds to sell to their customers might lead to greater fertilizer sales, as providing farmers with convenient access to affordable, certified groundnut seeds will likely increase their demand for fertilizer.

TABLE 11. PURCHASES FROM OTHER VENDORS

	N (% OF 148)	N SILC (% OF 73)
Bought from other vendors	72 (48.6)	30 (41.1)
If bought from other vendors, which inputs?		
	N (% OF 72)	N SILC (% OF 30)
Fertilizer	70 (97.2)	29 (96.7)
Seeds	15 (20.8)	5 (16.7)

### 4.3 SOURCES OF CASH FOR PURCHASES AND TERMS FOR PAYMENT

#### 4.3.1 CUSTOMERS' MONEY SOURCES AND TERMS FOR PAYMENT

Non-agricultural IGAs and SILC share-outs were the most common sources of money for agricultural input purchases. To pay for their inputs, most non-SILC customers interviewed in the survey used money from a non-agricultural IGA (36 SILC members, 55 non-SILC customers). Among SILC members, 41 used their SILC share-out money for input purchases, while just seven took a loan from their SILC group's main fund (Table 12).<sup>13</sup>

TABLE 12. CUSTOMERS' CASH SOURCES

RESPONSE	N (SILC)	N (NON-SILC)
SILC share-out	41	--
SILC loan from main fund	7	--
Money from SILC third fund for agricultural inputs	2	1
Non-ag IGA	36	55
Non-SILC loan	1	3
Other	12	10

For some customers, the timing of their SILC's share-out facilitated using the share-out lump sum for input purchases. Of the 70 SILC members who received share-out funds in 2020, 35.7% (25) reported that their group's share-out was timed with the agricultural cycle; 12 (members of an estimated 11 SILC groups) reported that their group's share-out was timed with the need to buy agricultural inputs; and 13 (members of an estimated 8 SILC groups) reported that their share-out was timed with the harvest (Table 13).

TABLE 13. SILC SHARE-OUT TIMING WITH AGRICULTURAL CYCLE (N=70 RESPONDENTS WHO RECEIVED SHARE-OUT)

SHARE-OUT TIMED WITH...	N (RESPONDENTS)	N (SILC GROUPS) <sup>14</sup>
Input purchases	12	11
Harvest	13	8
Not timed	45	36
<i>Total</i>	70	55

<sup>13</sup> Irrespective of source of money, eight SILC members and 23 non-SILC survey respondents reported withdrawing money from a mobile money account to pay for their agricultural inputs.

<sup>14</sup> Some spelling inconsistencies in SILC group names, as well as interviewees who did not recall or report the name of their SILC group, render this column's values educated guesses.

While most SILC share-outs were not timed with agricultural input purchases (n=45 respondents, members of an estimated 36 SILC groups), some SILC members retained their share-out lump sum (or at least a part of it) to buy inputs later. The two female participants of the Sopey Mame Diarra SILC FGD said they had saved the money from their August 2019 share-out to pay for fertilizer in July 2020 – eleven months later.<sup>15</sup>

FGD participants' responses regarding money sources for input purchases differed slightly from the survey results and provided a clearer picture of how customers combined money from different sources. In the FGD with members of SILC Sopey Serigne Fallou, one man said that he had taken a SILC loan to buy his inputs and supplemented the loan with IGA earnings; the other male SILC Sopey Serigne Fallou participant said that he had just used income from his masonry work. In contrast, in the SILC Soukhali Mboubéne FGD, all eight participants said they had taken SILC loans to pay for their inputs, while none had used the SILC share-out lump sum.

To pay for inputs, the customers had some options. First, customers could prepay for the inputs in one lump sum or in regular installments. Second, customers could pay for their inputs on delivery. Third, customers could take non-SILC loans to pay for inputs and repay those loans in installments or in one lump sum.

Most of those who bought from a PASP, whether SILC or non-SILC customers, paid the PASP for their inputs on delivery (76) or prepaid in one bulk payment or in installments (67) (Table 14). According to the PASPs in their FGD, some customers paid in advance. But due to COVID-19, the PASPs gave their customers some flexibility to complete their payments up to three months after the inputs were delivered. Five customers said they had received (non-SILC) credit for their purchases; one repaid in installments, and the other four in one lump sum.

TABLE 14. RESPONDENTS' TERMS FOR PAYMENT

MEANS	N (ALL RESPONDENTS)	N (SILC MEMBERS)
Prepayment (in advance)	67	37
Cash payment on delivery	76	35
Credit: repaid in installments	1	0
Credit: repaid in one lump sum	4	0
<i>Total</i>	<i>148</i>	<i>72</i>

All input payments were individual, and no inputs were paid for collectively by SILC groups. While SILC group payments may have been feasible in some cases, the research team learned that most SILC groups had few members who bought inputs from a PASP, so group payments did not happen. Per the PASPs in their FGD, all customer payments were individual, and most SILC groups did not have a third fund

<sup>15</sup> The FGD interviewers were initially skeptical of the women's explanation, but the women confirmed their statement when asked probing questions about the extended time between share-out and input payments. In short, the women appear to have received their SILC share-out lump sum and saved at least some of the cash until it was needed for input purchases.

for inputs in SILC because so few members of each SILC were customers. In fact, just 8.2% (6) of the 73 SILC-member respondents to the customer survey said that their SILC had a third fund for input purchases.<sup>16</sup>

The PASPs added that in 2021, they would encourage all their customers to pay in advance in installments – over the course of about five months – and would not offer credit to their customers.

#### 4.3.2 PASPS' MONEY SOURCES TO BUY FERTILIZER AND CERTIFIED SEEDS WHOLESALE

To sell inputs to their customers, the PASPs had to acquire them from manufacturers or wholesalers. The PASPs met their customers' demand for fertilizer by coordinating on a bulk order involving all nine of the country's SILC PSP networks, while each PSP network ordered seeds on its own. The PASPs told their FGD facilitators that they saw advantages to this approach and would continue to place a bulk order for fertilizer in the future, "Because the grouped order for fertilizers from the nine PSP networks gave the best advantages and prices. So, the PSP apex network of networks will continue to make consolidated orders."

The PASP networks paid for the fertilizer in 2020 using a form of trade credit: a facility to repay the value of the inputs in 60 days same as cash, with no interest rate or additional charges. To repay the supplier, the PASPs collected part of the input costs from customers in prepayment, but they did not pay the wholesalers the entire amount before the inputs were delivered. In contrast, the PASPs paid for certified seeds in cash before delivery.

The PASPs interviewed said they planned to move to all-cash transactions in 2021 and eschew credit to customers. One PASP FGD participant said that he would do so because "It's easier." Indeed, some farmer customers failed to repay the credit their PASPs had extended to them and the PASPs in the two networks that participated in the PASP model project encountered some challenges related to repaying their own bank credit in 2020.

### 4.4 CUSTOMERS AND CUSTOMER CONVERSION

#### 4.4.1 GENDER, SILC AND CUSTOMERS

While about half of the customer survey respondents in the 2021 endline study were SILC members, PASPs have many more customers than those interviewed in the study – and SILC members may have been overrepresented in the survey sample. Per the PASPs in their FGD, very few of their customers were SILC members – and most were not. Because most of their customers were not SILC members, the PASPs said they earned more money from non-SILC customers than from SILC customers.

Because most SILC members were women and few of them had access to land to cultivate that would require using fertilizer or certified seeds, the PASPs had fewer inputs to offer SILC members. Household gender dynamics also affected the PASPs' customer base. Per the PASPs in their FGD, women in their communities cannot

<sup>16</sup> Analysis of these SILC members' villages and group names indicates that just six SILCs whose members were in the customer survey sample had third funds dedicated to agricultural input purchases.



make decisions without their husbands' consent. The agriculture in the zone of study, according to the PASPs, is done by the men – and few of them were in SILC. Only a few older women had sufficient land to farm and would buy from the PASP. Finally, not all the study zone is good for agriculture – and the areas less conducive to farming are those with more SILCs.<sup>17</sup>

#### 4.4.2 NEW AND REPEAT CUSTOMERS

Most respondents to the customer survey had decided to buy inputs from their PASP for the first time in 2020, and the rest were repeat customers. Over half (55.7%) of respondents reported that 2020 was the first time they had bought inputs from their PASP – including 42.5% (31) of SILC members and 68.4% (52) of non-SILC respondents.

Of these, 41% (34) reported that their first-time purchase from a PASP was the first time they had bought the input(s) in question, from any source. These customers include 51.6% (16) of SILC members who had bought from a PASP for the first time, and 34.6% (18) of non-SILC respondents. Just under half of the customers interviewed – 44.3% (66) – were buying from the PASP for at least the second time, indicating a repeat customer (Table 15).

TABLE 15. NEW AND REPEAT PASP CUSTOMERS

FIRST TIME BUYING THESE INPUTS FROM A PASP?						
RESPONSE	N (ALL)	% (ALL)	N (SILC)	% (SILC)	N (NON-SILC)	% (NON-SILC)
Yes	83	55.7	31	42.5	52	68.4
No	66	44.3	42	57.5	24	31.6
Total	149	100	73	100	76	100
FIRST TIME BUYING THESE INPUTS FROM ANY SOURCE? (OF N=83 WHO BOUGHT FOR FIRST TIME FROM PASP)						
Yes	34	41.0	16	51.6	18	34.6
No	49	59.0	15	48.4	34	65.4
Total	83	100	31	100	52	100

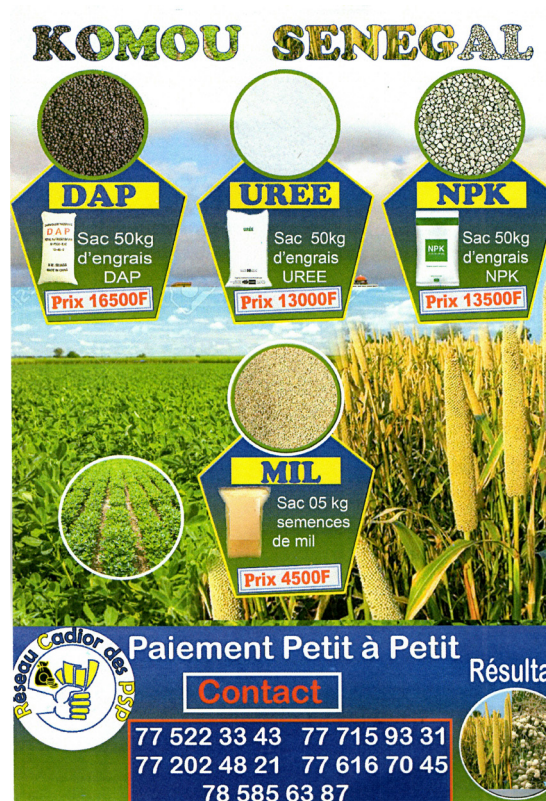
<sup>17</sup> However, the PASPs said that they made efforts to meet the husbands of women in SILC, who wanted to help their wives improve their production by purchasing the proper fertilizer for them. If this is the case, some PASPs may have engaged indirectly with women customers, via their husbands.

While PASPs reached those smallholder farmers who had never bought fertilizer or certified seeds before, they also convinced other farmers either (a) to buy from them rather than a competitor or (b) to buy from them in addition to buying from a competitor. Of those farmers who bought from the PASP for the first time in 2020, 59% (49) had purchased those inputs previously from another source before, indicating either that they converted – changed vendors – to the PASP, or that they bought from the PASP in addition to buying from a non-PASP vendor.

- Of the 83 customers interviewed who bought from a PASP for the first time in 2020, 53% (44) also bought inputs from another, non-PASP vendor.
- Of the 66 customers who were buying from a PASP for at least the second time in 2020, 42% (28) also bought inputs from another vendor.
- Of the 49 customers who bought from a PASP for the first time in 2020, and had bought these inputs before, 65.3% (32) also bought inputs from another vendor in 2020.

## 4.5 BUYING FROM PASPS: MARKETING, TECHNICAL ADVICE AND AVAILABILITY

### 4.5.1 MARKETING



PASP input marketing flyer. [Credit: Cadior PASP Network]

To market their inputs and services, the PASPs undertook a coordinated campaign. First, they produced a professionally designed flyer to distribute to communities. Second, they participated in a radio program to spread the word about their offerings and held awareness meetings for producers in villages – both SILC and non-SILC farmers – where they distributed their flyers. They provided information on prices and terms for payment, including the option to pay in installments over five months, starting in January 2020 or February 2020.

The PASPs said their marketing strategy worked despite restrictions on travel and meetings due to COVID-19. They expressed hope that they could do even better marketing in 2021 with some word-of-mouth advertising between producers themselves. In their FGD, the PASPs told the FGD facilitators that “At the moment, we are doing the same type of marketing for 2021. We think that our customers had good yields in 2020, and so will tell other producers to buy for us.”

#### 4.5.2 PASPS' TECHNICAL ADVICE AND AVAILABILITY DURING THE PURCHASING PROCESS

As part of the PASPs' training and practice, they were expected to consult with their customers regarding the most appropriate types and quantities of fertilizer and seeds for their customers' crops and land area, and to provide technical advice on input use upon delivery. In their FGD, the PASPs said that they always discussed with their customers what to order. Per one PASP, "For anyone who comes in to order, we go over the options to make sure it's the right choice." Per another, "Depending on the [input] prices and quantities, we give them instructions (types of fertilizer in relation to crops) and, above all, remind them that they have to pay in advance or there will be no delivery."

Almost all customers surveyed (95.3%) said their PASP had explained how to use the inputs upon delivery. But when asked if the PASPs discussed their specific crop needs while they were ordering inputs, or whether the PASPs just took their order, the customers interviewed split. Just 53.4% (79) said that the PASP had discussed their needs with them (Table 16) at the time he or she took their order.

TABLE 16. PASPS' ADVICE ON WHAT TO BUY AND EXPLANATIONS ON USE UPON DELIVERY

PASP ADVICE ON INPUT PURCHASES				
RESPONSE	N (ALL)	% (ALL)	N (SILC)	% (SILC)
Discussed my needs with me	79	53.4	44	61.1
Just sold me what I asked for	69	46.6	28	38.9
<i>Total</i>	<i>148</i>	<i>100</i>	<i>72</i>	<i>100</i>
PASP EXPLAINED HOW TO USE THE INPUTS UPON DELIVERY				
Yes	142	95.3	70	95.9
No	6	4.0	3	4.1
Don't recall	1	0.7	0	0.0
<i>Total</i>	<i>149</i>	<i>100</i>	<i>73</i>	<i>100</i>

Almost all customers surveyed (98.7%) – including all SILC-member customers – said that the PASP was available throughout the buying process. And all (100%) said they were at least satisfied with the input delivery, with 57% saying they were very satisfied. Nobody expressed dissatisfaction (Table 17).

TABLE 17. PURCHASING PROCESS AND DELIVERY

WAS THE PASP AVAILABLE THROUGHOUT THE BUYING PROCESS?				
RESPONSE	N (ALL)	% (ALL)	N (SILC)	% (SILC)
Yes	147	98	73	100
Sometimes	1	1	0	0
No	1	1	0	0
<i>Total</i>	<i>149</i>	<i>100</i>	<i>73</i>	<i>100</i>
HOW SATISFIED WERE YOU WITH THE INPUT DELIVERY?				
Very satisfied	85	57	52	71
Satisfied	64	43	21	29
Not satisfied	0	0	0	0.0
<i>Total</i>	<i>149</i>	<i>100</i>	<i>73</i>	<i>100</i>

#### 4.5.3 COVID-19 EFFECTS ON PASPS' SALES AND CUSTOMERS' PURCHASES

The COVID-19 pandemic's effects are reflected better in the customer survey data than in the PASP FGD. While 51.7% of customers surveyed said that their ability to buy inputs had been very affected by the pandemic (Table 18), the PASPs posted a better sales year than they had in 2019, when they worked for myAgro. The PASPs said that at the beginning of the pandemic they were afraid that their input sales would not be good due to COVID-19 restrictions, but they ended up selling much more in 2020 than they had in 2019 with myAgro, "especially since the quality [of the inputs] was better."

Table 18. Covid-19 effects on customers' ability to buy inputs

RESPONSE	N (ALL)	% (ALL)	N (SILC)	% (SILC)
Not very affected	10	6.7	4	5.5
Moderately affected	49	32.9	23	31.5
Very affected	77	51.7	44	60.3
NA	13	8.7	2	2.7
<i>Total</i>	<i>149</i>	<i>100</i>	<i>73</i>	<i>100</i>

Covid-19's effects on customers' ability to buy inputs were not significantly associated with the amount of land customers planted in 2020. The median farmer who was "not very" affected by Covid-19 planted more hectares of land than those who said they had been "moderately" or "very" affected, but the IQRs overlap considerably across categories, indicating that differences in hectares planted are not significantly associated with Covid-19's effects on customers' input purchasing power (Table 19).

TABLE 19. COVID-19'S EFFECTS BY HECTARES PLANTED (N=136 RESPONDENTS)

HECTARES PLANTED	NOT VERY AFFECTED	MODERATELY AFFECTED	VERY AFFECTED
Minimum	3	1	1
Median	9	5	6
Mean	10.2	18.8	7
IQR	6-12.8	4-8	3-10
Maximum	25	600	30

For the PASPs' customers, common effects of Covid-19 included ceased IGAs and lack of work due to lockdowns and market closures. Per one customer surveyed, "The closure of markets and transport impacted my activities." Another said that "Commercial activities have stopped." A third said that they had been affected by "lack of market and limited public transport and merchandise."

Several customers suffered income shocks due to reduced revenues. Representative statements from the customer survey respondents included "Revenues are lower" and "Revenues have diminished because the IGAs have slowed." Reduced savings was another complaint, with representative statements from customers including "I saved less money [this year] to buy inputs," "I have saved too little money to buy inputs" and "I didn't have enough money to buy fertilizer because my income-generating activity was no longer working."

Some customers suffered reduced financial support and monetary transfers in their families. Representative customer survey statements included "It's my husband who gives me money, in general, and during COVID-19 his revenues have been reduced" and "It's my children who give me money and COVID-19 has affected them, so they're late in giving me money." Another customer noted that "The [remittances] that I received have completely dropped."

Finally, some customers reduced their crop production due to the pandemic and associated financial hardships. According to one customer, "I had planned to cultivate more [crops], but I could not."

## 4.6 AGRICULTURAL PRODUCTION

### 4.6.1 CHANGES IN AGRICULTURAL PRODUCTION SINCE LAST SEASON

While the COVID-19 pandemic caused financial hardships for many customers, and forced some to cut their production, production increased or remained the same for 55% of respondents in 2020 compared to the previous growing season - including for 58.9% of SILC members. Production decreased for 45% (67), including 41.1% (30) SILC members.

Customers surveyed cited multiple factors to explain production changes. Several respondents attributed their increase simply to “better harvest,” while 18 credited the fertilizer sold to them by the PASP. Conversely, those whose harvest decreased generally blamed low-quality groundnut seeds, insects (pests), flooding (e.g., “A lot of water in our fields”), abnormal rains and God’s will.

#### 4.6.2 CUSTOMERS’ PERCEPTION OF THE QUALITY OF INPUTS SOLD BY PASPS

Although many customer survey respondents did not attribute their production changes (positive or negative) compared to the previous season to the inputs sold to them by the PASPs, most respondents (95.3%, or 142) said they would recommend their PASP to a neighbor seeking high-quality agricultural inputs (Table 20).

TABLE 20. WOULD RECOMMEND PASP TO A NEIGHBOR FOR HIGH-QUALITY INPUTS

RESPONSE	N (ALL)	N (SILC)	N (NON-SILC)
Yes	142	70	72
No	2	0	2
Uncertain	5	3	2
<i>Total</i>	<i>149</i>	<i>73</i>	<i>76</i>

#### 4.7 CROP SALES

Almost three-quarters of the customer survey respondents sold at least some share of their crops in 2020. Since millet was grown exclusively for home consumption, those farmers who sold crops, sold groundnuts. Of those who sold at least some share of their crops, 60% sold more than half and 20% said that they sold all of it (Table 21).

TABLE 21. CUSTOMERS’ AGRICULTURAL SALES

DID YOU SELL A SHARE OF YOUR PRODUCTION?						
RESPONSE	N (ALL)	% (ALL)	N (SILC)	% (SILC)	N (NON-SILC)	% (NON-SILC)
No	39	26.2	20	27.4	19	25
Yes	110	73.8	53	72.6	57	75
<i>Total</i>	<i>149</i>	<i>100</i>	<i>73</i>	<i>100</i>	<i>76</i>	<i>100</i>
IF YES, WHAT SHARE OF YOUR PRODUCTION DID YOU SELL?						
Less than half	12	11	4	7.5	8	14
Half	10	9	6	11.3	4	7
More than half	66	60	32	60.4	34	60
All	22	20	11	20.8	11	19
<i>Total</i>	<i>110</i>	<i>100</i>	<i>53</i>	<i>100</i>	<i>57</i>	<i>100</i>

Most (77%) of the customers surveyed who sold at least some of their agricultural production in 2020, sold it in a local or municipal market. A few (3%) sold it to a contracted buyer or family (Table 22).

TABLE 22. WHERE CUSTOMERS SURVEYED SOLD THEIR CROPS IN 2020

RESPONSE	N (ALL)	% (ALL)	N (SILC)	% (SILC)
Village or municipal market	85	77	31	58
Contracted buyer	3	2	0	0
Family	1	1	1	2
Other	22	20	21	40
<i>Total</i>	<i>110</i>	<i>100</i>	<i>53</i>	<i>100</i>

Most customers surveyed who sold crops (71, or 64%), sold all their production in one sale. December 2020 and January 2021, February 2021 and March 2021 were the months in which most crop sales took place (Table 23).

TABLE 23. CROP SALE DETAILS AND MONTHS

SOLD ALL AT ONCE, OR IN MULTIPLE SALES?				
RESPONSE	N (ALL)	% (ALL)	N (SILC)	% (SILC)
All at once	71	64	40	75
Multiple sales	37	34	13	25
NA	2	2	0	0
<i>Total</i>	<i>110</i>	<i>100</i>	<i>53</i>	<i>100</i>
MONTH(S) OF SALES				
RESPONSE	N (ALL)	N (SILC)	N (NON-SILC)	N (OF THE 37 WHO CONDUCTED MULTIPLE SALES)
September 2020	0	0	0	0
October 2020	1	0	1	0
November 2020	4	1	3	2
December 2020	20	8	12	4
January 2021	48	22	26	17
February 2021	38	20	18	18
March 2021	17	6	11	14
April 2021	7	2	5	7
May 2021	8	5	3	8

4. RESULTS

The most common months for sales were similar for those who engaged in multiple crop sales (Table 24) and for those who sold their crops all at once, in one sale (Table 25). For those who conducted multiple sales, January 2021–March 2021 was the most common period, followed by April 2021–May 2021. Seventeen customer survey respondents conducted crop sales in two different months, and eight in three different months. For those who engaged in just one crop sale, January 2021 was the most common month, followed by February 2021 and December 2020.

TABLE 24. MONTH COMBINATIONS OF CROP SALES (N=37 CUSTOMERS WHO CONDUCTED MULTIPLE SALES)

NOV. 2020	DEC. 2020	JAN. 2021	FEB. 2021	MAR. 2021	APR. 2021	MAY 2021	N
		X	X				6
		X	X	X			6
						X	4
					X	X	4
			X				3
	X						2
				X			2
		X		X			2
			X	X			2
				X	X		2
X							1
	X	X					1
	X	X	X				1
X		X			X		1

TABLE 25. MONTH OF CROP SALES (N=85 CUSTOMERS WHO CONDUCTED JUST ONE SALE)

OCT. 2020	NOV. 2020	DEC. 2020	JAN. 2021	FEB. 2021	MAR. 2021	APR. 2021	MAY 2021	N
			X					31
				X				23
		X						18
					X			5
							X	4
	X							3
X								1



Most customers who sold their crops earned over 100,000 Franc CFA (FCFA) from their sale(s): 80% (88) earned over 100,000 FCFA, while 13.7% (15) earned 51,000–100,000 FCFA from their sales. Over 85% (94) of customers said they had earned positive net income from their crop sales in 2020 (Table 26), but 88.2% (97) reported that their crop sale revenues were not sufficient to cover all their household expenses for the year (Table 27).

TABLE 26. EARNINGS FROM CROP SALES

MONEY EARNED FROM CROP SALES						
RESPONSE	N (ALL)	% (ALL)	N (SILC)	% (SILC)	N (NON-SILC)	% (NON-SILC)
1–25,000	2	1.8	1	1.9	1	2
26,000–50,000	5	4.5	4	7.5	1	2
51,000–75,000	8	7.3	4	7.5	4	7
76,000–100,000	7	6.4	3	5.7	4	7
>100,000	88	80.0	41	77.4	47	82
<i>Total</i>	<i>110</i>	<i>100</i>	<i>53</i>	<i>100</i>	<i>57</i>	<i>100</i>

POSITIVE NET INCOME EARNED FROM CROP SALES				
RESPONSE	N (ALL)	%	N (SILC)	% (SILC)
No	14	12.7	4	7.5
Yes	94	85.5	48	90.6
Uncertain	2	1.8	1	1.9
<i>Total</i>	<i>110</i>	<i>100</i>	<i>53</i>	<i>100</i>

TABLE 27. WHETHER CROP SALE REVENUES ARE SUFFICIENT TO COVER HOUSEHOLD EXPENSES IN 2021

RESPONSE	N (ALL)	% (ALL)	N (SILC)	% (SILC)
No	97	88.2	46	86.8
Yes	10	9.1	4	7.5
Uncertain	3	2.7	3	5.7
<i>Total</i>	<i>110</i>	<i>100</i>	<i>53</i>	<i>100</i>

While 73.8% (110) of customers interviewed in the customer survey sold some share of their crops, few sought PASP help with their crop sales: just 14.5% (16) of customers interviewed sought crop sales assistance from their PASP (Table 28). These 16 had, on average, smaller agricultural production than the full sample, with the median customer who sought PASP sales help planting just 2 hectares (IQR 2–3 hectares) (see Table 3 above).

TABLE 28. USE OF PASP'S HELP IN SELLING CROPS

RESPONSE	N (ALL)	% (ALL)	N (SILC)	% (SILC)	N (NON-SILC)	% (NON-SILC)
No	94	85.5	39	73.6	55	96.5
Yes	16	14.5	14	26.4	2	3.5
<i>Total</i>	<i>110</i>	<i>100</i>	<i>53</i>	<i>100</i>	<i>57</i>	<i>100</i>

For the most part, the PAsPs' support for crop sales consisted of investigating prices for crops in area markets and providing that information to their customers, so the customers could take their crops to the market with the best price. A few PAsPs acted as intermediaries with buyers, helping their customers negotiate sales – but per the PAsPs in their FGD, they did not help their customers find buyers for their crops after harvest. In the Manko SILC FGD, nine participants said they had requested their PAsP's help selling groundnuts. They told the FGD facilitators that the PAsP had linked them to a better market and helped get them a better price.

Clearly, however, most customers (85.5%) – including SILC members – did not feel a need to mobilize the PAsP to investigate prices. In the Sopy Serigne Fallou SILC FGD, the two participants interviewed said that they had not asked their PAsP for help, but rather just sold the groundnut crop to the local cooperative. Similarly, the three members interviewed in the Sopy Sidy Ahamed SILC FGD said that they had sold their crops themselves, as they needed to sell quickly to pay outstanding labor costs from the harvest.

Of the 16 customers who got PAsP help with their crop sales, 68.8% (11) received PAsP help selling groundnuts and 93.8% (15) thought the PAsP had helped them get a better price (Table 29).

TABLE 29. PASP'S CROP SALES SUPPORT TO THOSE WHO REQUESTED HELP

DID THE PASP HELP YOU GET A BETTER PRICE?				
RESPONSE	N (ALL)	N (SILC)	N (NON-SILC)	% (SILC)
No	0	0	0	75
Yes	15	14	1	25
Uncertain	1	0	1	0
<i>Total</i>	<i>16</i>	<i>14</i>	<i>2</i>	<i>100</i>
SERVICES PROVIDED BY PASP				
RESPONSE	N (ALL)	N (SILC)		
Help selling groundnuts	11	10		
Intermediation between seller and buyer	1	1		
Price negotiation	2	2		
Unspecified 'help'	1	1		
<b>HOW PASP HELPED CUSTOMERS SELL CROPS (REPRESENTATIVE RESPONSES)</b>	Provision of advice on sale price in different local markets and other useful information, intermediation, negotiation with buyers			

It is possible that more customers will request their PASP's help with crop sales in the 2021–2022 season and beyond. Although most customers interviewed had not asked their PASP for help with crop sales in 2020–2021, 43.6% (65) thought they would use the PASP this season for sales support, including all 16 of the customers who had used the PASP's help in the previous season (Table 30). For example, the eight participants of the Soukhale Mboubéne SILC FGD, who had not requested their PASP's help this year, said they thought such help would be useful in 2021–2022, “to have a better price for our production.”<sup>18</sup> In the Bok Yakar SILC FGD, both participants said they were thinking of asking their PASP for crop sales help in 2021–2022. According to one participant, the PASP could help “to find for us where the price is best.” The other participant said the PASP could help them “know each weekly market where the price is better.”

18 There is some uncertainty regarding the customers' true plans. The FGD facilitators had the impression that the FGD participants may have responded positively to the question about their plans to seek the PASP's help with sales in 2021–2022 because the FGD facilitators asked the question about it, thus putting the idea in the participants' heads.

TABLE 30. PROSPECTS FOR FUTURE PASP SALES SUPPORT TO CUSTOMERS

DO YOU THINK YOU'LL ASK PASP FOR CROP SALES HELP THIS SEASON?			
RESPONSE	N (ALL)	N (SILC)	N (THOSE WHO GOT PASP HELP LAST SEASON)
No	49	18	0
Yes	65	37	16
Uncertain	35	18	0

Analysis of customers' plans to ask the PASP for crop sales support in future is complicated by uncertainty among some customers interviewed regarding exactly what PASP crop sales support comprises. The Sopey Serigne Fallou SILC FGD participants said that they would not ask the PASP for crop sales help in 2021-2022, "but the PASP can advise us on where the price is better." This response raises the question of how well the customers understood the PASPs' role in providing crop sales support, and whether they associated investigating prices with sales support.

Customers' opinions divided on the hypothetical question of whether they would recommend the PASP to a neighbor for crop sales support, with just 43% (64) saying that they would recommend the PASP to a neighbor, and 35.6% (53) uncertain (Table 31). However, all 16 of those who had engaged their PASP's help with crop sales last season said they would recommend the PASP. It is difficult to predict from these answers whether more farmers will request their PASP's help with sales next season. But the fact that all 16 of those who got help last season planned to request it again, indicates that the PASPs can offer their customers a valuable service by providing price information and (occasionally) negotiating sales with buyers.

TABLE 31. CUSTOMERS' PERCEPTION OF PASPS' CROP SALES SUPPORT

WOULD YOU RECOMMEND PASP TO A NEIGHBOR FOR CROP SALES?			
RESPONSE	N (ALL)	N (SILC)	N (NON-SILC)
No	32	17	15
Yes	64	35	29
Uncertain	53	21	32

It remains unclear from the data to what extent the PASPs helped their customers secure better prices – or how formal the PASPs' assistance was. Might some customer respondents have thought of the PASPs' information about market prices as included in the PASPs' standard services, and not a separate effort to help with crop sales? The data do not answer this question. Moreover, the PASPs themselves expressed discomfort with their role in giving crop production advice. They told the FGD facilitators that they had not received training on crop production during their time working for myAgro, and that they would need more agricultural technical training to provide further technical support on different crop production. Finally, the effectiveness of PASPs' help with crop sales is questionable: without organizing producers for collective sales, PASPs cannot influence the market prices for the bulk sale of producers' crops, and their crop sales support role may be limited to investigating prices and informing their customers.

# 5. Discussion

## LESSONS LEARNED

Lessons learned from this study about the potential for the PASP input delivery model to provide affordable, high-quality agricultural inputs to underserved farmers include the following:

1. Farmers choose to buy inputs from PASPs. Most customers bought inputs from the PASP, rather than another vendor, because of the convenience of doing so, the better service offered by the PASP compared to other vendors, the fact that the PASP sold types of fertilizer (and certified millet seeds) better adapted to their customers' needs than those sold by competitors and the PASPs were available to customers throughout the ordering and delivery process.
2. PASPs' inputs and services reached smallholder farmers who were underserved or unserved by other agricultural vendors. Over half of respondents reported that 2020 was the first time they had bought inputs from their PASP. Of these customers, 41% reported that they had never purchased the input(s) in question before, from any source.
3. Payment was convenient for the PASPs' customers. Means of payment varied, with common sources of money including SILC share-out lump sum for SILC members, and non-agricultural IGAs for both SILC members and non-SILC customers. But while SILC sources were commonly used by SILC members, too few members of each SILC bought inputs from the PASP, so establishing a third group fund to finance inputs was not worthwhile for most SILCs.
4. PASPs' inputs and services complemented those offered by other vendors. PASPs could not offer all desired inputs, and a considerable share of their customers also bought inputs from non-PASP vendors. Several customer respondents added the PASP to the vendors from whom they bought inputs, rather than simply abandoning other vendors in favor of the PASP. (We do not really know if they abandoned any others - they could have abandoned one while retaining another - we just know what share they bought from the PASP and from other vendors, among those who were or were not buying from the PASP for the first time in 2020.)
5. PASPs found success even in difficult times. COVID-19 negatively affected most customers' ability to purchase inputs, but the PASPs saw improvements in their sales in 2020 compared to 2019, when they had sold input packages for myAgro.

6. Customers judged the inputs sold by the PASPs to be high-quality. Several customers thought the quality of fertilizer sold by the PASPs was better than the quality of the subsidized fertilizer sold by their local producers' cooperative. And some of those customers whose agricultural production increased in 2020 compared to 2019 attributed the difference to the fertilizer they had bought from the PASP. Conversely, those who saw reductions in their output compared to 2019 attributed those reductions to poor weather and flooding, reductions in their planting due to COVID-19 and God's will.
7. PASPs provided little crop sales support. While three-quarters of the PASPs' customers interviewed sold at least some share of their crops – groundnuts, as millet was cultivated for home consumption – just 16 customers said they had requested their PASP's help with crop sales. And the actions the PASPs took to support their customers were limited to investigating market prices and, less commonly, helping their customers negotiate with buyers.



Loading fertilizer for distribution to PASP customers in their villages. [Credit Sémou Guèye for CRS]

## LOOKING AHEAD

Looking ahead to future implementation of the PASP delivery model, some adjustments are needed to improve the PASPs' services to their customers and, by extension, the PASPs' earning potential. Recommended adjustments include the following:

1. Train PASPs to organize their farmer customers for collective crop sales. There is little the PASPs can do to help their customers sell their crops at a better market price if the customers are not organized into associations to conduct collective sales. Training PASPs to organize their customers for collective sales could build on precedent among CRS SILCs for creating associations – including models such as SILC Associations in Togo, meant to help the PSPs manage their workloads and resolve SILCs' problems, and SILC Group Associations (SIGA) established in Tanzania in the late 2000s for collective sales.
2. Provide PASPs with access to certified groundnut seeds to sell, to increase both seed and fertilizer purchases. The UFN PASPs did not have access to certified groundnut seeds, so if farmers wanted to buy them, they had to do so elsewhere. Providing PASPs with certified groundnut seeds to sell could increase both their seed and fertilizer sales, as working with certified groundnut seeds would likely prompt farmers to buy fertilizer from their PASP to maximize groundnut productivity.
3. Strengthen links between SILC and PASPs, to take full advantage of the pool of potential customers that SILCs provide. Most SILC members are women, and in countries like Senegal women have limited or no access to extensive farmland – but they do cultivate gardens during the dry season. Links to majority-women SILCs could therefore be strengthened by training PASPs on the cultivation of garden vegetables and helping them to negotiate the provision of garden vegetable seeds and appropriate fertilizer with suppliers. As more members of each SILC group begin to buy inputs for horticultural production from PASPs, more groups may find it useful to establish a third SILC fund to pool money for members' input purchases.
4. Conduct a more comprehensive study of the PASP model with a larger sample of smallholder farmers. This study's findings reflect the views of a relatively small sample of smallholder farmers in one region of Senegal who bought inputs and services from PASPs. To generalize and supplement this study's findings to the experience of a broader set of smallholder farmers with PASPs in other contexts – and understand how smallholders' interactions with PASPs evolve over time – future implementations of the PASP model should prioritize learning with a larger sample spread across multiple zones and countries, and collect data regularly over a longer time frame.