

Smallholder Farmer (SHF) Evaluation Report

iDE Mozambique | SMART Internal Evaluation | December 2021



Sweden
Sverige

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Abbreviations

ECPA – Escola em Campo para Pequeno Agricultor

FaFB – Farming as a Family Business

FBA – Farmer Business Advisor

FFS – Farmer Field School

GAP – Good Agricultural Practices

iDE – International Development Enterprises

ITTfs – Input Trade and Technology Fairs

LF – Lead Farmer

NTT – Nuclei for Technology Transfer

SCF – Small Commercial Farmer

SHF – Smallholder Farmer

SMART – Strengthening the Missing Middle in Agriculture for Rapid Transformation

TC – Technology Center

ToT – Training of trainers

Introduction

iDE's ultimate goal is to make rural families more resilient and self-reliant by increasing their income and livelihood opportunities to strengthen their adaptive capacity in the face of shocks and stresses. Strengthening the Missing Middle in Agribusiness for Rapid Transformation (SMART) is a project implemented by International Development Enterprises (iDE) in the provinces of Maputo, Sofala, Manica and Tete. Funded by the Embassy of Sweden in Mozambique, the 5-year project aims to reduce rural poverty through increased incomes for smallholder farmers. SMART is an agro-enterprise development project, implemented using a Market Systems Development approach. SMART specifically seeks to:

1. Increase the competitiveness of small commercial farmers and smallholder farmers involved in major value chains in cash and food crops; and
2. Strengthen private sector players along supply chains, who respond to urban and rural demands, providing access to adequate infrastructures, technologies, inputs and working capital, through non-formal finance mechanisms (catalytic funding and matching grants) and technical assistance.

To respond to SMART's theory of change, two reports were produced: SMART Internal Evaluation- FBAs and SMART Internal Evaluation- SHFs.

Table 1. SMART Result Statement

LEVEL	RESULT STATEMENT
IMPACT	Reduce poverty for smallholder farmers, particularly women and youth, in the Beira corridor and Maputo province
OUTCOME	Increase in the competitiveness of male and female small commercial farmers and male and female smallholder farmers involved in major value chains, including cash and food crops, mainly with better access and use of technology as seeds, irrigation and conservation agriculture.
OUTCOME	Stronger core private players, providing access to adequate infrastructures, technologies, inputs and working capital, through non-formal finance mechanisms (catalytic funding and matching grants) and technical assistance with specific real expertise.
OUTPUT	"FBA+SCF upgrade initiative" – A network of profitable male and female small commercial farmers and FBAs interacting with a gender-equitable client base is established.
OUTPUT	"Farmers' capacity initiative" – Increase male and female farmers' access to innovations, technologies, and farming business models through the establishment of technology centers, agribusiness incubators, NTTs, and demo plots
OUTPUT	"Value Chain Initiative" – Improve input supply, value addition, aggregation, market linkages and agribusiness services to male and female farmers through a franchisor model made up of an established network of input suppliers, aggregators, agribusiness service providers and other change agents.

In particular, SMART Internal Evaluation seeks to assess progress in SMART key impact, outcome and output indicators. Below, all indicators reported.

Result Framework

Table 2. SMART Logframe

LEVEL	INDICATORS	2021
IMPACT	Percent change in agriculture household income generated from climate-resilient livelihood activities	-11%
IMPACT	Number of people lifted out of poverty through increased sustainable incomes	-
OUTCOME	Percentage of FBAs/SCFs profitably participating as key-players in cereals, cash-crops, horticulture and inter-season crops value chains (M/F)	100%
OUTCOME	Percentage increase in profit of FBAs/SCFs participating as key-players in cereals, cash-crops, horticulture and inter-season crops (M/F)	226%
OUTCOME	Percentage of FBAs/SCFs successfully completing a non-formal loan cycle (M/F)	3% *
OUTCOME	Increase in agricultural productivity (kg/ha) of SHFs in cereals, cash-crops, horticulture and inter-season crops value chains (M/F)	Maize: 127%
		Tomato: 21%
		Cowpea: 106%
		Beans: 114%
		Rice: 114%
		Groundnut: 28%
		Sesame: 39%
		Soy: 11%
OUTCOME	Percentage of SHFs demonstrating improved technical and/or risk management skills (M/F)	99%
OUTCOME	Improvement in women's decision-making over agricultural production within the family	50%
OUTCOME	Number of SHFs successfully completing a non-formal loan cycle (M/F)	80%
OUTCOME	Percentage SHFs purchasing quality inputs (seeds, soil nutrition, disease prevention, irrigation, technology, etc.) (M/F)	100%
OUTCOME	Percentage of SHFs selling through improved output marketing Channels (M/F)	63%
OUTCOME	Percentage FBAs increasing their business value (both volume and in value terms) of supported value chains (M/F)	100%
OUTPUT	Number of FBAs/SCFs serving smallholder farmers (M/F).	233 (117 women)
OUTPUT	Percentage of farmer-clients satisfied with FBAs/SCFs, by service type (M/F)	77%
OUTPUT	Percentage of FBA/SCF clients demonstrating repeat transaction with an FBA/SCF across all areas of service (M/F)	70% (42% women)
OUTPUT	Percentage of FBA/SCF clients completing a transaction by gender (M/F)	70% (42% women)
OUTPUT	Number of FBAs/SCFs demonstrating improved financial literacy	100%
OUTPUT	Percentage of SHFs that know where to access improved inputs if they want it	92%
OUTPUT	Percentage of SHFs with know where to access improved output markets for sale	66%
OUTPUT	Number of ITTFs sessions held, and the number of people who attended.	17 ITTFs; 18,000 SHFs (11,520 women)
OUTPUT	Percentage of SHFs using technologies promoted by the project (M/F)	99%
OUTPUT	Percentage of SHFs using climate resilient agricultural practices (M/F)	99%

OUTPUT	Percentage of SHFs practicing principles of farming as a family business (FaFB) (M/F)	75%
OUTPUT	Number of SHFs demonstrating improved financial literacy (M/F)	11%
OUTPUT	Number of FBAs and SCFs linked to private sector companies (M/F)	81% (65 FBAs (42 women) linked for the first time; + additional linkages for 125 FBAs (49 women))
OUTPUT	Percentage of FBAs and SCFs linked to private sector input suppliers/providers and providing access to SHFs (M/F)	67% (53 FBAs (30 women) linked for the first time; + additional input linkages for 77 FBAs (17 women))
OUTPUT	Percentage of FBAs and SCFs linked to private sector output buyers and providing access to SHFs (M/F)	34 % (12 FBAs (all women) linked for the first time; + additional output market linkages for 48 FBAs (32 women))
OUTPUT	Percentage of smallholder farmers citing improved access to ag-markets through the project (M/F)	96%

*(6 FBA out of 85 that took the loan have paid, this data point will change by the end of the year)

Methodology

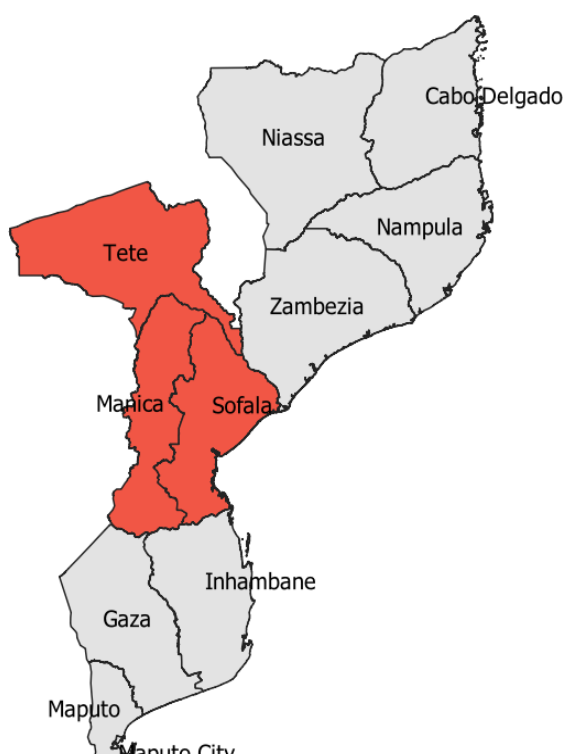
With the objective of evaluating the Farmers' capacity initiative, two surveys were conducted. The first survey was conducted in March 2021 to inquire about the 2019-20 agricultural campaign. Tracking the same farmers, the second survey was conducted in July 2021, right after the harvest time, to inquire about the 2020-21 agricultural campaign. Thus, both surveys make a panel dataset allowing one-to-one comparisons in both campaigns.

Sampling strategy and questionnaire design

As sampling strategy, the target was to interview 13% percent of the SHF within the project in Tete, Manica and Sofala provinces. The selected farmers were randomized by province, in order to have a representative sample of all producers benefiting from SMART interventions.

The questionnaire¹ contained detailed questions on agricultural production, practices, type of crops produced, land size, sales and consumption. In the follow up survey (2020-21 campaign) minor changes were made to the questionnaire, few additional questions were added to assess farmers' perception about their own agricultural outcome performance compared to the 2019-2020 agricultural campaign and the overall impact of SMART.

The questionnaire was uploaded in Taroworks which is linked to Salesforce. This allowed data collection using tablets and phones instead of pen and paper, which in turn allowed better quality checks and data cleaning.



Map 1 - Evaluated Provinces

Implementation

Before the survey began, training was conducted with a total of 35 enumerators (hired and iDE staff) then in a pre-pilot was carried out to test the instrument and the equipment. Both surveys took approximately 1 hour.

The first survey was conducted in March and it inquired agricultural output information about the 2019-20 campaign and measured with GPS coordinates (if plots were above 0.4 Ha) or physically (if plots were below 0.4 Ha) the recently planted areas for 2020-21 campaign. The

¹ See annex 1

second survey was conducted in July and August, depending on the harvesting period by province. Agricultural output information about the 2020-21 campaign was inquired plus other impact and general perception information. The completed surveys were extracted from Salesforce, organized and processed through the support tool of Microsoft Office Excel, Stata and Tableau.



Photo 1 - iDE Technicians and enumerators measuring cultivated areas

Table 3 presents the total number of farmers that were interviewed in both surveys, by province and by gender. In the first survey, on the 2019-2020 campaign, a total of 1,577 smallholder farmers were interviewed, of which 67% were female. By sampling designing strategy, Sofala and Manica had the vast majority of the interviewed farmers, 760 and 719, respectively and Tete accounted for 98 of the totals.

As was mentioned before, in the second survey, for the 2020-21 agricultural campaign, it was intended to follow the same smallholder farmers. However, in the follow up survey not all farmers that participated in the first survey were found. Hence, the 2019-20 sample and 2020-21 do not match 100%.

Additionally, technical problems resulted in loss of some surveys. All these resulted in a total of 1,349 farmers in the second survey, which means that 15% of the initial sample was lost. To overcome some of these problems new farmers were added to the sample to compensate for the number of observations as in the first-round survey. These new farmers were included in the partial analysis of 2020-21 campaign results.

For the sake of a cleaner comparison, the new farmers that were interviewed in the second-round survey were excluded from the production comparison analysis, to maintain a



Photo 2 - Enumerator surveying farmer, Sofala

balanced panel dataset, which allows one-to-one comparisons. This slightly reduced the number of farmers in the sample from 1,349 to 1,312 (83% of the original sample).

Table 3 - Number of producers in 2019-2020, 2020/2021 and in both campaigns, by province.

Province	2019-2020			2020/2021			Both campaigns		
	Male	Female	N	Male	Female	N	Male	Female	N
Manica	37%	63%	719	37%	63%	595	37%	63%	563
Sofala	27%	73%	760	27%	73%	656	27%	73%	651
Tete	43%	57%	98	43%	57%	98	43%	4%	98
Total	33%	67%	1,577	32%	68%	1,349	32%	68%	1,312

Note: The rows in each column sum up 100%

Limitations

As a solution to the lack of previous SMART information, this evaluation had to inquire about two agrarian seasons (2019-20 and 2020-21) in the same year (2021). This constitutes a limitation as producers' perception changes over time and information accuracy is affected. The main source of information, aside from the measurement of production areas, is producer's perception, which can be subjective.

As the main purpose of the evaluation is to compare producers' agricultural outcomes from one season to the other; a strict comparison of the same sample was done. Methodologically this brings cleaner results, yet logistically it is more complicated to track the same individuals through time. Hence, observations were lost between the first and the second visit, producers moving to other places, traveling at the time of the second visit and some casualties, accounted for some of the reasons why producers were not found in the second visit, reducing the sample for the comparative analysis.

The 2019-20 camping yields were calculated with production areas based on the producer's perception, as opposed to the ones calculated for 2020-21 season, that were calculated with GPS coordinates or measured physically. In addition, production can be skewed downwards as producers, particularly in areas where there has been historically development assistance, tend to report less from what they actually produced, or have commercialized, with the hope of receiving in-kind support.

Finally, a possible source of error can come from how intercropping was reported, when two or more crops were produced in the same area, the production area that was registered was the



Photo 3.- Data collection team crossing Nhan'gona River

total area reported by the producer, not an accurate representation of the share a particular crop occupied in that total production area reported. This could have had an inflating effect in the areas of crops that were intercropped, potentially reducing yield outcomes.

Production Campaign 2019-20

In this section are presented the main results obtained by farmers in the 2019-20 agricultural campaign. As mentioned above the number of farmers being considered in the analysis are 1,577 in which females are 67%.

Table 4 - Total average cultivated area (ha) and total average production by province

Province	Area (Ha)	Quantity Produced (Kg)
Manica	1.71	1,034
Sofala	1.45	951
Tete	2.17	2,983
Total	1.61	1,115

Production

On average total production area per producer was 1.6 hectares. Producers in Tete had the largest production areas, 2 hectares on average per farmer. Farmers in Manica and Sofala produced in areas of 1.7 and 1.45 hectares, respectively. On average, producers had a production of about 1,115 kg. Producers in Tete were the ones that had the highest production (2,983 kg/producer), followed by Manica (1,034 kg/producer), and Sofala (951 kg/producer). Figure 1 illustrates overall total production by crop, outlining the main crops of the 2019-20 season.

Figure 1 - Representation of total production by crop, all provinces.



Commercialization

On average, 66% of production was consumed and/or stored and the remaining 34% was sold. Intuitively, the higher the production the larger the share of it being commercialized, as more surplus is left after household consumption. Manica and Sofala producers have the largest share of production for consumption/stored, 71% and 72%, respectively. Furthermore, just over 1 in 4 producers sold part of their production. It is worth mentioning that part of the training that producers receive is that they must store part of their production to sell at times of more favorable sales prices for them. On the other hand, producers in Tete have around 62% of their production sold and the remaining 38% for consumption and/or storage.

Table 5 - Agricultural Outcomes, by province

Province	Quantity Produced (Kg)	Consumption/Storage		Sales		Revenue (USD)
		Quantity (Kg)	%	Quantity (Kg)	%	
Manica	1,034	746	72%	288	28%	101
Sofala	951	678	71%	272	29%	124
Tete	2,983	1,141	38%	1,842	62%	622
Total	1,115	738	66%	377	34%	145

Revenue

On average, farmers had an agrarian revenue of 145 USD per season. Farmers in Tete were the ones with the highest revenues, around 622 USD on average. Sofala farmers had an average agrarian revenue of 124 USD, while their Manica counterpart had 101 USD, which is considerably low. Obviously, these results can be driven by several factors, such as the period in days between the harvesting and the second survey, the most produced crops (whether or not they are the most profitable ones), access to market and the prices prevailing in the province, these aspects will be explored below.

GAP Adoption

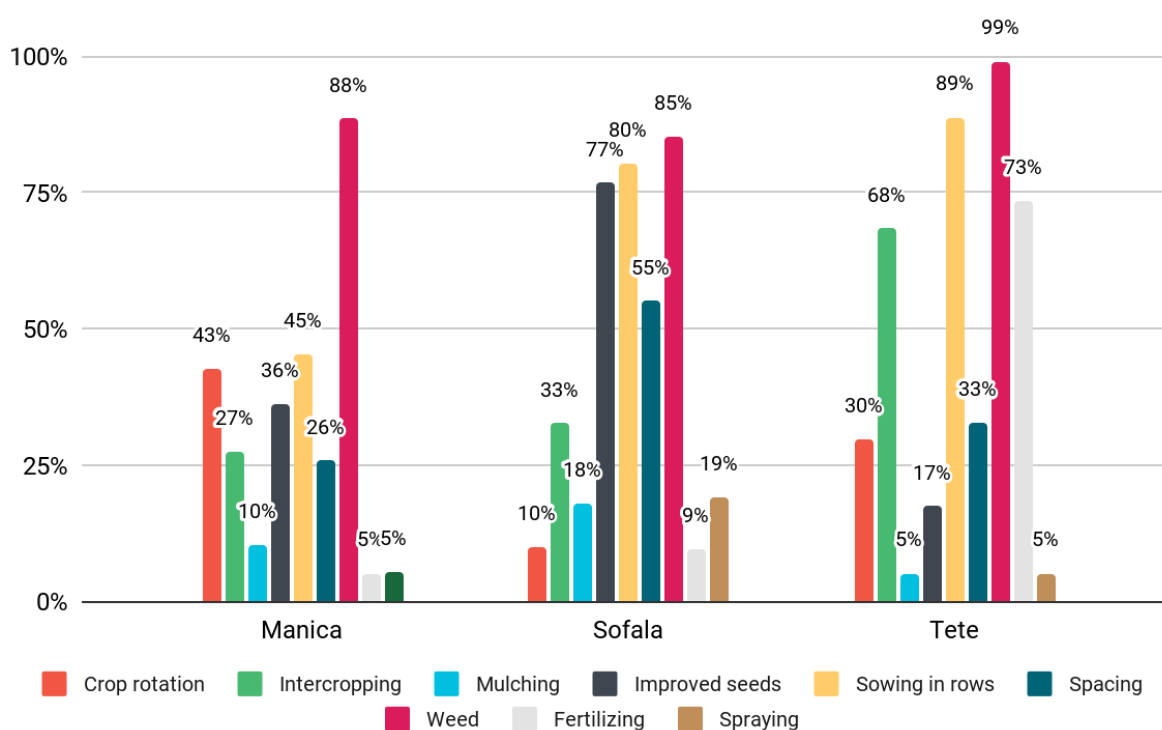
Table 6 shows the adoption of Good Agricultural Practices (GAP). **On average, farmers adopted 4 of the 9 techniques** they learned from Farmer Field Schools. Weeding technique was adopted by most farmers (88%), followed by sowing/planting (65%) and use of improved seeds (55%). Fertilizer application, spraying and mulching were the practices least used, with an average of 11%, 12% and 14%, respectively.

Table 6 - GAP adoption, by technique and province

Province	Crop rotation	Intercrop ping	Mulching	Improved seeds	Sowing in rows	Spacing	Weed	Fertilizing	Spraying	Average per Producer		N
Manica	43%	27%	10%	36%	45%	26%	88%	5%	5%	3	34%	450
Sofala	10%	33%	18%	77%	80%	55%	85%	9%	19%	5	52%	555
Tete	30%	68%	5%	17%	89%	33%	99%	73%	5%	4	47%	56
Total	26%	32%	14%	55%	65%	40%	88%	11%	12%	4	44%	1,061

At the provincial level, Sofala has the highest number of techniques adopted, on average 6 out of 9 techniques (75%). Majority of farmers (85%) adopted weeding techniques, followed by sowing/planting and use of improved seeds by 80% and 77%, respectively. Crop rotation and fertilizer application were the least used and the usage rate is below the average of the three provinces. Farmers in Manica adopted on average one third of the nine taught techniques, with weeding being the most popular (88%). The remaining techniques were adopted by less than half of the farmers, with the lowest adoption rates being for fertilizer application and use of manures. In Tete, farmers adopted an average of 4 techniques, with some differences in the most adopted techniques compared to Sofala and Manica. Nearly all farmers in Tete adopted weeding (99%) and sowing (89%).

Figure 2 - GAP adoption by province.



Production Campaign 2020-21

This section presents the main agriculture results by farmers and main crops in the 2020-21 agricultural campaign. As mentioned before for the 2020-21 agrarian campaign 1,349 farmers were interviewed.

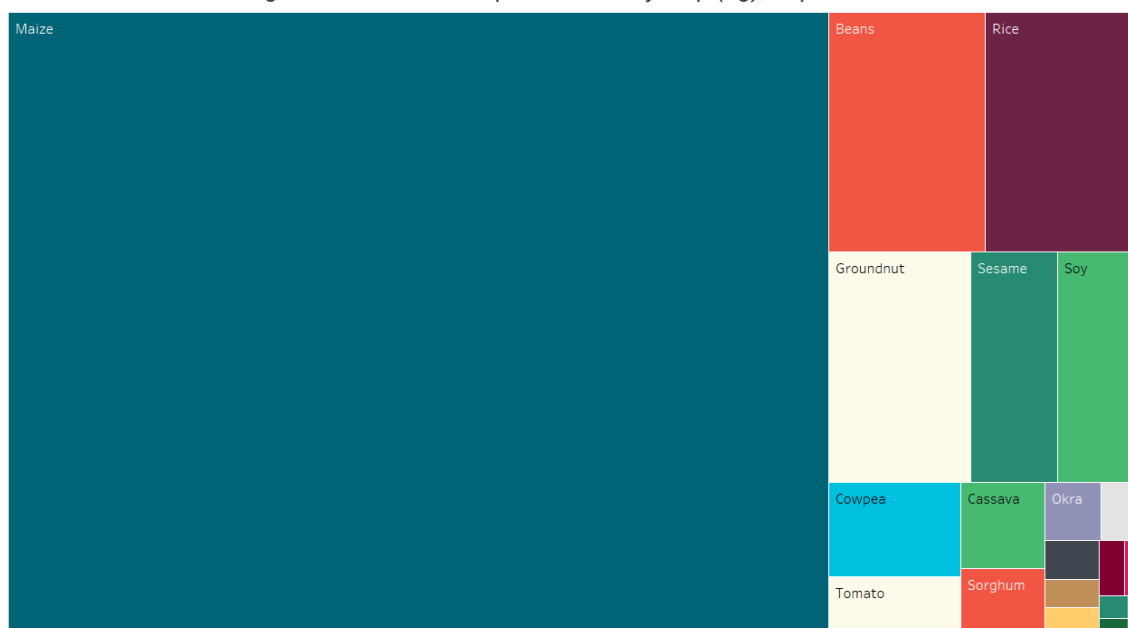
Table 7 - Production area and quantity produced

Province	Area (Ha)	Quantity Produced (Kg)
Manica	0.92	791
Sofala	0.48	589
Tete	2.21	5,579
Total	0.80	1,041

Production

On average, production area per producer was 0.8 hectare. Producers in Tete province had the largest production areas, with a little more than 2 hectares on average. Farmers in Manica had 0.9 hectare on average, while farmers in Sofala had the smallest production areas of half a hectare, on average. As shown in figure 3, maize, beans, rice groundnuts and sesame are the main crops produced.

Figure 3 - Production Representation by crop (Kg), all provinces



Total production results follow the same pattern as the production areas. **Producers in Tete had the highest average production of around 5.5 tons per farmer. In turn, Manica producers had an average production of almost 800 kg. Producers from Sofala had a relatively lower average production of around 590 kg per farmer.** Figure 3 illustrates the main value chains for 2020-21, being maize, beans, rice, groundnuts, sesame and soy.

Table 8. Destination of production

Province	Quantity Produced (Kg)	Quantity Consumed		Quantity Sold (Kg)		Revenue (USD)
		Quantity (Kg)	%	Quantity (Kg)	%	
Manica	791	669	85%	122	15%	42
Sofala	589	407	69%	182	31%	76
Tete	5,579	2,418	43%	3,160	57%	1,088
Total	1,041	669	64%	372	36%	135

Commercialization

On average, **64% of production was consumed and/or stored and the remaining 34% was commercialized.** Farmers in Manica and Sofala consumed and/or stored (to sell in the future) 85% and 69%, respectively, of their produce, and sold the remainder. In contrast, producers in

Tete have around 64% of their production commercialized and the remaining 36% for consumption and/or storage.

Revenue

On average farmers had an agricultural revenue of 135 USD, which is considerably low regardless if there are other income sources. Farmers of Manica had an average revenue of 42 USD, the lowest, and producers from Sofala had an average of 76 USD. Farmers in Tete had the highest value of revenues, around 1,000 USD on average.

GAP Adoption

In the 2020-21 campaign, the rate of adoption of good agricultural practices by farmers was high, using 5 of the 9 techniques taught in FFSs. The highest adoption rate was recorded in Tete province, where farmers adopted, on average, 7 of the 9 good agricultural practices taught. Farmers in Sofala adopted an average of 6, while farmers in Manica adopted 4 of the 9 practices.

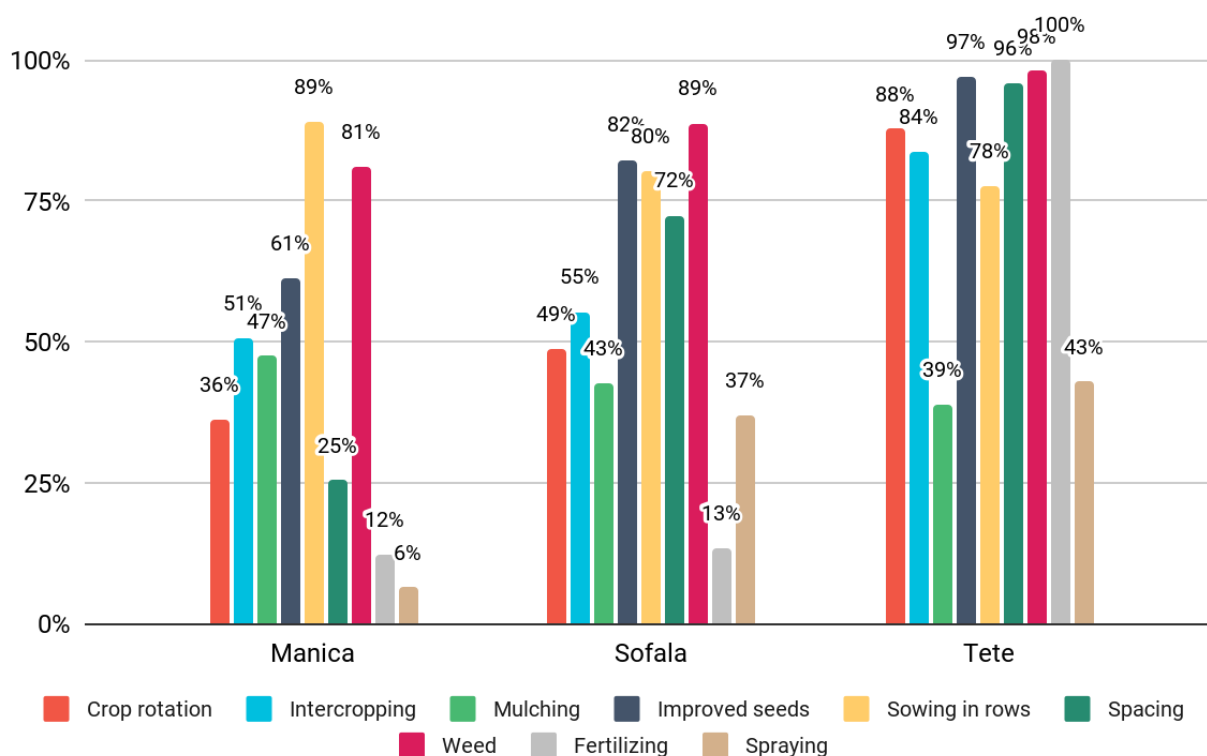
Table 9. - Good Agricultural Practices (GAPs) adoption rate province

Province	Crop rotation	Intercropping	Mulching	Improved seeds	Sowing in rows	Spacing	Weed	Fertilizing	Spraying	Average per Producer	
	%	%	%	%	%	%	%	%	%	Nr	%
Manica	36%	51%	47%	61%	89%	25%	81%	12%	6%	4	48%
Sofala	49%	55%	43%	82%	80%	72%	89%	13%	37%	6	62%
Tete	88%	84%	39%	97%	78%	96%	98%	100%	43%	7	81%
Total	46%	55%	44%	74%	84%	53%	86%	19%	24%	5	58%

In terms of production practices, weeding, sowing/planting in rows and use of improved seeds have the highest adoption rates with around 86%, 84% and 74% of farmers using, on average, respectively. No less important were spacing (53%), mulching (44%), intercropping (55%) and crop rotation (46%). The least used were spraying and fertilizer application, with a quarter and a fifth of farmers using them respectively. Between provinces, there are also slight differences between the most used practices.

In Manica, most farmers adopted sowing in rows (89%), weeding (81%), use of improved seeds (61%) and intercropping (51%). In Sofala, Weeding (89%), use of improved seeds (82%), sowing/planting in rows (80%) and plant spacing (72%) had the highest adoption rates. In Tete, adoption rates were above 80%, with the exception of spraying and mulching, which had adoption rates of 43%, 39%, respectively.

Figure 4 - GAP adoption by technique and province



Production Analysis-2019-20 vs. 2020-21

This section analyzes differences between main agricultural outcomes from 2019-20 and 2020-21 campaigns. Comparison is drawn from the same 1,312 farmers.

Table 10. Agricultural Outcomes, by producer 2019-20 vs. 2020-21

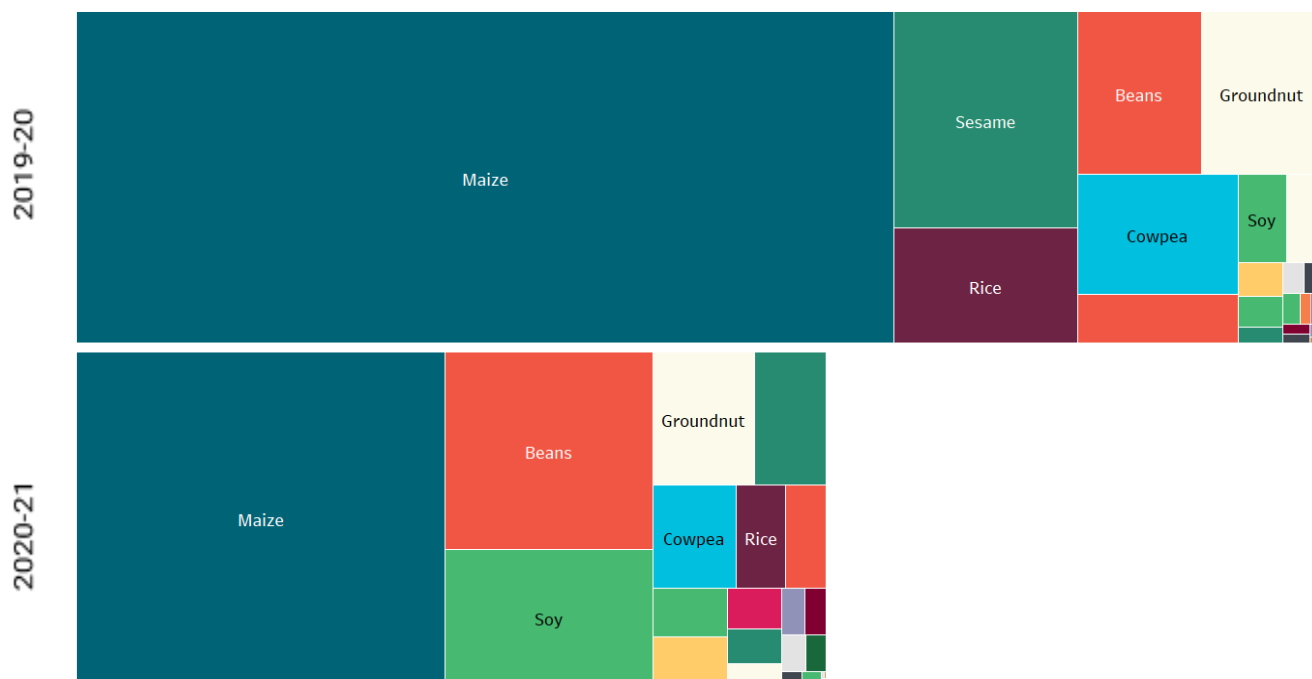
Province	Area (Ha)			Production (Kg)			Storage /Consumption			Sales (% of Production)			Revenue (USD)		
	2019 / 20	2020/ 21	Δ	2019/ 20	2020-21	Δ	2019 /20	2020 /21	Δ (PP)	2019 /20	2020-21	Δ	2019-20	2020 /21	Δ
Manica	2.3	1.3	-45%	1,025	805.2	-21%	72%	84%	12.0	28%	16%	(12.0)	95.6	43.5	-55%
Sofala	2.5	0.6	-76%	972	588.3	-39%	70%	69%	(0.9)	30%	31%	0.9	132.2	75.6	-43%
Tete	2.3	2.5	11%	2,983	5,578.8	87%	38%	43%	5.1	62%	57%	(5.1)	622.5	1,088.3	75%
Total	2.4	1.2	-52%	1,145	1,054.1	-8%	65%	64%	(0.8)	35%	36%	0.8	153.1	137.4	-10%

Production Areas

Average production areas by producer decreased from 2.4 to 1.2 (52%), with the highest decrease in Sofala (76%), followed by Manica (45%). On the other hand, areas in Tete increased by 11%. It was reported that these changes were due to attempts by producers to adapt to climate change, particularly delays in onset of the rainy season and erratic rainfall. As they normally do, producers predict the onset of the rainy season, but with decreasing certainty,

especially during the last two years. So, instead of directing their effort working on more arable land, they are adapting GAP. As for Tete, production areas had a slight increase from 2.3 Ha to 2.5 Ha.

Figure 5. Representation of total area of production by crop, 2019-20 vs.2020-21



Production

When comparing the two agrarian seasons, general production decreased by 8%, however disaggregating by province, Tete producers increased their production by 87%, while Sofala and Manica experienced reduction in production of 39% and 21% respectively. **In the areas where SMART is implemented in Sofala, the quality of the soil has been heavily affected by recent climatic shocks, Eloise and Chalane, cyclones that flooded or washed out the production areas. Manica was also affected by the previously mentioned cyclones, and producers reported erratic and late rainfall in the latest season.** Agro-climatic conditions in Tete, on the other hand, were favorable, precipitation levels were satisfactory, hence, the jump from 3 tons average production per farmer to more than 5.5 tons can be related to this, plus increased use of GAP and increased use of improved seeds.

Commercialization

On average, the percentage of production that was commercialized by producers increased slightly by almost 1%, from 35% to 36%. It dropped from 28% to 16% in Manica, remained the same in Sofala, and decreased from 62% to 57% in Tete.

Revenue



The revenue associated with the commercialization of such production decreased by 11%, with the highest drop in Manica (55%) followed by Sofala (43%).

On the other hand, Tete farmers' agricultural income increased by 75% from 622 to 1,088 USD, attributed mainly to the increase in production and good commodity prices in the area.

In areas that were hit by climatic stressors in Manica and Sofala, the in-kind food assistance by humanitarian organizations has negatively influenced farmers' motivation to produce and to commercialize their crops.

Crop Analysis-2019-20 vs. 2020-21

In the 2019-20 campaign, farmers produced around 25 different crops from cereals, legumes, vegetables and tubers, while 30 different ones were produced in 2020-21. In all provinces, **maize proved to be an important crop, being produced by over 90% of farmers**, and occupying the largest area among the main crops. In this section the main agricultural outputs from both seasons for the 5 main crops in each province will be analyzed.

Manica

Table 11. Agricultural Outcomes, by crop 2019-20 vs. 2020-21

Crop	Area (Ha)			Production (Kg)			Yield (Kg/Ha)			Sales (% of Production)			Price (USD)			Revenue (USD)		
	2020 /20	2020 /21	Δ	2019/20	2020 /21	Δ	2019 /20	2020 /21	Δ	2019 /20	2020 /21	Δ	2019/20	2020/21	Δ	2019 /20	2020 /21	Δ
Groundnut	0.69	0.48	-31%	222.0	140.8	-37%	320.1	294.5	-8%	46%	62%	16.2	0.52	0.70	37%	54.6	66.5	22%
Beans	0.60	0.52	-14%	86.4	133.2	54%	143.5	256.0	78%	53%	36%	-16.6	0.69	0.93	34%	23.2	43.1	86%
Sesame	1.16	0.52	-55%	281.0	114.7	-59%	241.6	220.9	-9%	83%	37%	-45.8	0.75	0.80	7%	169.5	34.7	-80%
Maize	1.31	0.60	-54%	890.1	734.4	-17%	679.7	1,225.3	80%	22%	11%	-10.2	0.25	0.20	-20%	48.6	16.8	-65%
Soy	0.73	0.08	-89%	1,036.7	160.0	-85%	1,422.7	2,064.5	45%	97%	75%	-22.1	0.57	0.59	4%	486.5	71.3	-85%
Sub-Total	1.07	0.58	-46%	619.9	504.8	-19%	580.9	875.2	51%	28%	16%	-12.0	-	-	-	57.8	27.3	-53%

Production

The table above shows the most grown crops by producers, being slightly different by province, yet maize, beans and groundnuts being the most popular and reflecting producers' diet. In Manica, all main crop's production area decreased, soybean having the largest drop of 89%, followed by sesame and maize with 55% and 54%. Soybean, sesame, groundnut and maize production decreased by 85%, 59%, 37% and 17% respectively, while bean's production increased by 54%.

Yields

Maize, beans and soybean yields increased by 80%, 78% and 45% respectively from one season to the other. Despite the large increase for beans, its yield is low compared to national standards², where yield can range from 2 tons to 3 tons. Maize on the other hand, evidenced remarkably satisfactory yields (1,225 Kg/Ha). Sesame and groundnut yields decreased by 9% and 8% respectively. Groundnuts and sesame yields are below national standards, as acceptable ranges go from 1 ton to 2 tons per hectare. For soybean, yields are satisfactory, as acceptable ranges are above 1 ton/Ha.

Commercialization

In the 2019-20 campaign the most commercialized crops were soybean and sesame, with 97% and 83% of it being commercialized. Both cash crops experienced a drop in commercialization in the current season, 22 percent points for soybean and 46 percent points for sesame. This might indicate two possible things, that selling produce became more difficult in the current season and/or that these crops are starting to be more consumed by households. **It was confirmed that due to COVID-19 restrictions, commercialization of agricultural products has significantly been affected, as the frequency of trips to the market places declined as well as market days and fairs.**

Commercialization increased by 16 percent points for groundnuts, while it dropped by 16 and 11 percent points, respectively, for beans and maize. For maize, which is the main staple in Manica's households, the percentage of production sold might have decreased because of the drop in production. On the contrary, for beans, it can indicate that families, despite producing more beans, are also consuming or storing to sell for later.

Revenue

Revenues increased for beans and groundnuts, by 86% and 22% respectively. For groundnuts, it could be the case as the proportion of the sales increased as well as its selling price. For beans, due to the increase in production and selling price. Revenue for soybean, sesame and maize, decreased by 85%, 80% and 65% respectively. In 2019-20 the most profitable crops were soybean and sesame and, in this season, soybean and groundnuts. **Beans and maize are the crops generating lesser revenues.**

² See annex 2 for National Yield References.

Sofala

Table 12. Agricultural Outcomes, by crop 2019-20 vs. 2020-21

Crop	Area (Ha)			Production (Kg)			Yield (Kg/Ha)			Sales (% of Production)			Price			Revenue		
	2019 /20	2020 /21	Δ	2019 /20	2020 /21	Δ	2019 /20	2020 /21	Δ	2019 /20	2020 /21	Δ	201 /20	2020 /21	Δ	2019 /20	2020 /21	Δ
Groundnut	0.40	0.32	-19%	216.2	235.2	9%	537.3	725.4	35%	40%	43%	2.5	0.36	0.66	80%	33.2	66.6	100%
Rice	0.55	0.24	-57%	436.2	401.5	-8%	792.7	1,696.1	114%	8%	24%	16.1	0.31	0.36	18%	10.2	33.4	228%
Cowpea	0.50	0.20	-59%	123.48	112.38	-9%	246.9	550.93	123%	33%	30%	-3.4	0.49	0.51	3%	19.7	16.5	-16%
Sesame	0.71	0.31	-56%	299.5	246.7	-18%	419.6	786.7	88%	94%	78%	-16.1	0.75	0.83	10%	215.5	159.8	-26%
Maize	1.04	0.35	-66%	726.6	532.4	-27%	695.7	1,519.7	118%	13%	21%	7.5	0.24	0.23	-8%	25.3	25.1	-1%
Sub-Total	0.77	0.30	-61%	531.3	369.0	-31%	690.6	1,227.7	78%	30%	31%	0.9	-	-	-	72.3	47.4	-34%

Production

Sofala's most produced crops are maize, rice and sesame. Production areas halved for all crops except groundnuts. Production also declined, however in a smaller proportion, 27%, 18%, 9% and 8% for maize, sesame, cowpea and rice respectively, and it increased 9% for groundnuts.

Yields

Remarkably, for all main crops in Sofala, yields have increased, with cowpea having the highest increase of 123%, followed by maize, rice, sesame and groundnut, with 118%, 114%, 88% and 35% respectively. However, groundnut yields, which are almost double of those in Manica, remained low, as cowpea's yield, which, for both, should be around 1 ton to 2 tons per hectare. Rice yields are remarkably high in this current season, as standard yields range between 1 ton and 3 ton per hectare, as well as maize. For sesame, yields are slightly below acceptable ranges (1 ton- 2 ton/Ha) and higher than in Manica.

Commercialization

The percentage of produce that was sold increased for rice, maize and groundnuts by 16, 7 and 2,5 percentage points respectively. While it decreased for sesame (16) and cowpea (3.4). The most commercialized crops are sesame and groundnuts. Maize and rice, on the other hand, are staple crops that are largely consumed, yet both showed an increase in their commercialized share.

Revenue

Rice and groundnuts had the higher rise in revenue, probably pushed by the large price increase and modest production and commercialization share increase, while sesame and cowpea revenues decreased by 26% and 16% respectively, due to the production decline. **Sesame is by far the most profitable crop in Sofala, while rice, cowpeas and maize the least. Yet it is important to note that revenue levels are considerably low.**

Tete

Table 13 - Agricultural Outcomes, by crop 2019-20 vs. 2020-21

Crop	Area (Ha)			Production (Kg)			Yield (Kg/Ha)			Sales (% of Production)			Price			Revenue		
	2019 /20	2020 /21	Δ	2019 /20	2020 /21	Δ	2019 /20	2020 /21	Δ	2019 /20	2020 /21	Δ	2019 /20	2020 /21	Δ	2019 /20	2020 /21	Δ
Groundnut	0.65	1.02	58%	886.7	2,203.8	149%	1,371.7	2,160.5	58%	69%	70%	0.4	0.24	0.29	20%	141.0	415.2	194%
Irish Potato	0.63	0.41	-36%	3,139.2	754.0	-76%	4,956.6	1,856.2	-63%	88%	87%	-0.5	0.83	0.78	-7%	2,637.5	566.6	-79%
Beans	0.55	0.62	11%	279.9	775.8	177%	506.0	1,261.2	149%	67%	75%	8.3	0.69	0.79	14%	127.0	472.8	272%
Maize	1.34	0.91	-33%	2,282.8	4,329.9	90%	1,699.0	4,780.1	181%	57%	52%	-5.2	0.21	0.21	-3%	291.1	489.7	68%
Soy	0.42	0.81	93%	287.7	432.4	50%	685.6	533.8	-22%	87%	68%	-18.8	0.31	0.52	67%	78.5	150.2	91%
Sub-Total	0.83	0.79	-5%	1,146.4	1,988.1	73%	1,375.4	2,523.0	83%	62%	57%	-5.1	-	-	-	239.2	387.8	62%

Production

Farmers in Tete produced mainly maize, beans and soybean, followed by groundnuts and Irish potato. The production areas for Irish potato and maize have declined by 36% and 33%, respectively, while areas for soybean, groundnuts and common bean production expanded by 93%, 58% and 11%. **Production increased significantly, even compared to other provinces, for all crops, except for Irish potatoes. Common beans had the largest production rise with 177%, followed by groundnuts (149%), maize (90%) and soybean (50%).**

Yields

Maize, common beans and groundnuts evidenced a spectacular growth of 181%, 149% and 58% respectively. Irish potato and soybean registered a decline in yields of 63% and 22%. Maize and groundnut yields are remarkably high. Evidencing the Plateau's favorable agro-climatic conditions for cereal and legumes, with advantageous temperatures (25°), optimum precipitation (1,2000 mm) and altitude (1,700 M above sea level). In this season, bean yields are close to acceptable ranges, while soybean and Irish potato are below national yield levels.

Commercialization

It is interesting to note that commercialization shares in **Tete are significantly higher than in Manica and Sofala, evidencing that farmers are producing surplus, are well linked to the market and successfully selling their production.** In 2019-20, the lowest sales proportion was 57% (maize), suggesting that all main crops in Tete are largely commercialized. In the current season the lowest was 52% for Maize and the highest was Irish potato with 87%, followed by beans (75%) and groundnut (70%).

Revenue

Beans, groundnut and soybean had the largest growth in revenues, 272%, 194% and 91% respectively. Irish potato suffered a drop of 79%. The least profitable crop is soybean, due to its low level of production. Irish potato, despite having a sharp drop in revenue from season to season, is still the crop generating more revenue, followed by maize, beans and groundnuts.

GAP adoption

The results of the adoption rate of GAP in the 2019-20 agrarian campaign, as the table 14 shows, are mixed. Most farmers adopted not more than 4 GAP per crop on average. In Manica, farmers adopted more GAP for maize and beans; the most popular GAP were weeding and sowing in rows. Still in Manica, intercropping and crop rotation were slightly used. In Sofala, for all the crops, except for rice, farmers adopted on average 4 GAPs out of 9.

The most GAPs were weeding, spacing, sowing in rows and improved seeds. In Tete, farmers adopted on average 4 GAP as it was in other provinces, weeding was the most popular practice followed by sowing in rows. Maize was the only crop with more than half of farmers adopting fertilizers.

Table 14 - GAP adoption rate by crop (2019-20)

Province	Project	Crop rotation	Intercropping	Mulching	Improved seeds	Sowing in rows	Spacing	Weed	Fertilizing	Spraying	Average per Crop
Manica	Groundnut	17%	25%	7%	28%	41%	10%	95%	1%	1%	2
	Cowpea	13%	51%	8%	19%	43%	11%	90%	4%	7%	2
	Beans	28%	23%	9%	26%	40%	19%	92%	9%	8%	3
	Sesame	22%	40%	13%	24%	29%	4%	72%	4%	8%	2
	Maize	38%	26%	8%	34%	43%	24%	88%	3%	3%	3
Sofala	Groundnut	13%	38%	27%	62%	74%	45%	88%	10%	14%	4
	Rice	2%	1%	2%	55%	45%	54%	52%	0%	4%	2
	Cowpea	14%	48%	32%	60%	66%	37%	83%	5%	20%	4
	Sesame	2%	38%	27%	86%	85%	52%	93%	14%	40%	4
	Maize	11%	37%	13%	72%	88%	52%	93%	6%	16%	4
Tete	Beans	13%	56%	0%	10%	70%	25%	95%	6%	0%	3
	Maize	29%	64%	4%	7%	79%	32%	97%	69%	3%	4
	Soy	28%	11%	2%	9%	91%	30%	100%	6%	0%	3

GAP adoption in the 2020-21 agrarian campaign was higher than in the 2019-20, although the adoption rate results are mixed. In Manica, an average of 4 GAPs were adopted in cowpea, common beans, and maize while an average of 3 GAPs in sesame and groundnut. Regardless of the crop, sowing/planting in rows, weeding and use of improved seeds were the most adopted GAPs. Fertilizer application and spraying had the least rate of adoption. In Sofala, for the same crops as in Manica, the adoption rate was higher.

Farmers adopted an average of 5 GAPs in all the most produced crops, except for rice where they adopted on average 4 GAPs. Weeding, planting spacing, sowing/planting in rows and improved seeds were applied by more than 50% of farmers per crop.

In Tete, farmers adopted an average of 3 GAPs in beans and soy, and an average of 4 in maize. For maize, fertilizers had an adoption rate of 69% followed by weeding with a rate of adoption of 97%. The rate of adoption in soy was higher for weeding and sowing in rows. For Beans, the rate of adoption weeding and sowing in rows were the most popular. Among many other reasons, the difference in the rate of adoption of good agricultural practices between the provinces may be one of the concurrent factors that explain the differences between the production output.

Table 15 - GAP adoption rate by crop (2020-21 agrarian campaign)

Province	Project	Crop rotation	Intercrop ping	Mulching	Improved seeds	Sowing in rows	Spacing	Weed	Fertilizing	Spraying	Average per Crop
Manica	Groundnut	24%	32%	39%	45%	74%	17%	73%	3%	3%	3
	Cowpea	32%	47%	41%	54%	71%	12%	80%	8%	7%	4
	Beans	33%	35%	43%	53%	83%	21%	78%	13%	13%	4
	Sesame	24%	39%	33%	56%	63%	13%	63%	9%	7%	3
	Maize	30%	48%	44%	59%	86%	23%	79%	9%	3%	4
Sofala	Groundnut	49%	58%	39%	85%	86%	76%	83%	7%	34%	5
	Rice	37%	27%	37%	61%	57%	50%	73%	9%	16%	4
	Cowpea	41%	60%	29%	70%	79%	74%	83%	11%	38%	5
	Sesame	52%	61%	37%	81%	90%	76%	91%	8%	46%	5
	Maize	42%	59%	38%	86%	83%	76%	92%	12%	35%	5
Tete	Beans	68%	86%	21%	86%	51%	85%	89%	100%	5%	6
	Maize	72%	79%	23%	90%	54%	85%	95%	100%	17%	6
	Soy	78%	5%	9%	91%	46%	61%	91%	100%	32%	5

SMART Impact

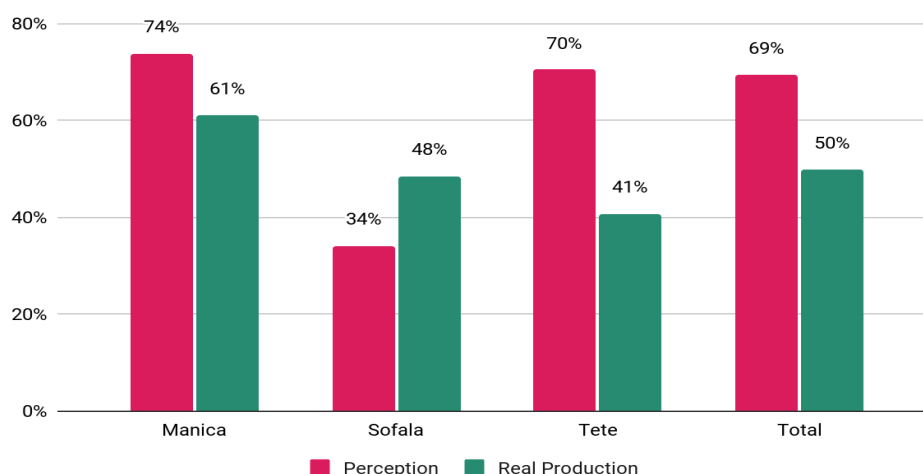


The previous section pointed out some significant reduction in the production and revenues between 2019-20 and 2020-21 agrarian campaign. In the follow up survey on the 2020-21 campaign farmers were asked a series of questions to find their own perception about the 2020-21 performance compared to the 2019-20 campaign.

Production

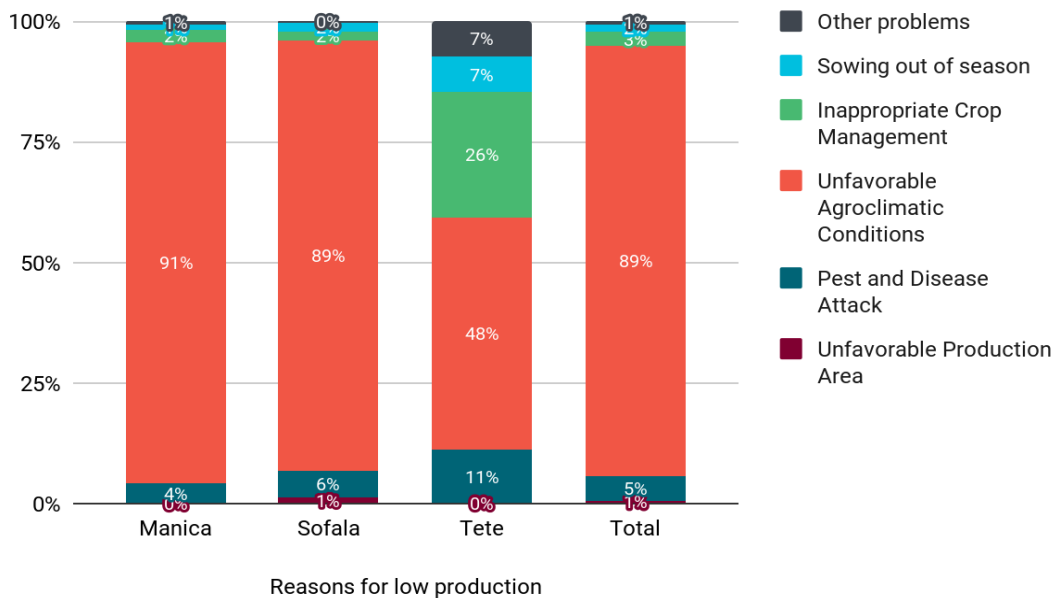
On average, 69% of respondents believed that their 2021-20 production decreased when compared to 2019-20. Although, the actual proportion of the farmers that had a decrease, based on the real production, was almost 50%. This result is relevant because it shows that our findings are in line with the farmers' perceptions. The third column shows that the average deviation between farmers' perception and actual percentage of farmers that faced production loss was about 19 percentage points. In all the provinces the farmers' perception was deviated from the real loss, showing some pessimism.

Figure 6 - Farmers that felt their 2020/2021 production reduced compared 2019-2020 by province



To explore more their perception additional questions were made about what they believed was the cause of the losses. **In all the provinces, more farmers indicated unfavorable agro-climatic conditions, around 60%.** In Manica and Sofala more than 90% pointed to the unfavorable agro climatic conditions in Tete the percentage was 48%, in line with reality.

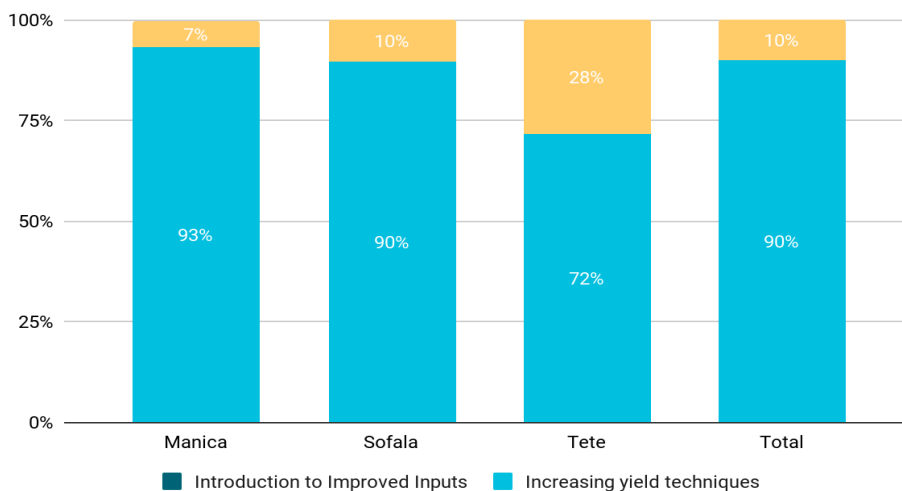
Figure 7 - Reason for low results in 2020-21 compared to 2020-21 (farmers perception)



Farmer Field Schools

Farmers were asked about the aspects they liked most during the interaction with the project and if they shared what they learned with others. **Over 90% of the farmers said they liked Increasing Yield Techniques and about 10% liked Introduction to Improved Inputs.**

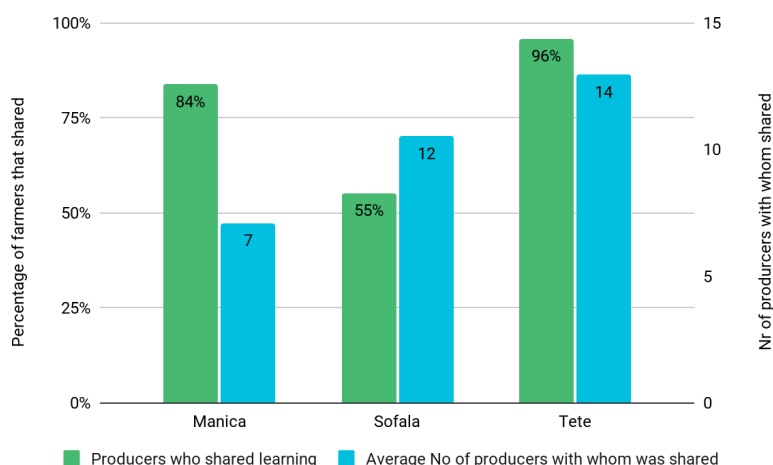
Figure 8. Most liked aspects of ECPAs



Transfer of knowledge

Producers were asked whether they have shared with other producers the techniques learnt in the Farmer Field Schools. **Around 90% of farmers shared what they learned with other 9 farmers, on average.** The chart below shows the average number of farmers each SMART producer shared the GAP learned. This is an important indicator, as it evidences the value producers give to what is taught in the FFS. Knowledge sharing was highest in Tete, where agricultural knowledge is shared, on average, with 14 other farmers in the community, followed by Sofala with 12. This spillover effect is very meaningful, as it could be claimed that **SMART has over 100,000 indirect beneficiaries**, farmers knowledgeable on GAPs outside the FFS.

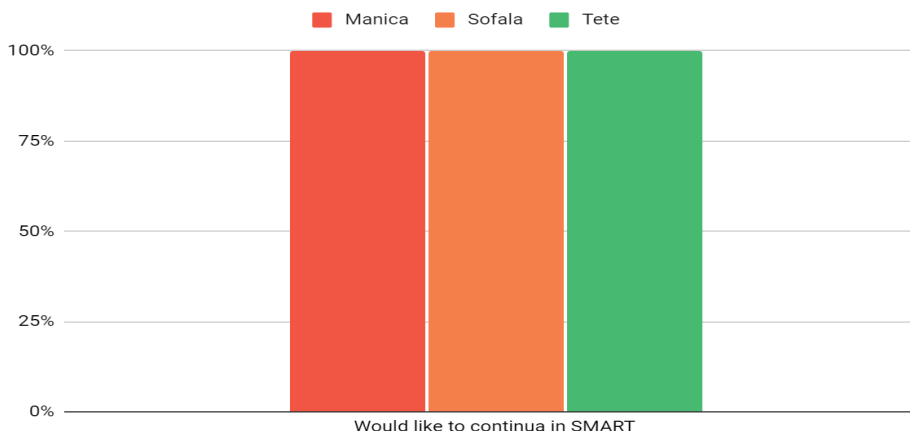
Figure 9 - Farmers that shared learning and average number of farmers whom shared with by province



Continuation

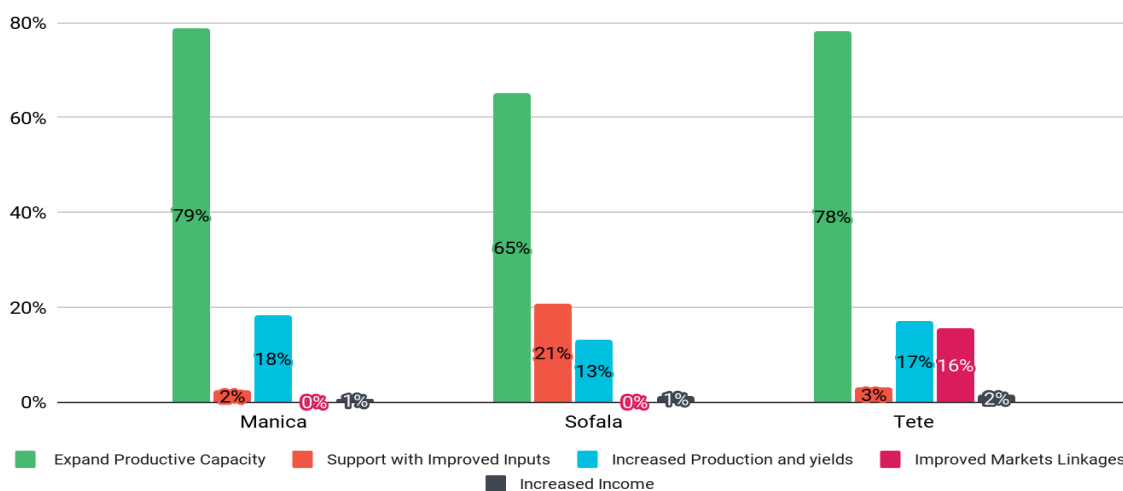
All farmers, 100%, said they would like to participate in the project again. When asked why they would like to participate again, 72% said because they were helped to increase their productive capacity, 16% because they were helped to increase production and incomes, 12% because of support with improved inputs and 2% because of market links and increased incomes.

Figure 10 - Producers that would like to continue with the project



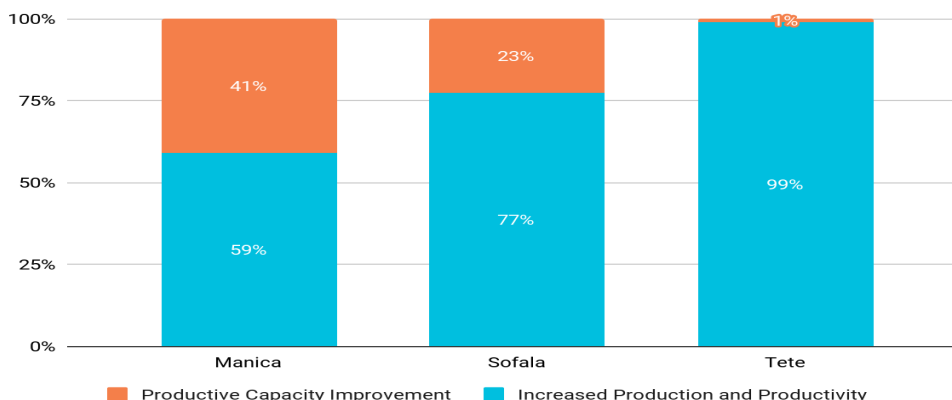
There are slight differences in the reasons for wanting to continue the projects between the provinces. In Manica province 79% and 18% of the farmers would continue with the project because of the fact that the project helped them expand productive capacity and increase production and yields, respectively. In Sofala, 65%, 21% and 13% mentioned an increase in their productive capacity, increase in production and incomes and support with improved inputs, respectively. In Tete, 78% of the farmers indicated that they would continue in the project because they want to further increase their productive capacity, 17% and 16% because of increased production and yields and market links, respectively.

Figure 11 - Reasons to stay in the project



When asked about the impact of the project in their lives, around 71% of the farmers, on average, mentioned increasing production and productivity and 29%, on average, improvement of productive capacity (see figure 12). By province, there are slight differences. In Tete 99% mentioned increasing production and productivity as the most important impact of the project. In Sofala, 77% of farmers indicated increased production and productivity as major impacts and 23% mentioned improvement of productive capacity. In Manica, around 59% of farmers indicated production and productivity and 41% indicated improvement of productive capacity.

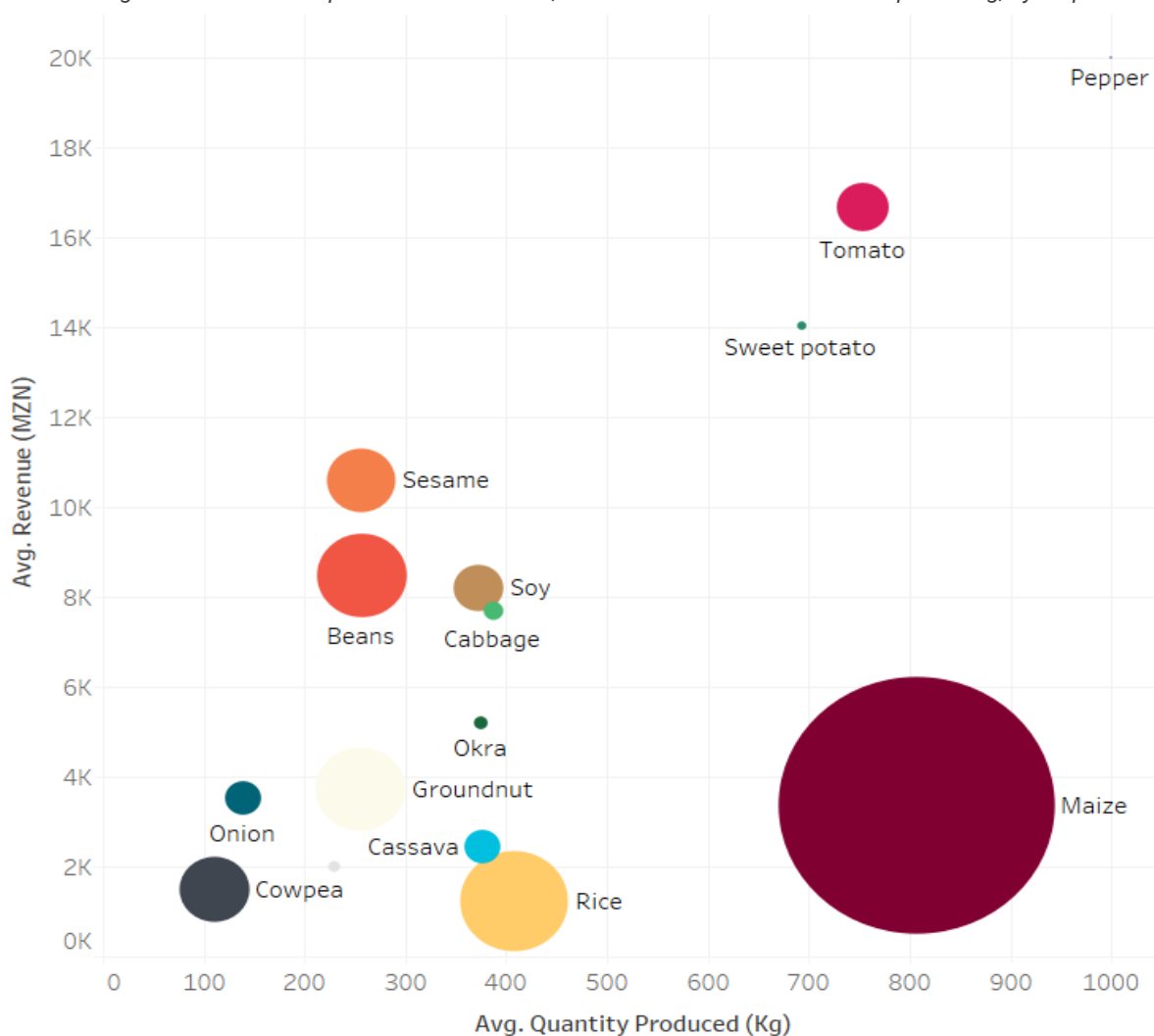
Figure 12 - Impact of joining the project



Revenue vs Effort

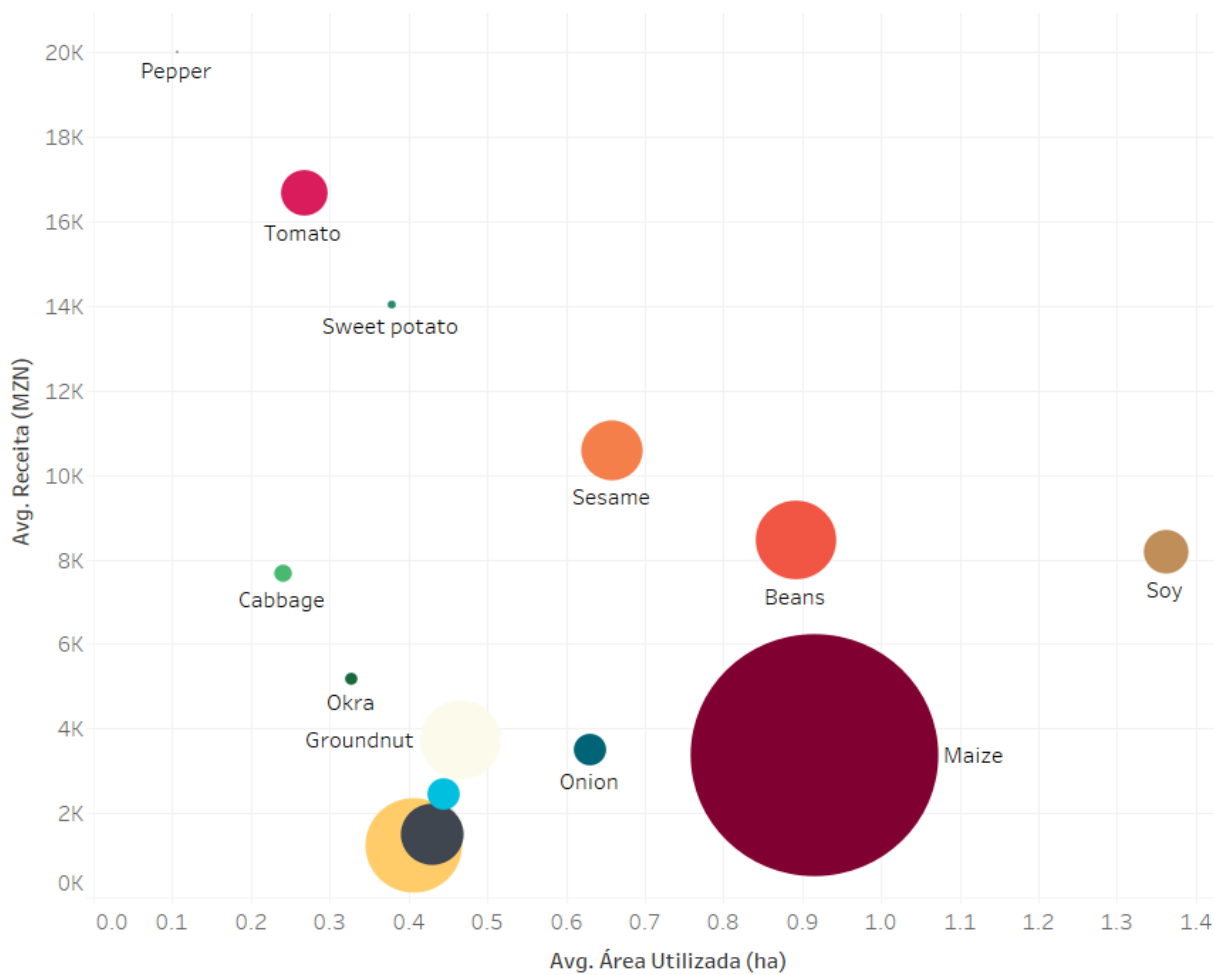
The graph below shows main crops, level of production and its relationship to the revenue they generate. Each ball is a different crop and the size depends on the number of farmers producing such crops. The graph shows that SMART farmers are allocating their production effort into the less profitable crops, being maize and rice. While the most profitable crops, sesame, beans and soybean, are less produced in terms of quantity and number of farmers producing them.

Figure 13 - Relationship between Production, Revenue and number of farmers producing, by crop



Similarly, the graph below shows main crops, area of production and its relationship to the revenue they generate. Each ball is a different crop and the size depends on the number of farmers producing such crops. The graph shows that SMART farmers are allocating larger proportions of their land into the less profitable crops. The value proposition for horticulture is clear, crops such as tomato, pepper and cabbage need less cultivation area and are highly profitable crops.

Figure 14 - Relationship between Area Production, Revenue and number of farmers producing, by crop



Conclusion

Considering the methodological limitation of this evaluation, several important conclusions can be drawn. In first place, the difference between Manica and Sofala with Tete. Climatic shock incidence and its consequences have had a considerable effect in the gap in agricultural outcomes between the provinces. As a consequence of climate change, producers in Manica and Sofala have adapted to reducing their production areas, as every year they can predict less rainfall, to concentrate efforts with GAP in less land. This is not the case of Tete, where cultivated land increased.

Production also decreased in Manica and Sofala. This does not have one single explanation, yet, unfavorable agro-climatic conditions, the effects of previous cyclones in the soil (particularly in Sofala with salinization) and the decline in production area, drove this production decrease. On the other hand, production per farmer almost doubled in Tete, while it dropped in Manica by 21% and in Sofala 39%. The share of the production that was commercialized in all provinces decreased or remained unchanged, yet, as in Sofala and Manica less was produced, in total less was commercialized as well. COVID-19 impact can surely be associated with difficulties in commercializing output in this current season.

Average revenue per farmer decreased in Manica and in Sofala and almost doubled in Tete. Aside from analyzing percentage changes, it is important to draw attention to the number per se. Revenue in Manica and Sofala are incredibly low. If assuming agricultural income as a third of total household income³, Manica and Sofala households are living under extreme poverty, with less than a dollar per day. While Tete farmers almost reach 10 US per day. Hence, it is very important to understand Sofala and Manica farmers differently from those in Tete. In particular, Beira corridor producers are vulnerable to climatic shocks, therefore interventions should not only focus

on how to mitigate the consequences of the shocks but how to adapt better to them. As for Tete farmers, intervention should be tailored regarding them more as commercial farmers.

OUTCOME

Increase in the competitiveness of male and female small commercial farmers and male and female smallholder farmers involved in major value chains, including cash and food crops, mainly with better access and use of technology as seeds, irrigation and conservation agriculture.

³ SMART Mid-Term Review 2021.

Farmer Field School's impact is evidenced in the broad adoption of GAP, which is relatively homogenous in all provinces. Despite the drop in production and production area, for major value chains, farmers increased their yields, evidencing that the adoption of GAP allowed them to produce more in less area, making them more competitive. A large majority of producers are using at least one or a mix of good agricultural techniques and that has had a positive effect in yields. For the majority of main crops, yields increase and are in satisfactory ranges when compared to national standards. This is particularly important for maize which is the main staple for households in Mozambique; the lowest yield was in Manica with 1.2 Ton/Ha, a remarkably good result taking into consideration all-natural hazards.

Finally, it is clear that SMART farmers are dedicating their efforts in terms of land allocated and labour into the production, to crops that are not the most profitable ones. Value chains such as sesame, soy and horticulture generate more revenue and the project should encourage their production further.

Annexes

1. Survey

INTRODUÇÃO			
<p>"Meu nome é [nome do pesquisador]. Eu sou um pesquisador da [iDE]. Eu estou a colectar informação para [XXX] objectivo de melhorar as condições de vida dos produtores beneficiários em [XXX] neste local. Eu gostaria de fazer algumas perguntas sobre a sua machamba, bem como, a sua produção agrícola. A informação colectada servirá de estudo de base para saber como se tem produzido, e quanto é que produz actualmente para que possamos comparar ao fim do projecto, se a nossa assistência e apoio ajudou a melhorar a sua produção. Qualquer informação que der não irá comprometer nenhum benefício específico ou oportunidade de trabalhar com [iDE]. Posso, por favor, conversar consigo por algum tempo? Obrigado"</p>			
1. INFORMAÇÃO GERAL			
1.1.	Data da Entrevista	Data: ____/____/	
1.2	Distrito		[____]
1.3	Nome do Posto Administrativo		
1.4	Nome da Vila/Comunidade		
	Projeto	1. SMART 2. FRAME 3. FRRI 4. PAAC (VALE) 5. PGRM (CLN) 6. RETRAIA 7. OUTROS	
	Número de Visita	1. Um & Dois 2. Tres	
1.5	Georreferenciamento		
1.6	Sexo	1. Masculino 2. Feminino	[____]
1.7	Nome do Entrevistado		

Agora, gostaria de vos falar sobre a sua colheita passada (2020). Por favor, enumere todas as principais colheitas realizadas na época anterior.

[illegible]

Visita 2. MEDIÇÃO ÁREA DE PRODUÇÃO POR CULTURAS

PEÇA AO AGRICULTOR QUE O LEVE A TODOS OS CANTOS (ATÉ 8) DE CADA PARCELA. CERTIFIQUE-SE DE QUE O DISPOSITIVO ESTÁ LIGADO HÁ PELO MENOS 5 MINUTOS ANTES DO PONTO DE GRAVAÇÃO. POR FAVOR PERMANEÇA EM CADA CANTO ATÉ QUE O NÍVEL DE PRECISÃO SEJA INFERIOR A 4 METROS.

9. MEDIÇÕES DE QUADRANTES

IF A PLOT HAS ONE QUADRANT, THEN FILL IN THE COLUMN OF QUADRANT 01 ONLY.

QUADRANTE 01		
9.1	O QUE FOI SEMEADO NESTE QUADRANTE?	1. Tomate 2. Pimento 3. Repolho 4. Alface 5. Cenoura 6. Beterraba 7. Feijão 8. Cebola 9. Alho 10. Soja 11. Milho 12. Feijão 13. Tabaco 14. Amendoim 15. Ervilha 16. Feijão Nhemba 17. Gergelim 18. Arroz 19. Quiabo 20. Outro (especifique) 21. Se consorciação (especifique)
9.2	O QUADRANTE É MAIOR A 0.4 HECTARES?	1. Sim (Saltar a 9.3) 2. Não (Saltar a 9.4)
9.3	SE O QUADRANTE É MAIOR O IGUAL A 0.4 HECTARES REGISTRAR AS COORDENADAS GPS DE TODOS OS CANTOS RELEVANTES DESTA QUADRANTE	GPS 1 GPS 2 GPS 3 GPS 4 GPS 5 GPS 6 GPS 7 GPS 8 (minimum 3 coordinates)
9.4	SE QUADRANTE É MENOR A 0.4 HECTARES, MEDIR COM FITA METRICA TODOS OS LADOS E REGISTRAR EM METROS	LADO 1 [____] METROS LADO 2 [____] METROS LADO 3 [____] METROS LADO 4 [____] METROS LADO 5 [____] METROS (minimum 2 lados compulsory)
9.5	TECNICO A VERIFICAR QUAIS TECNICAS AGRICOLAS O PRODUTOR ESTA A IMPLEMENTAR NA SUA MACHAMBA	1 = Rotação de culturas; 2=Consorciação de culturas 3=Cobertura morta 4=Sementes melhoradas/certificada 5=Sementeira em linhas 6=Compasso 7=Sacha 8= Adubação 9= Pulverização 10=outra (ESPECIFICAR) 11- Nenhuma
PASSA PARA 9.6 PARA O QUADRANTE SEGUINTE		

QUADRANTE 2		
9.6	O QUE FOI SEMEADO NESTE QUADRANTE?	1. Tomate 2. Pimento 3. Repolho 4. Alface 5. Cenoura 6. Beterraba 7. Feijão 8. Cebola 9. Alho 10. Soja 11. Milho 12. Feijão 13. Tabaco 14. Amendoim 15. Ervilha 16. Feijão Nhemba 17. Gergelim 18. Arroz 19. Quiabo 20. Outro (especifique) 21. Se consorciação (especifique)
9.7	O QUADRANTE É MAIOR A 0.4 HECTARES?	3. Sim (Saltar a 9.8) 4. Não (Saltar a 9.9)
9.8	SE O QUADRANTE É MAIOR O IGUAL A 0.4 HECTARES REGISTRAR AS COORDENADAS GPS DE TODOS OS CANTOS RELEVANTES DESTA QUADRANTE	GPS 1 GPS 2 GPS 3 GPS 4 GPS 5 GPS 6 GPS 7 GPS 8 (minimum 3 coordinates)
9.9	SE QUADRANTE É MENOR A 0.4 HECTARES, MEDIR COM FITA METRICA TODOS OS LADOS E REGISTRAR EM METROS	LADO 1 [____] METROS LADO 2 [____] METROS LADO 3 [____] METROS LADO 4 [____] METROS LADO 5 [____] METROS (minimum 2 lados compulsory)
9.10	TECNICO A VERIFICAR QUAIS TECNICAS AGRICOLAS O PRODUTOR ESTA A IMPLEMENTAR NA SUA MACHAMBA	1 = Rotação de culturas; 2=Consorciação de culturas 3=Cobertura morta 4=Sementes melhoradas/certificada 5=Sementeira em linhas 6=Compasso 7=Sacha 8= Adubação 9= Pulverização 10=outra (ESPECIFICAR) 11- Nenhuma
PASSA PARA 9.11 PARA O QUADRANTE SEGUINTE		

QUADRANTE 3		
9.11	O QUE FOI SEMEADO NESTE QUADRANTE?	1. Tomate 2. Pimento 3. Repolho

		4. Alface 5. Cenoura 6. Beterraba 7. Feijão 8. Cebola 9. Alho 10. Soja 11. Milho 12. Feijão 13. Tabaco 14. Amendoim 15. Ervilha 16. Feijão Nhemba 17. Gergelim 18. Arroz 19. Quiabo 20. Outro (especifique) 21. Se consorciação (especifique)
9.12	O QUADRANTE E MAIOR A 0.4 HECTARES?	5. Sim (Saltar a 9.13) 6. Nao (Saltar a 9.14)
9.13	SE O QUADRANTE E MAIOR O IGUAL A 0.4 HECTARES REGISTRAR AS COORDENADAS GPS DE TODOS OS CANTOS RELEVANTES DESTES QUADRANTE	GPS 1 GPS 2 GPS 3 GPS 4 GPS 5 GPS 6 GPS 7 GPS 8 (minimum 3 coordinates)
9.14	SE QUADRANTE E MENOR A 0.4 HECTARES, MEDIR COM FITA METRICA TODOS OS LADOS E REGISTRAR EM METROS	LADO 1 [____] METROS LADO 2 [____] METROS LADO 3 [____] METROS LADO 4 [____] METROS LADO 5 [____] METROS (minimum 2 lados compulsory)
9.15	TECNICO A VERIFICAR QUAIS TECNICAS AGRICOLAS O PRODUTOR ESTA A IMPLEMENTAR NA SUA MACHAMBA	1 = Rotação de culturas; 2=Consorciação de culturas 3=Cobertura morta 4=Sementes melhoradas/certificada 5=Sementeira em linhas 6=Compasso 7=Sacha 8= Adubação 9= Pulverização 10=outro (ESPECIFICAR) 11- Nenhuma
FIM		

Fim visita 2

20. Outro (especifique):

11. PERCEPÇÕES GERAIS		
11.1	Quais são os aspetos chave dos treinamentos que você participou?	1. Preparação do solo 2. Introdução de sementes de qualidade 3. Cobertura morta 4. Consociação de culturas 5. Agricultura de conservação, sementeira e registo 6. Produção de hortícolas, pesticidas e fertilizantes orgânicos 7. Colheita, conservação e mercados 8. Sistemas de rega, adubação orgânica 9. Nutrição humana 10. Não lembro
11.2	Teve alguma cultura cuja colheita foi mais alta neste ano comparando com a campanha passada?	1. Sim 2. Não (Se não, saltar para 11.5)
11.3	Quais?	Inserir Lista de cultura
11.4	Porque a colheita foi mais alta para estas culturas?	Texto livre
11.5	Teve alguma cultura cuja colheita foi baixa neste ano comparando com a campanha passada?	1. Sim 2. Não (Se não, saltar para 11.5)
11.6	Quais?	Inserir Lista de cultura
11.7	Porque a colheita foi mais alta para estas culturas?	Texto livre
11.8	Partilhou com mais Produtores as aprendizagens? Did you share the learning with more Producers?	1. Sim 2. Não
11.9	Com quantos produtores partilhou as aprendizagens?	__ __ Numero
11.10	Qual foi o impacto de ter aderido ao projeto?	1. Aumento dos rendimentos 2. Aumento de conhecimentos agrícolas 3. Melhorou a produção 4. Conseguiu vender maior quantidade da minha produção 5. Minha receita aumentou
11.11	Gostaria de continuar a participar no projeto?	1. Sim 2. Não
11.12	Por que?	Texto livre

2. National Yield References

National Yield Reference	
Crops	Yields (Kg/Ha)
Kale	20.000 - 30.000
Cabbage	30.000 - 50.000
Tomato	20.000 - 50.000
Onion	15.000 - 30.000
Pepper	20.000 - 30.000
Cucumber	20.000 - 30.000
Cassava	30.000 - 50.000
Lettuce	20.000 - 30.000
Green Beans	7.000 - 9.000
Cowpea	1.000 - 2.000
Soy	1.000 - 3.500
Maize	1.000 - 3.000
Irish potato	12.000 - 40.000
Beans	2.000 - 3.000
Sesame	1000 - 2500
Rice	1000 - 3000
Groundnuts	1000 - 2000

Source: Gaspar, 2010, Manual do Extensionista