



TEAMS

Transfer Efficient Agricultural technology through Market Systems in Mozambique

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Transfer Efficient Agricultural technology through Market Systems in Mozambique

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Transfer Efficient Agricultural technology through Market Systems in Mozambique

TEAMS – Transfer Efficient Agricultural technology through Market Systems Program Factsheet	
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Geographical area	Sofala and Manica province in central Mozambique

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Acronyms and Abbreviations

AFAP	African Fertilizer and Agribusiness Partnership
AKSM	Association Kwaedza Simukai Manica
CSA	Climate-Smart Agriculture
DDR	Demobilization, Disarmament, and Reintegration
DPAP	Provincial Directorate of Agriculture and Fisheries
FAR	Food security through climate Adaptation and Resilience
GAP	Good Agricultural Practice
ha	hectare
ICT	Information and Communication Technologies
ICT4Ag	Information and Communication Technologies for Agriculture
IFDC	International Fertilizer Development Center
IO	Implementing Organization
kg	kilogram
L	liter
MO	Management Organization
PPS	Peace Process Secretariat
ProTTIA	Promoters of Agrarian Technologies and Innovations Transfer
RENAMO	Resistência Nacional Moçambicana (Mozambican National Resistance)
SDAE	District Services for Economic Activities
SHF	Smallholder Farmer
SMEs	Small and Medium Enterprises
SPAE	Provincial Services for Economic Activities
TEAMS	Transfer Efficient Agricultural technologies through Market Systems
UP	United Purpose
UTTIA	Agrarian Technology and Innovation Transfer Unity
VBA	Village Based Agents
VSLA	Village Savings and Loan Association

Executive Summary

International Fertilizer Development Center (IFDC), in partnership with African Fertilizer and Agribusiness Partnership (AFAP), United Purpose (UP), and Associação kwaedza Simukai Manica (AKSM), is implementing the Embassy of Sweden-funded Transfer Efficient Agricultural technologies through Market Systems (TEAMS) program in the Manica and Sofala provinces of Mozambique. Following an inclusive market systems approach, the program is expanding program-supported linkages between farmers and agribusiness to supply essential cost-effective inputs and extension services. Ultimately, scaling the adoption of productivity-enhancing technologies and practices observing gender balance through farm demonstrations organized under public and private sector partnerships. The consortium, led by IFDC, is implementing the TEAMS program, which is a continuation of the program Food security through climate change Adaptation and Resilience (FAR-Sofala). The TEAMS program aims to reach more than 15,000 farmers in three (3) districts of Sofala Province, Nhamatanda, Buzi, and Chibabava, and four (4) districts of Manica Province, Macate, Vanduzi, Sussundenga, and Manica. By 2021, 15,418 farmers (62% women) were assisted and trained with the best agricultural practices to increase productivity and resilience to climate change, and 7,832 farmers who applied climate-smart agriculture practices (CSA) increased vegetable production with surplus sold, contributing to household income. Furthermore, as part of adaptation measures to the restrictions imposed by the COVID-19 pandemic, the program introduced innovative and appropriate solutions to continue assisting farmers on CSA utilizing Information and Communications Technologies for Agriculture (ICT4Ag). Twenty-four (24) extension messages were broadcasted, which benefited 5,968 (62% women) farmers. The program also explored partnerships and synergies with other partners or initiatives outside the consortium. For instance, TEAMS collaborated with the Peace Process Secretariat (PPS) in assisting the Demobilization, Disarmament, and Reintegration (DDR) process through training demobilized guerrillas in CSA and business skills as part of social reintegration. A total of 590 (62 women) ex-combatants were integrated into farmer groups assisted by the program and developed skills for agriculture activity. Therefore, this report provides information on the activities carried out by the TEAMS program in the Manica and Sofala province as follows:

Main TEAMS program interventions and achievements:

- Facilitated the training of 15,418 farmers (62% women) on CSA through local promoters of agricultural technologies, innovation transfer, and private sector activities.
- 60% (9 183) of trained farmers applied at least one climate-smart agricultural practice.
- Trained 7,229 smallholder farmers on using and managing low-cost irrigation systems to increase horticulture production.
- Facilitated the introduction of 127 irrigation systems in collaboration with agro-dealers and farmers organizations to intensify vegetable production.
- Supported establishment of 16 agro-dealers by building improved and resistant input and retail shops.
- Established/facilitated the linkages between farmers and local agro-dealers through field days on the benefits of using improved seeds, fertilizers, and other inputs demonstrated in the Agrarian Technology and Innovation Transfer Unities (UTTIA's).
- Facilitated the training of 5,318 farmers on vegetable processing practices to improve the nutrition.

- Facilitated the training of 4,596 smallholder farmers on post-harvest handling and vegetable crop management.
- 322 metric tons (mt) of crops such as maize, sesame, and pigeon pea, aggregated from local farmers through 15 agro-dealers as a result of the training provided on output aggregation.
- Facilitated 77 contracts between farmers and 7 local agro-dealers for improved inputs access.
- Supported local seedling producer on-demand creation and increased outreach to 2001 farmers.
- Facilitated 3 contracts between farmers and local schools for vegetable supply, benefiting 30 farmers (24 female) with a total amount of MZM 372,004.
- A total of 1,554 farmers (923 women) accessed funds through 69 village savings and loan associations (VSLAs) and invested in agriculture production and small business.
- Supported 17 spray service providers with starter kits to assist 2,001 vegetable producers in 7 communities on pest control.
- Facilitate the training and auditing of 197 vegetable producers (42 women) on local good agricultural practices (GAPs).
- Trained and coached 12 489 (81% of farmers assisted by program) of farmers assisted by program producing vegetables as income diversification and increasing resilience to climate changes.
- Supported 51% (7832 of farmers assisted) of farmers assisted in increasing vegetable productivity and income 2 times through improved inputs.
- Improvement of annual income of farmers from U.S. \$126/year to U.S. \$396/year per farmer.
- 15,418 farmers (9,559 women and 5,859 men) assisted in preventing massive contamination by COVID-19 during fieldwork, training, and distribution of personal and Grapepeel Prevention Material.
- A total of 590 (62 women) ex-combatants were integrated into farmers groups assisted by the program and developed skills for agriculture activity.
- A total of 5,968 farmers (of 4,476 program farmers and an additional 1,492 farmers not assisted directly by program) assisted through ICT for agriculture tool (SMS platform) to respond to the pest attacks (maize funnel caterpillar) caused by the late and irregular fall of rains.
- At least 60% (9 251) of farmers received information on extension through radio broadcast and applied at least one recommendation to improve production in these districts.
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- A total of 10,827 farmers (59% women) were trained on food processing to produce tomato jam, dry vegetables to be used in less availability period of the year, orange flashed potato juice and cakes, rice cakes, and kale juice, what allowed 6,388 women to develop skills on improved food preparation to improve household nutrition and food availability.
- Contributed to local employment by training and equipping with start-up kits 8 youth for pest and diseases management to provide spraying service to farmers.

- A total of 4,889 program farmers (61% women) that applied improved inputs and agricultural practices for cereals and legumes had better productivity (from 32% to the double) compared with farmers that did not use CSA practices and inputs inputs.
- To increase purchasing power for improved inputs and improve market-oriented production planning, the program introduced the agricultural fund to savings groups and linked these groups with local agro-dealers for timely provisioning of inputs.

1. Introduction

The Embassy of Sweden-funded TEAMS program (2021-2022) is a continuation of the FAR-Sofala project implemented from 2017 to 2020. TEAMS aims to increase food availability and access for an additional 15,500 farmers in Mozambique, focusing on women's economic empowerment through agriculture.

The program is being implemented by a consortium managed by IFDC, and includes AFAP, AKSM, and UP. By supporting market actors (farmers, agro-dealers, input suppliers, service providers) to develop a continuous supply network of inputs and output products, the program helps farmers increase resilience, productivity, and production using CSA practices. In the year 2021, TEAMS helped 15,418 farmers (62% women) to improve their livelihoods despite the adversities caused by two consecutive cyclones (Eloise and Chalane) and the restrictions due to the Covid-19 pandemic.

To ensure long-term sustainable interventions, the program followed market systems approach. The consortium increased the reach of existing inputs suppliers and supported the creation of input suppliers in areas where none were present. This two-pronged approach led to the development of local capacities, the creation of employment opportunities and increased resilience of rural communities to irregular weather and other external shocks and resulted in increased production and food security of rural households. Private sector engagement in agricultural inputs provision has been very successful and is essential to ensure sustainable linkages are established between rural communities and suppliers that outlast project lifetimes. This first component, which focuses on inputs provision, was complemented by a second component that focused on the promotion of climate smart agriculture, including integrated soil fertility management, and a third component that supported the creation and strengthening of village savings and loan association (VSLA). These components proved successful in ensuring rural communities have the knowledge and skills to preempt and respond to climate shocks and, that rural communities together generate sufficient capital resources to invest in critical agricultural inputs and other technologies to mitigate the impact of climate shocks, such as irrigation and processing equipment

TEAMS program assisted farmers in partnership with the private sector through training of trainers, where community individuals are coached to train other farmers. The agro-dealers are encouraged to host small plots for awareness and demand creation. We created an Advisory Board composed by members from public and private sector to advise on the implementation of the program. This allows TEAMS interventions to improve the overall enabling environment and create ownership. The program builds on the strong “leave no one behind” approach ensuring inclusion of youths as service providers, contributing for local employment.

The TEAMS program emphasized social inclusion and stressed the importance of women participation and woman leadership and therefore, women farmers and women-led farmers associations constituted the largest group of target farmers. The program recognises that women play an important role in food and nutrition security and in their families' economy. Capacity building targeting women on basic practices of food processing (processing of locally produced food into diversified food recipes, example processing of kale and cabbage into juices, processing of rice and use of rice bran for cakes production, transforming tomato into jam, among other practices) that build the confidence of women in contributing both economically and socially at household level and improve family nutrition.

TEAMS program facilitated the scaling and adoption of climate-adapted technologies and practices for sustainable diversification and intensification of cereal (maize and rice), legume (groundnuts, beans, cowpea), and vegetable crop production identified during the FAR program. TEAMS interventions also improved household nutrition through increased food availability and dietary diversity from diversified preferred crops and nutritious foods, which can also be sold or consumed by households.

The TEAMS interventions were extended to the reintegration of ex-combatants as part of the collaboration with Peace Process Secretariat. By the end of 2021, 590 (62 women) ex-combatants were integrated into farmers groups assisted by the program and developed skills for agriculture activity. With this intervention, TEAMS program contributes to the promotion of peace, social inclusion the key for stability and prosperity.

2. Narrative Report per Output and Outcome

Outcome 1: Food Availability

This component aims to increase productivity and production of food and cash crops through CSA solutions, increasing their adaptive capacity to cope with climate change impacts by adopting climate-smart agriculture inputs, practices, and irrigation solutions and using technologies to reduce post-harvest losses.

Output 1.1. Climate-Smart Agriculture Inputs

1.1.1 Introduction of climate adaptative varieties and related technologies

TEAMS facilitated the introduction of drought-tolerant varieties for maize and legumes, flood tolerant varieties for rice, and related technologies using UTTIAs. Through the training of trainers strategy, Promoters of Agrarian Technology and Innovation Transfer (ProTTIAs) were trained on the best farming practices and technologies in CSA and, in partnership with the private sector, trained 15,418 farmers. During the reporting period, 349 ProTTIAs and 518 UTTIAs were involved in program interventions. Of the total number of farmers assisted during 2021 (15, 418), 4,889 farmers (61% women) have been assisted since 2020 through FAR program.

Table 1. Number of agrarian technology and innovation transfer established

Province	District	Number of Horticulture UTTIAs	Number of Cereals and Legumes UTTIAs
Sofala	Nhamatanda	13	13
	Chibabava	13	13
	Buzi	80	9
Manica	Macate	59	28
	Sussundenga	80	44
	Manica	20	18
	Vanduzi	84	44
Total		349	169

Field days were conducted in the UTTIAs as essential activities that the program is facilitating for experience sharing and demand creation for climate-smart inputs to increase crop productivity. Field days were established in collaboration with farmers, village-based agents (VBAs), government extension officers, agro-dealers, and large input supply companies,¹ and showcased good agricultural practices (GAPs) at different stages of crop cycles to assess the impact of climate-smart inputs on vegetable production. A total of 312 field days were conducted with 13,491 farmers (60% women). The field days also served as an opportunity for value chain players to strengthen the linkages between farmers, input suppliers, and buyers. Table 2 shows the number of field days conducted and the number of farmers involved per district.

¹ Including Bayer Mozambique Lda, Klein Karoo Seeds Marketing Lda, Syngenta Mozambique Lda, Yara Mozambique Lda

Table 2. Number of farmers who participated in the field days

Province	District	Number of Field Days	Number of Men	Number of Women	Total
Sofala	Nhamatanda	7	402	310	712
	Chibabava	1	134	161	295
	Buzi	11	478	936	1,414
Manica	Macate	91	1,314	2,053	3,367
	Sussundenga	108	1,666	2,494	4,160
	Manica	5	83	161	244
	Vanduzi	89	1,352	1,947	3,299
Total		312	5,429	8,062	13,491

A total of 10,730 (62% women) farmers were trained on CSA practices using improved inputs through ProTTIAs, assisted by program officers in partnership with government and input providers technicians, to strengthen and improve their skills using improved agro-inputs and build resilience to the climate shocks and stresses. In addition, 4,688 farmers (57% women) were assisted through inputs companies in partnership with the local agro-dealers, with the assistance of the program technicians. As a result, 7,832 farmers (57% women) adopted climate-smart inputs and practices promoted by the program during the reporting period. The table below shows the number of farmers who adopted improved inputs for horticulture, cereals, and legumes production.

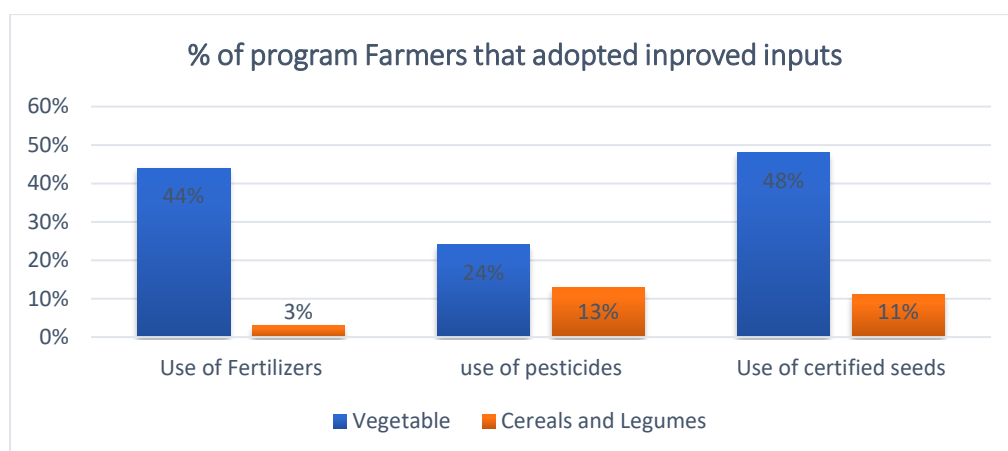


Figure 1. Percentage of farmers that adopted different inputs for horticulture, cereals, and legumes during 2021

1.1.2 Support establishment of improved and climate resistant input shops and storage facilities

The program facilitated the establishment of 16 inputs shops benefiting 16 new local agro-dealers (4 women) to improve business and increase access to inputs for smallholder farmers. Construction of the inputs shops, which have a collective storage capacity of 75 mt, was co-funded with agro-dealers, to ensure sustainable use of the infrastructure.

To improve business skills, agrodealers were trained on demand creation, business record keeping, and promotion of linkages with input suppliers. For the integration of agrodealers in

the input suppliers' network, the program supported the new agro-dealers with a start-up kit consisting of 1,637.5 kg of grain seeds, 0.5 kg of vegetable seeds, 2,150 kg of fertilizer, and 7.9 litres of crop protection products, from which, the input companies contribute 50% of the equivalent to their products, in credit, through a contract. Table 3 below shows the number of new agrodealers supported in Sofala and Manica provinces.

Table 3. Number of agro-dealers supported by the program with improved shops for inputs

Province	District	Number of Agrodealers	Number of Women
Sofala	Nhamatanda	1	0
	Chibabava	3	1
	Buzi	3	2
Manica	Macate	2	0
	Sussundenga	2	1
	Manica	2	0
	Vanduzi	3	0
Total		16	4

The supported agro-dealers were linked to farmer groups and committed to supplying improved inputs to farmer groups at fair prices and ensuring marketing of farmers' surplus. Apart from the new 16 agro-dealers, the program supported 34 agro-dealers established under FAR I program, to increase demand of improved inputs, by facilitating linkages with new program farmers and training on marketing strategies, inputs handling, stock management, business record keeping, and creation straightening of linkages with input suppliers. Table 4 shows the number of agro-dealers established during FAR and assisted in 2021.

Table 4. Number of agro-dealers established during FAR I who were assisted in 2021

Province	District	Number of Agro-Dealers	Number of Women
Sofala	Nhamatanda	7	3
	Chibabava	6	1
	Buzi	7	1
Manica	Macate	3	0
	Sussundenga	6	3
	Manica	2	1
	Vanduzi	4	1
Total		35	10

Output 1.2. CSA Practices

1.2.1 Training on climate smart agriculture cultivation practices

For the guaranteed sustainability of the program interventions, government and private sector extension officers have been involved in the planning and training on the best climate-smart agricultural practices conducted by the program and have supported the monitoring and coaching of farmers' groups. The program facilitated the training of 72 government agriculture

services extension technicians (22 women and 50 men) on CSA practices such as the use of improved seeds and seedlings, use of micro-doses of fertilizer for each crop, conservation agriculture (crop rotation, intercropping, mulching), integrated pest and disease management, optimal plant spacing. As result, 60% (9 183) of trained farmers applied at least one climate smart agricultural practice. The figure below shows the percentage of program farmers that adopted climate smart agriculture during 2021.

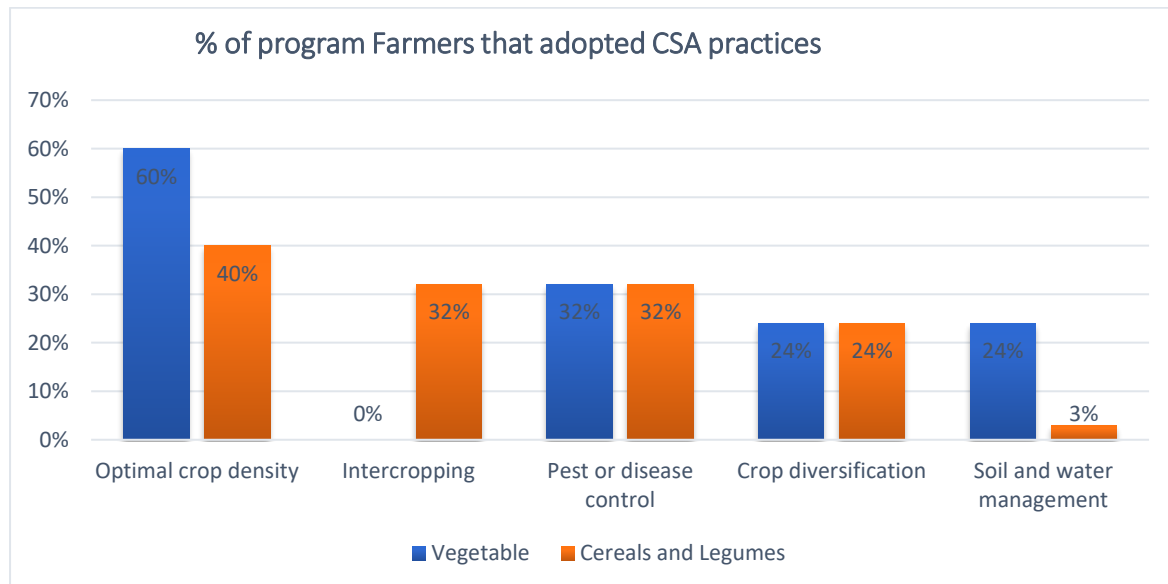


Figure 2. Percentage of farmers that adopted different climate smart agriculture practices in 2021

To increase the outreach of the promoted farming technologies, the program used local community radios and SMS platforms to broadcast messages on climate smart agriculture practices, inputs, and irrigation solutions as part of CSA in five (5) districts where the program is being implemented (Buzi in Sofala province; Macate, Vanduzi, Sussundenga, and Manica in Manica province). A total of 12 messages in each district were shared to farmers through community radios benefiting at least 3 in 5 of program farmers and farmers not assisted directly by program in the communities of program implementation, which supported these farmers with information on the rainy forecast and better plan the planting and sowing of various crops, as well as decision making on the use of short-cycle varieties and suitable pesticides for maize.

An assessment showed that at least 60% (9 251) of farmers received information on extension through radio broadcast and applied at least one recommendation to improve production in these districts.

The program adapted to the COVID-19 pandemic restrictions and used agriculture information and mass communication technologies. A partner was identified (RESILIENCE) and engaged with the program to support with ICT4Ag services. An SMS platform and soil sensors were used to help technicians assist farmers on time with the necessary information. One technician of each implementing organization (IO) was trained on using ICT tools, and a database set up for each IO, according to the priorities for each IO, of prepared messages to be sent to different farmers groups. Each farmer group identified at least 5 individuals with cell phones that can read SMS and pass the information to the rest of the group.

A total of 746 farmers received extension SMSs directly from the system and could reply to the messages with their feelings and questions for more information. These farmers, in turn, passed the message to 6 group members each and, on average 2 farmers not assisted directly by program each. This tool supported 5,968 farmers (of 4,476 program farmers and an additional 1,492 farmers not assisted directly by program) to respond to the pest attacks (maize funnel caterpillar) caused by the late and irregular fall of rains. In addition, SMSs were sent about the characteristics of this pest attack and how to control it.

The challenge with using ICT is that women have less access to information directly from the platforms because of the low level of literacy, and because of the reproductive roles, women don't have enough time to listen to the radio. As a result, although 62% of the program's farmers are women, men have the greatest direct access to information through the ICT4Ag adopted by the program, and these are the information facilitators for most women.

Output 1.3. Climate-Smart Agriculture Irrigation

1.3.1 Promotion of environmentally friendly irrigation systems solutions

To support farmers to diversify their crops and increase their production and income, the program facilitated the introduction of environmentally friendly, low cost, and easy-to-maintain irrigation solutions, that can be sold by local agro-dealers. Working with the Future Pump Company and Money Maker Company, which are the hub agro-dealers supplying mini-irrigation systems, 4 autonomous and gravity systems, 11 solar irrigation systems, and 113 pedal irrigation systems were acquired and made available to 128 farmers groups, benefiting 7,229 farmers (64% women). To ensure the sustainability of these mini-irrigation systems, farmers were trained on the use and maintenance of the equipment.

The training sessions also served as an opportunity to raise awareness of the positive environmental impacts of solar and pedal irrigation systems. In general, the training on this topic aims to equip farmers with knowledge and skills in business management. This intervention, combined with the adoption of good agricultural practices and improved inputs, allowed farmers to double the productivity of various vegetable crops.

Six (6) of the farmers trained on the use of mini-irrigation systems purchased pedal irrigation systems directly from local agro-dealers, demonstrating the importance of product promotion and demonstration and showcasing the sustainability of interventions. Given that farmers are risk-averse, the program will continue facilitating training on the irrigation systems and simultaneously exploring strategies to support small farmers in obtaining irrigation systems through the agro-dealers by facilitating agreements between local agro-dealers and hub agro-dealers to use financial packages for farmers to access the systems.

Output 1.4. Post-Harvest, Processing, and Utilization

1.4.1 Promotion of post-harvest technologies to reduce post-harvest losses

The program has promoted post-harvest technologies to improve conservation and reduce post-harvest losses for vegetables, legumes, and cereals. A total of 10,827 farmers (59% women) from associations were trained in post-harvest handling, storage, aggregation, collective marketing, and other business skills. The training aims to equip farmers and farmer groups with the skills needed to minimize post-harvest losses and adequately bulk and store their produce and address the market specificities. From this number, 260 farmers (60% women) were trained on use of cooling systems to keep vegetables.

Training manuals to be used by extension officers and ProTTIAs were developed to train farmers on post-harvest technologies. Critical post-harvest handling practices contained in the manual included drying, sorting, grading, bagging, stocking, and use of pesticide what resulted in 75% of farmers assisted by the program applying post-harvest technologies for maize conservation. The table below shows the number of farmers trained on post-harvest technologies.

Table 5. Farmers trained on post-harvest technologies

Province	District	Number of Trainings	Number of Men	Number of Women	Total
Sofala	Nhamatanda	14	640	936	1,576
	Chibabava	10	219	101	320
	Buzi	39	293	444	737
Manica	Macate	72	1,044	1,566	2,610
	Sussundenga	85	1,261	1,863	3,124
	Manica	5	62	104	166
	Vanduzi	64	916	1,378	2,294
Total		289	4,435	6,392	10,827

The most adopted technology is the use of pesticides for pest control, which resulted in the reduction of post-harvest losses by 50% among program farmers. To increase the number of farmers adopting post-harvest technologies for cereals the program facilitated the introduction of 19 mini agro-processing machines for threshing maize, rice, and beans, and delivered to youth that are providing processing services to the community. A total of 604 farmers (61% women) benefited from these technologies, which represents labor and time saving for women in 85%.

Outcome 2: Food Access

Output 2.1. Cash Crop Production for Income Generation

To increase household income, therefore contribute to better food access by farmers, the program adopted two strategies a) sensitize the farmers to produce beyond the household needs, b) diversifying from staple food to cash crops using climate smart agriculture practices and inputs. The main target crops in this outcome are rice, maize, beans, groundnut, sesame, and vegetables. As reported above, the cropping season 2020-21 was severely affected by the two consecutive cyclones that affected the region in February, coinciding with the critical stage of crop development. To reduce the impact of the cyclones, farmers were assisted on crop diversification and were able to cultivate several types of vegetables for both home consumption and market.

Demonstration plots showcased that horticulture hybrid varieties promoted in partnership with the private sector could increase farmers' productivity up to eight (8) times if applied in combination with recommended crop management practices.

From the total number of farmers assisted by program, 81% (12 489) cultivate vegetables. The market-oriented farmers allocated about 0.3ha of their land to produce vegetables. In this area farmer farmers grow at least three different crops simultaneously. The most grown vegetables are tomato, onion, cabbage, and sweet pepper, which give an average income of 42,000 MZN

per household per season, what means an income of 1.9 USD/day. Some of these farmers are able to produce vegetables twice per season.

The home consumption-oriented farmers cultivated a relatively smaller area (less than 0,3ha), and cultivated tomato, kale, lettuce, onion, and cabbage. The income earned by these farmers averaged 26,000 MZN per year, resulting in an improvement in an average daily income that varied from 0,35USD to 1,1 USD. The improvement in income and nutrition, encourages farmers to invest in vegetable production as cash crops to assist them with daily household needs. Table 6 presents average increase in productivity and cash earned by farmers engaged in vegetable production.

Table 6. Level of increased productivity bay farmers adopters of CSA inputs, practices, and irrigation for vegetable production

Crop	Average Productivity With Farmers Practices (kg/ha)	Average Productivity Applying CSA (kg/ha)	UTTIAs Average Productivity (kg/ha)	Average Income With Farmers' Practices (MZN)	Average Income Applying CSA (MZN)
Cabbage	2,174	4,888	27,830	8,826	19,845
Carrot	1,836	2,270	6,113	4,590	5,674
Green beans	733	2,105	7,253	1,759	5,052
Kale	2,075	4,572	9,116	4,358	9,601
Onion	1,380	7,738	8,929	7,866	44,107
Sweet pepper	813	7,913	14,370	6,703	65,282
Tomato	1,266	2,596	20,220	9,619	19,733

Farmers produce cereals (maize and rice) as food security crops and legumes and oil seeds (beans, groundnut, and sesame) as cash crops. Table 7 shows the increase in productivity for assisted farmers during the 2020/2021 production season who adopted improved inputs and or good agricultural practices.

Table 7. Level of increased productivity bay farmers adopters of CSA inputs and practices for cereals and legumes production

Crop	Average Productivity With Farmers' Practices (kg/ha)	Average Productivity Applying CSA (kg/ha)	Yield increase (%)
Groundnuts	535	849	59
Common beans	151	564.5	274
Cowpea	120	375	213
Sesame	334	503	51
Maize	710	934	32
Rice	422	825	95

In addition, 4,889 program farmers (61% women) that applied improved inputs and agricultural practices for cereals and legumes had better productivity (from 32% to the double) compared with farmers that did not use CSA practices and inputs inputs. However, despite maize being the most practiced crop for food security, it is the crop in which producers invest the least inputs improved by the low prices offered by the market for this crop.

According to the program study during phase I of implementation, the groups constituted of 16.4% subsistence farmers, 80.2% semi-commercial farmers, and 3.6% commercial farmers. However, groups assisted since phase I have grown to 2% subsistence farmers, 97% semi-commercial, and 1% commercial. This was caused by the availability of inputs and increased knowledge on the best practices for farming.

Program farmers produce in an average area of 1.3 ha for cereals and vegetables, where maize, beans, and sesame are practiced most of the time consociated. Most of the farmers don't use improved inputs for these crops production. The program assists farmers in increasing land of production and promoting climate adaptation and high yield varieties among farmers.

Output 2.2. Income Diversification

To increase the farmers resilience, the program sensitized farmers to diversify into off-farm sources of income. The sources include activities related to animal husbandry, entrepreneurship using finance from village saving groups, processed food from crops produced in their farms. As a result, 10,827 farmers (59% women) were trained on food processing to produce tomato jam, dry vegetables to be used in less availability period of the year, orange flashed potato juice and cakes, rice cakes, and kale juice. This intervention allowed 6,388 women to develop skills on improved food preparation to improve household nutrition and food availability.

2.2.1 Scaling up village savings loaning associations (VSLAs) among farmers

The VSLA methodology is a savings-based financial service that facilitates the mobilization of group members' savings and lending among members only, with no external liabilities. The VSLA model has been adopted and widely promoted because it emphasizes simple and accessible financial services to the vulnerable and poor communities in rural and peri-urban areas. To facilitate the establishment of VSLA, farmers were trained on (i) VSLA Concepts and Leadership/management, (ii) VSLA group/association formation, and (iii) VSLA record keeping. The training was composed of lectures/presentations and a practical demonstration to engage more with the group's members in each module. As a result, 69 VSLA were formed, benefiting a total of 1,613 farmers (54% women). Table 8 shows the number of farmers involved in savings per district and the amounts saved.

Table 8. Number of farmers involved in savings groups and volume of saves during 2021

District	Number of Men	Number of Women	Total Amount Saved (MZN)
Buzi	23	280	551,220.00
Sussundenga	232	232	599,325.00
Manica	231	194	236,573.00
Vanduzi	258	163	111,220.00
Total	744	869	1,498,338.00

Although the members are free to decide on what to spend money from the savings, the program sensitized the farmers to spend savings in purchasing climate-smart agricultural inputs to increase productivity and improve their food security. To facilitate the access to improved inputs using savings, agro-dealers were invited to showcase their products on the dates that the group members would distribute the savings. The preliminary assessment conducted by the program indicated that farmers invested about 25% of their savings in the purchase of agricultural inputs. Figure 3 shows program-assisted farmers' different uses of savings during 2022.

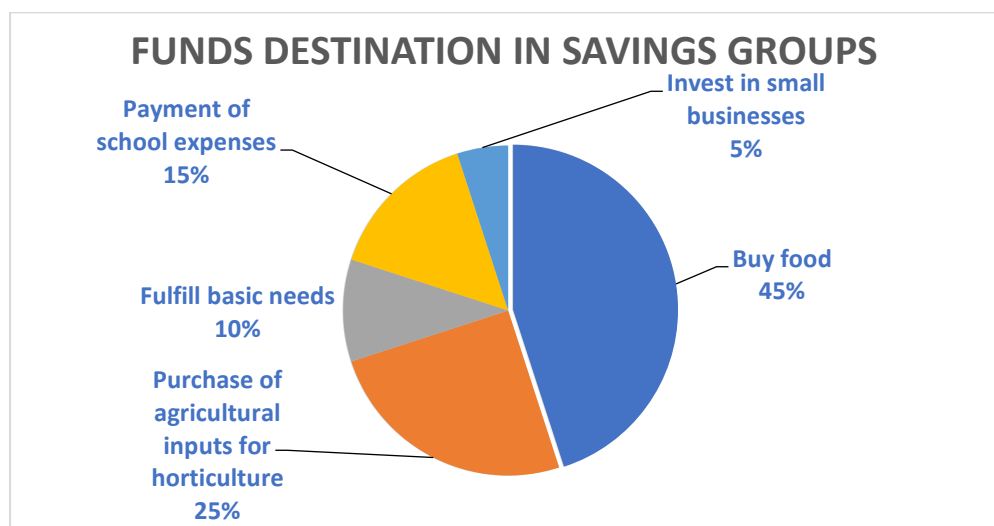


Figure 3. Areas of investment of funds from savings by farmers

Output 2.3. Farmers linked to Agro-Dealers and Service Providers

2.3.1 Linkages between farmers inputs and local service providers

The program has supported the agro-dealers’ business development, demand creation, and supply network development and assisted service providers such as seedling producers, spray service providers, and post-harvest service providers to improve their businesses. In this context, the program has been conducting exchange experience visits between farmers and agro-dealers to create linkages and increase interest in using improved inputs among program assisted farmers.

The program supported the integration of a market systems development approach into the implementation strategy by facilitating linkages between the vegetable nursery (Mbeu Yedu Inofumissa – in Buzi district) and local agro-dealers assisted by the program in the two provinces, to the smallholder farmers for seedling provision and improved seeds at cost. The strengthening of the capacity of local players in food systems allowed the farmers to access improved input to produce high-quality vegetables for consumption and market but also increased the income of the local nursery firm. With the capacity to produce 53,240 seedlings per month, the nursey reduced dependency from outside suppliers for seedlings by 40% in 2021. As a result, the seedling firm produced 55,170 seedlings (28,447 cabbage, 21,783 tomato, 1,050 kale, and 3,890 green pepper) and supplied them to farmers.

The program also supported the establishment of 77 contracts or business agreements between input providers (agro-dealers VBAs and seed companies) and smallholder farmers or farmer groups to increase smallholder farmer access to improved inputs. As a result, 15,418 farmers (62% women) were linked to local agro-dealers and seedling producers, and 6,797 farmers

(2,884 women) acquired improved inputs, mostly for horticulture production during the reporting period.

Farmers easily understood that for vegetable production, with the required quality for the market, it is important to combine GAPs with improved inputs, which contributed to increased demand for improved seeds and seedlings, fertilizers, and chemicals for vegetable production as a business. On the other hand, for cereals and vegetables, farmers invest in improved seeds, herbicides for sesame and rice weeding, and pesticides for pest control during production and post-harvest, but very few farmers apply fertilizers for cereal and vegetable production.

The program continuously mentors and monitors agro-dealers to support them in building resilience to external shocks. During the reporting period, 15 of the 34 agro-dealers established under phase 1 sold 3,172 kg of cereals and vegetable seeds, 42.8 kg of vegetable seeds, 38 mt of fertilizers, and 882 L of crop protection products. The total value of sold inputs was \$178,000. In addition, the same agro-dealers acquired and aggregated 322 mt of maize, sesame, and pigeon pea, supplied by 1,143 smallholder farmers (577 female).

Vegetable crops are susceptible to pests and diseases. Yet, farmers demonstrate a lack of knowledge in pest and disease management. Therefore, local entrepreneurs (youth) and farmers have been trained on pest and disease control and have become local spray service providers. This was found very relevant in the context of farmers where the program has been implemented because of the risk of misuse of chemicals, especially for women responsible for other household activities such as fetching drinking water, preparing food for the family, and taking care of children.

To contribute to local employment, 8 youth, were trained on pest and diseases management to provide spraying service to farmers. These youth were supported with a start-up kit Consisting of 1 bicycle, 250 ml of pesticide, and 1 spraying tank of 16 liters capacity. This intervention is at the pilot stage, and based on the results from Buzi, it will be extended to other regions where the program has activities. So far, 617 farmers (80% women) have been assisted by these youth on pest and disease control.

2.3.2 Linkages between farmers and output actors

The program has been working with local agro-dealers to get them working as output market actors. However, due to the lack of structure to store large volumes of production, these agro-dealers focus more on the business of selling inputs, which creates the need to readjust the strategy of markets for outputs separately from the inputs market.

To increase access to markets for farmers, the program has been promoting aggregation and collective selling, where through output fairs, buyers have been informed about product availability and invited to buy from program farmers. In Manica province, the program supported 963 farmers (60% women) to participate in four output fairs promoted by partners.

The program conducted the first auditing of control points and compliance criteria for entry-level SPAR and Shoprite brands to 37 smallholder farmers trained in LocalGAP as part of the accreditation and certification in partnership with AAU Technical. The field items audited included but were not limited to: production site history and site management; record-keeping; hygiene of field staff and equipment; workers' health safety and welfare; waste and pollution management; recycling and re-use of waste; traceability; fertilizer application (type, rates, and quantities, timing, methods, and storage); plant protection (type, rates, and quantities, timing,

methods, and storage); and pre- and post-harvest check (where applied). Furthermore, understanding that the formal fresh vegetable markets require consistency in quantity and quality of products supplied, and considering that some of the demanding 37 smallholder farmer processes, the accreditation process may fail the service process, AFAP signed a new agreement with AAU Technical (the unique LocalGAP farmer assurer and accreditation firm in Mozambique) for capacity building of 100 additional smallholder farmers in LocalGAP. This strategy will help increase the number of smallholder farmers with the potential to access these demanding markets.

Output 2.4. Preparedness for prevention of COVID-19

With COVID-19 measures practiced, the program incorporated COVID-19 awareness and practices during the field days and training sessions. In addition, strict measures, as prescribed by the Government of Mozambique, were practiced to prevent the spread of COVID-19. These measures included convening only a very small group of farmers (15) with social distancing of 1.5 meters and other hygienic practices, including hand washing.

Educating farming communities in rural areas on COVID-19 measures is critical, and the existing agricultural technology transfer initiatives can be easily used as a platform to promote such measures, i.e., effectively combining health and agricultural messages. This further allows food-insecure countries, such as Mozambique, to continue business as usual, without interrupting their farming operations and with compliance with measures to avoid the spread of COVID-19 among their communities.

During the reporting period, all the program farmers (15,418 smallholder farmers and 51 agro-dealers) participated in an awareness campaign in partnership with health authorities at provincial and district levels on how to adapt and live COVID-19 proactively.

3. Program Performance Indicators

The TEAMS program successfully increased access to improved inputs and introduced CSA farming techniques to increase productivity and resilience to climate change for communities in Manica and Sofala provinces. The table below shows the program's actual targets and achievements from January to December 2021.

Outcome	Common Performance Indicators (CPIs)	Results to Date
Outcome 1: Food Availability – Adaptive Capacities through CSA Solutions	<ul style="list-style-type: none"> • 15,500 smallholder farmers (SHFs) with increased adaptive capacities and food availability: • 60-75% of smallholders applying improved inputs (e.g. climate tolerant seeds), practices (incl. conservation agriculture), irrigation, and post-harvest CSA solutions • 30% increase of nutritional staple crops productivity as mt/ha (disaggregated per crop) • Annual output per farmer in mt/year (disaggregated per crop) 	<ul style="list-style-type: none"> • 15,418 farmers (62% women) assisted during 2021: <ul style="list-style-type: none"> ○ 4,889 farmers (61% women) from phase I ○ 10,529 farmers (62% women) engaged in 2021 ○ 41,334 farmers reached by FAR and TEAMS (87% of farmers engaged) • 7,832 (57% women) smallholders applying improved inputs (climate tolerant seeds), practices (incl. conservation agriculture), irrigation, and post-harvest CSA solutions.

Outcome	Common Performance Indicators (CPIs)	Results to Date
Output 1.1: CSA Inputs	<ul style="list-style-type: none"> • 20-30 private sector (large agro-input companies and local agro-dealers) making improved inputs available (disaggregated by type of input, e.g. seeds, fertilizers, etc.) • 60-75% of smallholder farmers accessing improved inputs (disaggregated by type of input) • 25-50% repurchasing rate of improved inputs by farmers (disaggregated by type of input) 	<ul style="list-style-type: none"> • 12 large agro-input companies (SYNGENTA, SEEDCO, K2, MOZFERT/ MOZGRAINS, SBOF, Bayer, EASI Seeds, ETC Adubos, IAV Lda and Agrifocus, Companhia de Zembe, Casa De Agricultor) linked to: • 50 local agro-dealers making available <ul style="list-style-type: none"> ◦ Grain seeds 41,972 kg, vegetable seeds 59.02 kg, fertilizers 432,400 kg, crop protection products 225.9 L. • 16 new agro-dealers supported to establish improved and resilient input retail shops: <ul style="list-style-type: none"> ◦ 7 in Sofala Province (Nhamatanda – 1, Buzi – 3, Chibabava – 3; 9 in Manica Province (Macate – 2, Sussudenga – 2 Manica – 2, Vanduzi - 3. • 10,529 farmers (62% women) linked to local agro-dealers accessing improved inputs. • 5,351 (61% women) program participant farmers purchasing improved inputs from the 50 existing agro-dealers, including seedlings.
Output 1.2: CSA Practices	<ul style="list-style-type: none"> • 15,500 SHFs trained by private partners on CSA cultivation practices, water harvesting, and conservation using ICT4Ag • 50% of trained farmers adopting CSA practices • 40% of trained farmers practicing conservation agriculture practices and integrated soil fertility management (as part of CSA) limiting negative environmental impacts 	<ul style="list-style-type: none"> • 15,418 farmers (62% women) trained by TEAMS in collaboration with private partners on CSA cultivation practices, water harvesting, and conservation. • Radio messages and SMS platforms are used to broadcast messages about CSA cultivation practices, water harvesting, and conservation. • 98 soil moisture sensors made available to farmer organizations.
Output 1.3: CSA Irrigation	<ul style="list-style-type: none"> • # of CSA irrigation solutions made available to SHF via private partners • 4,000-5,000 of SHF accessing low-cost irrigation solutions (disaggregated per type of irrigation solution) 	<ul style="list-style-type: none"> • 3 CSA irrigation solutions were made available to SHF via private partners (11 solar irrigation pumps, 113 pedal pumps 3 autonomous and gravity systems), which benefited 7,229 SHFs. •
	<ul style="list-style-type: none"> • # of farmers trained on new technologies for farming, water harvest, and conservation using ICT4Ag 	<ul style="list-style-type: none"> • 7,229 SHFs (64% women) trained in leadership, entrepreneurship, record keeping, and cost-benefit analysis based on the irrigation system.
Output 1.4: Post-Harvest,	<ul style="list-style-type: none"> • # of CSA post-harvest and processing solutions made available via private partners 	<ul style="list-style-type: none"> • 5,318 SHF were trained on improved food utilization practices (vegetable processing)

Outcome	Common Performance Indicators (CPIs)	Results to Date
Processing, and Utilization	<ul style="list-style-type: none"> • 9,000 SHF adopting CSA post-harvest and processing solutions • 10% reduction in average annual post-harvest losses (disaggregated per crop and considering annual variations in climate-related impacts) • # of SHF trained on improved food utilization practices • 30% of trained farmers adopting improved food utilization practices 	<ul style="list-style-type: none"> • 4,596 SHF were trained on post-harvest handling crop management for vegetables • 260 trained SHF using cooling systems to prolong saving time for vegetables.
Outcome 2: Food access	<ul style="list-style-type: none"> • 10,000 of SHF increasing absorptive capacities and access to food beyond own production Based on: <ul style="list-style-type: none"> ○ Annual sales of cash crops in mt/year per farmer ○ Annual sales from income diversifying activities ○ Increase in annual net income in MZN/year from cash crop production and income diversifying activities 	<ul style="list-style-type: none"> • 81% of program farmers producing vegetables as income diversification and increasing resilience to climate changes. • 51% of farmers assisted increasing vegetable productivity and income in 2 times through application of improved inputs. • Increase of percentage of commercial and semi-commercial farmers from 83,8% to 98% of assisted farmers, having an annual net income from 684 U.S. \$/year per farmer. • Improvement of annual net income for subsistence farmers from 126 U.S. \$/year to 396 U.S. \$/year per farmer.
Output 2.1: Cash crop production	<ul style="list-style-type: none"> • 15,500 farmers producing cash crops linked to private sector companies (agro-dealers) and traders/export- markets • # of cash crops farmers adopting CSA solution in inputs, practices, irrigation, and post-harvest • 25% increase in cash crops productivity and output per farmer (in mt) 	<ul style="list-style-type: none"> • 11,961 farmers a producing cash crop (4889 from FAR 1 and 7,072 from TEAMS) • 16 new agro-dealers trained on grains aggregation • 1,143 SHFs (50% female) have been reported selling 322 mt of maize, sesame, and Pigeon pea through the 34 agro-dealers promoted under FAR I program. • 3 contracts for supplying vegetables to local schools in Chibabava district facilitated and benefited 30 SHFs (24 female) with MZM 372,004.20.
Output 2.2: Income diversifications	<ul style="list-style-type: none"> • 15,500 farmers engaging in income diversifying activities (disaggregated by type of activity) • # of farmers increasing production from diversified activities for consumption and sales • # of women benefitting from WEE targeted interventions • 3,000 of SHF access funding opportunities (disaggregated by type of funding) 	<ul style="list-style-type: none"> • 9,012 (56% women) farmers engaged in vegetable production as part of income diversification. • 1,554 SHF (923 woman) access funding through VSLA. A total of 1,498,365,00 MZN saved and invested in agriculture and small business. • 9,559 women (2,982 from FAR) participating in and actively engaged in the program interventions as part of WEE.

Outcome	Common Performance Indicators (CPIs)	Results to Date
Output 2.3. Farmers linked to agro-dealers and services providers	<ul style="list-style-type: none"> • # of SHF using services providers to improve their business • # of services providers offering their services and are actively engaged with farmers 	<ul style="list-style-type: none"> • 15,418 farmers (62% women) linked to the 50 agro-dealers, established under FAR and TEAMS. • 1 seedling service provider linked to farmers; 2,001 SHF (76% woman) used seedling • 197 smallholder vegetable producers (42 women) trained and audited on local GAPs practices. • 17 spray service providers trained and supported with starter kits to assist 2,001 vegetable producers in 7 communities.
Output 2.4. Preparedness for prevention of COVID-19	<ul style="list-style-type: none"> • # of households assisted in the prevention of massive contamination by COVID-19 during fieldwork, training, 	<ul style="list-style-type: none"> • 15,418 smallholder farmers (9,559 women and 5,859 men) assisted in the prevention of massive contamination by COVID-19 during fieldwork, training,

4. Synergies and Collaboration

4.1. Synergies and Collaboration with the Peace Process Secretariat

The TEAMS program is implemented in districts where former RENAMO combatants are farmers of the DDR process. TEAMS is an inclusive program, and worked in collaboration with the PPS, to assist a total of 590 ex-combatants (62 women) who benefited from TEAMS interventions over the seven (7) districts of Sofala and Manica provinces (Table 9). Given that all of them lacked any farming equipment and other productions inputs, the program, in collaboration with agro-dealers, assisted the ex-combatants with vegetable and cereal seeds, fertilizers, crop protection products, water cans, and knapsack sprayers, hoes, axes, rakes, machetes.

To support the social reintegration of these individuals, the program involved demobilized guerrillas in all interventions in the areas of action. In partnership with the peace secretariat, individuals were identified, sensitized, with the support of their representatives at the government and party level and integrated into the farmer's groups assisted by the program.

Table 9. Number of DDR farmers assisted by program during 2021

Province	District	Number of Men	Number of Women	Total
Manica	Vanduzi	44	2	46
	Macate	32	1	33
	Sussundenga	80	25	105
	Manica	10	12	22
Sofala	Chibabava	119	9	128
	Buzi	38	2	40
	Nhamatanda	205	11	216
	Total	528	62	590

To assist demobilized guerrillas, the program conducted a needs assessment to understand the level of assistance that this group would require. In addition, the program supported the engagement of input suppliers for the provision of inputs package and implements (vegetable and cereal seeds, fertilizers, crop protection products, water cans, and knapsack sprayers) and conducted training through established UTTIAs, in partnership with input suppliers, local agro-dealers and seedling provider.

4.2. Synergies and Collaboration between Implementing Organizations

IFDC management organization organizes online coordination meetings twice a month and quarterly in-person meetings with all implementing organizations. These meetings allowed the program to identify the necessity of reporting on finance monthly to improve program implementation and responsibly budget execution. In addition, the consortium has been exploring knowledge sharing to strengthen and build each other's capacity in different areas of expertise (e.g., AKSM supported IFDC on the training of ProTTIAs on improved food preparation through tomato processing to reduce post-harvest losses and improve nutrition as well as supported UP on training of farmers for creation of savings groups).

4.3. Synergies and Collaboration between TEAMS and SMART program

The TEAMS program management and implementation team held monthly with the SMART program management team to share areas of action, main interventions, and target groups for each program and interacted regularly and effectively with field teams. This made it possible to ensure synergies and collaboration between the two programs in areas where both are implemented simultaneously so that agro-dealers established through TEAMS-FAR are supported through SMART to participate in input fairs promoted by iDE as well as other partners. So far 3 agro-dealers (Flora Comercial, Mbeu Yakanaka and Jumaica Investments) were able to participate in four (4) inputs fairs organized by iDE (in Gondola district in Manica, Buzi, Nhamatanda and Dondo districts in Sofala) and sold various products to farmers.

4.4. Synergies and Collaboration with Government and Private Sector

The government is represented by the Provincial Services for Economic Activities (SPAЕ) and Provincial Directorate of Agriculture and Fisheries (DPAP) at the provincial level and SDAEs at the district level. Private sector players have also been key partners in the TEAMS Program. All trainings and field days were conducted in partnership with government and private sector extension officers. During the reporting period, the program had 4 meetings with government members at the provincial level, with the participation of MO and the IOs that work in the respective provinces. In the meetings, there were shared challenges and discussed priorities in the agriculture sector in the districts of program intervention. These meetings were important to align government expectations to program interventions, especially for the assistance of the DDR farmers, and to have support and commitment of the provincial and district level to achieve program goals.

To facilitate alignment of program interventions with government priorities, as well as ensure close collaboration between the public and private sector in interventions related to market systems, the program established an advisory group composed of representatives of the government at the provincial level and of the private sector. During these sessions, it was possible to gather from the partners, experiences on aspects related to commercialization, from which the program was widely advised to look like a viable solution to support existing small and medium enterprises (SMEs) to leverage them to increase their ability to aggregate products through improving infrastructure and establishing links with major buyers.

The program held meetings with the improved inputs providers namely, Klein Karoo Seeds, EASI Seeds, Syngenta, Bayer, Yara, Agrifocus, MOZFERT/MOZGRAINS, ETC Adubos, SBOF, Agrifocus and Abilio Antunes, LUTEARI, ETG, and OLAM. This is to plan the timely provision of adequate inputs to the farmers through the existing networks of agro-dealers, strengthening their linkages with the local agro-dealers to encourage the availability of credit packages for agro-dealers. The synergies and collaboration resulted in joint training of agro-dealers, mutual technical assistance to monitor of the technology transfer units, and conduction of field days. In addition, the suppliers went behind their core business. They supported program efforts to reintegrate ex-combatants in Sofala province, providing inputs and agricultural tools and implements and training to support these groups to create capacity to start the agricultural activity.

5. Lessons Learned

During the reporting period, some lessons were learned as listed below:

- The existence of viable markets for the commercialization of agricultural products guides the process of adoption and investment in agricultural activity by the smallholder farmer. Therefore, there is a need for the program to redesign interventions to ensure that producers, who are currently mostly market-oriented, start to invest more in production as a business and have their income increased. Investing more in production will require additional labour that can be sourced locally creating in this way more jobs.
- Integrated Soil Fertility Management-ISFM (use of mineral and organic fertilizer such as animal manure, crop residue management, the incorporation of legume, intercropping) had a positive impact on the productivity and mitigation pillars of CSA. The employed ISFM in the TEAMS interventions combined with the development of a sustainable market system is showing a positive outcome on the livelihoods and resilience to climate change of farmers in Sofala and Manica.
- The willingness of farmers in purchasing seedlings, improved seed, and fertilizers – despite the cyclones and storms – indicates that farmers have adopted the use of improved technologies for vegetable production as a way of responding to the low production during the rainy season caused by climate stresses and shows a major shift from free distribution towards more sustainable vegetable value chain development.
- The use of resistant and tolerant varieties to climate shocks has proved efficient to boost production in the face of climate shocks. With a focus on rice, where the program promoted varieties developed by the Mozambique's Institute of Agricultural Research – Macassane and Simão varieties, which tolerate floods for more than two weeks – proved to be resilient and productive. These are the varieties currently preferred by producers in the district of Buzi.
- The impact of the TEAMS program on food security to the farmers' communities needs to be monitored through a combined regular collection of basic health indicators (anthropometric parameters) from the representing entities (District Hospital or Health Center).
- Using agrodealers as aggregators of products is viable at an early stage of the business of selling inputs. However, when the business is established and the supply network is functional, this activity, combined with the demand of inputs for intensification of vegetable production, ceases to be seasonal and profitable throughout the year. This makes agrodealers dedicate themselves to selling inputs and less to aggregating products. In addition, the limitations encountered by these agro-dealers for storing the product also constitute a barrier to acting as aggregators. Therefore, there is a need to separate output from inputs approach to overcome the problem of markets in the two provinces through the existing private sector at the local level and off-takers.
- It takes time and much mentoring to get farmers to aggregate. However, most groups have been formed due to program efforts, and it takes time to change farmers' mindsets to realize that the groups can and should be sustainable.
- Negative past experiences with development agencies not fulfilling their promises affected farmer response during Commercialization Campaigns. Farmers are afraid to produce under contract due to unexpected market fluctuations that in some cases have harmed producers due to the breach of the agreement by the buyer. Therefore, it is necessary to

intervene and support farmers and buyers to build trust and maintain a sustainable and functional network.

- DDR beneficiaries need more assistance due to their initial level, needing basic conditions to carry out the agricultural activity. However, too much attention to this group can give the impression that they are special in the community. Hence, the program should explore ways to support the most vulnerable equally through facilitating access to production packages in partnership with the private sector.
- The main challenge working with DDR beneficiaries is managing the individuals' expectations, which are linked to promises and government commitment during the military demobilization process. To overcome this challenge, the program has been working with the focal points of the reintegration process to support ongoing awareness of the program's interventions and objectives.
- The program worked directly with leaders of the groups of ex-combatants to sensitize their fellows on program objectives to manage their expectations in relation to the agreements signed with the government.

6. Risk Matrix

6.1. Table of materialized risks during 2021

Risk Description	Current Status 2021	Impact
Low output demand results in a disincentive for farmers to invest in intensifying production and approaches promoted by the project and boost their farm yields.	The risk has been mitigated by combining the interventions in input supply and output collection markets through the network of agrodealers that are also acting as primary aggregators. Additional, direct linkages between farmers associations and itinerant buyers	Although the impact was low , scaling and consolidation of the approaches will continue to be the focus as larger number of farmers still struggle to sell their produce
Farmer groups have insufficient access to input suppliers to purchase inputs.	The risk is related to both physical and monetary access. For physical availability the program extended agrodealer networks in all districts and localities targeted by the program. TEAMS also trained farmers on the use of locally available inputs such as organic waste to produce organic compost and the use organic manure for vegetable production. The monetary capacity was addressed through the massification of VSLA approach as source of funds to invest on inputs	The impact was down to low
Crops fail due to extreme weather or pests and diseases and farmers achieve poor/no yields, resulting in significantly reduced production and inability to buy inputs.	This risk was abiotic (Tropical Cyclone Eloise and Chalane) and biotic (pests). To address the abiotic risks, we facilitated the access of drought and short duration varieties through the network of agrodealers combined with trainings on CSA through UTTIAs. To address the biotic risks, we facilitated the training on crop diversification into vegetable production and upland crops namely including cassava, orange flashed sweet potatoes and pineapple.	Despite the fact that the first planting were severely affected, the employed strategy help to narrow the impact to medium
Crops fail due to poor management or lack of operation of irrigation scheme.	The risk was prevented by facilitating the introduction of environmentally friendly, low cost, and easy to maintain irrigation solutions, that can be sold by local agrodealers. This was combined with crop diversification	The risk has not been reflected in the program implementation targeted districts
Government and local leaders do not remain supportive of the project.	In fact the Government and local leaders have been very supportive to program activities in the target districts. In addition, an Advisory Board that included the Government members created enabling environment for ownership of the program by government	The risk has not been reflected in the program implementation targeted districts.
Farmers do not or cannot to apply the knowledge gained to invest in more intensive production.	This risk has been mitigated through integration of smallholder farmers into outgrower schemes and on-going Government initiatives e.g. SUSTENTA Project that ensures investment on intensive production. Farmer groups are linked to contract farming. The mini-irrigation systems	The risk has not been reflected in the program implementation targeted districts

Risk Description	Current Status 2021	Impact
	facilitated by the program facilitated the intensification of vegetable productions	
Agribusinesses and output buyers are unwilling to buy from farmers/farmer groups.	The risk was mitigated through the linkages made between farmers and agrodealers that acted as aggregators. Additionally, periodic fairs to sell the produces were facilitated by the program	We narrow the impact to low
Agro-dealers and input suppliers are unwilling to stock the required inputs.	Agrodealers shops showed the commitment of selling the inputs, co-investment etc	The risk has not been reflected in the program implementation targeted districts.
Partners and service providers do not or cannot to provide the necessary support or service to farmers.	The establishment of Advisory Board with members from private sector combined with joining planning, combined with field days raised awareness on the need to provide services to the farmers	The revenue of services provider still low and more work is needed. So we maintain the risk as high
SDAE extension staff do not or cannot apply the knowledge gained to provide extension support to farmers.	All training to farmers, extension officers was done in close collaboration with SDAEs	The risk has not been reflected in the program targeted districts
Low smallholder farmers purchasing power.	This risk has been mitigated through integration of smallholder farmers into outgrower schemes in addition farmers have been also integrated into the SUSTENTA Project that ensures investment on intensive production., In addition, combined with introduction and scaling of VSLA to improve producers' purchasing power were introduced and/scaled	The risk impact has been decreased to medium
Fraud by TEAMS staff, suppliers, and community organizations.	The setup of the code of conduct, guidelines and operational procedures, regular monitoring are measure used to avoid this risk to happen.	The risk has not been reflected in the program implementation targeted districts
Demobilized guerrillas excluded from TEAMS interventions in Sofala and Manica Provinces resulting from an escalation of the guerrilla attacks by Renamo	TEAMS collaborated with PPS in assisting the DDR process through training demobilized guerrillas in climate smart agriculture and business skills as part of social reintegration.	The main challenge working with DDR beneficiaries is managing the individuals' expectations of the program, which are linked to promises and government commitment during the military demobilization process. So the risk can still be considered as high
Health risk for FAR staff - Contamination with COVID-19 of Project staff.	To prevent the risk to happen, the program the program incorporated COVID-19 awareness and practices during the field days and training sessions. In addition, strict measures, as prescribed by the Government of Mozambique, were practiced to prevent the spread of COVID-19.	The risk has not been reflected in the program implementation targeted districts

6.2. Table of remaining risks for TEAMS program implementation

Risk Description	Probability	Impact	Mitigation Strategy
Increasing food prices due to war in Ukraine. Russia and Ukraine represent more than half of the world's supply of sunflower oil and about 30 percent of the world's wheat. Ukraine alone provides more than half of the World Food Programme's wheat supply. The war in Ukraine is triggering a "meltdown of the global economy" – which is provoking a hunger crisis that is hitting the poorest the hardest, warned UN Secretary-General António Guterres in a recent statement	High	High	Increase the local production in areas with high and low agro-ecological conditions for crop production. Diversify crops beyond the staple foods The Introduction of soybeans and intensification of its production will contribute with availability of raw material for oil production and derivatives, as well the increase of household income. The introduction and intensification of flash orange sweet potatoes as well improved varieties of cassava can play important role on reduction of dependency from wheat since the bread industry can mix wheat with the powder of above-mentioned products.
Rising of inorganic fertilizer prices	High	High	Introduce and scaling Integrated Soil Fertility Management adapted to Mozambique context Increase fertilizer use efficiency and dissemination of CSA practices Continuous training and monitoring of adoption of conservation agriculture.
Low availability of fertilizers in the market	High	High	Introduce and scaling Integrated Soil Fertility Management adapted to Mozambique context Explore locally available sources of nutrient such as manure Agro-forestry (combine beneficial tree with food crops)
Extreme weather events (drought)	High	High	Crop diversification; introduction of mini-irrigation systems...agroforestry Tolerant and Early mature varieties combined with monitoring of weather information such as rain fall and temperature.
Increased fuel prices will affect all production chain	High	High	TEAMS is intended to improve the use of renewable energy for farmers. Aggregation facilities will reduce the fuel consumption when taking the products to the market.
Ex-Renamo guerrillas excluded from development program or promised not addressed	Medium	High	Real important to have in the desk everyday

Risk Description	Probability	Impact	Mitigation Strategy
			Always assess their level of satisfaction in regard to TEAMS interventions and provide timely feedback
Floods due to recurrent cyclones	Medium	High	Early mature varieties can help farmers to mitigate, waterlogged rice varieties such as Macassane or Simão that showed their tolerance after the floods caused by Eloise and Chalane Cyclones.
Program			
Stigma and discrimination to person with disability	Medium	Medium	The TEAMS program builds on the strong “leave no one behind” approach ensuring inclusion of persons with disability through voucher schemes. Vouchers can quickly provide recovery to these vulnerable groups. It can also improve the psychological outlook, by engagement in meaningful work
Lack of economic opportunities and perspective for youth	High	Medium	Continue with the integration of youth in the TEAMS interventions either as farmers or services providers
Conflict and insecurity resulting in IDP	High	High	The TEAMS program will support IDPs to restore their livelihood through agricultural interventions/approach

7. Conclusion

The CSA practices and technologies promoted by the program proved to be effective to increase the resilience of farmers and respond to the climate changes. Improving access to climate-smart agriculture inputs and practices for food production and conservation has helped 51% (7832) of the assisted farmers to improve income and food security, becoming more resilient to the impacts of climate change. On the other hand, the crops diversification by intensifying horticulture production through promotion of water harvesting, conservation and environmental friendly irrigation solutions that allowing farmers to produce independently of the rainy season. The diversification of income sources, through the promotion of non-agricultural activities and access to financing through village savings and loan associations, increased the household's capacity to generate income in the face of climatic shocks.

The adoption and incorporation of these technologies into the daily lives of smallholders allowed them to double their productivity for vegetables and improve their income from USD 0.35 per day to USD 1.1 per day at the subsistence level and USD 1.9 per day. For semi-commercial producers, what increased their purchasing and production capacity, as they employ 4 to 8 more vulnerable individuals on a seasonal basis for activities such as weeding in their fields.

The use varieties tolerant to extreme weather conditions and attack by pests and diseases, spraying services combined with post-harvest technologies, reduced product losses by 50%, thus contributing to improving the availability of products for sale and consumption for 75% (11 558) assisted farmers. In addition, the use of post-harvest technologies proved to be effective, allowing 604 women to have a reduction in labor and time for threshing cereals by 85%.

Farmers are buying improved inputs for vegetables production. However, the lack of nearby markets capable of selling large volumes at prices that motivate the producer still causes low investment.

The incorporation of ex-combatants in the TEAMS program showed how inclusive approaches can ensure that no one left behind.

We conclude highlighting that it is possible to address resilience aspect of agritural development in combination with the development of market systems. Insification of smallholder farming systems is valid pathway for local job creations.

Annexes

Annex 1. Annual Financial Report

Annex 2. Photos



Vegetable nursery established by the program in the district of Buzi, community of Guarra-Guarra



Ngatinguare no Badja Association members irrigating with the mini-irrigation system, supported by IFDC



A newly Formed group in Vanduzi district benefiting from low-cost irrigation system, MoneyMaker pedal pumps



Spot marketing moment at Kurima Kunopedza Urombo Famer Organization Group, in Sussundenga district



Smallholder farmers receiving training on vegetable processing in Guara-Guara



Use of maize thresher to reduce labor for women and improve grain conservation with a view to reducing post-harvest losses



Ceremony of inauguration of an improved and resistant input retail storage facility at Bebedo Village by Administrator of Nhamatanda district



Ex-combatants receiving cereal seeds Kit (sesame and maize) in partnership with EASI Seeds and Pannar



Field days on maize in partnership with Bayer (left) and Easi Seeds/Pannar (right)



Green beans UTTIA for the Zama Zama association in Guara-Guara



Women participating in savings groups and accessing finance to invest in agriculture and other small business



Farmer receiving information through IRIPO SMS platform



iDE representative sharing the SMART goal, approach, and areas of implementation of the SMART program



Advisory board members discussing with IOs the challenges of agricultural development and potential solutions



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