

The Mozambique Climate Resilience Program

Activities and lessons learned from the
second year of implementation

1 July 2018 – 30 June 2019



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Introduction

The Mozambique Climate Resilience Program

The impacts of climate change and extreme weather events (droughts, floods, and cyclones) can affect entire harvests for the average smallholder cotton farmer, thus their source of economic livelihood and security; making them extremely susceptible to external shocks. This is the reality for a vast majority of Mozambique's rural population that is dependent upon agricultural production for their source of income – where the average smallholder cotton farmer cultivates 0.8 hectares of cotton, produces 500 kg per hectare, and earns approximately 70 USD – with 25% of the population currently vulnerable to natural hazards and 35% suffering from chronic food insecurity.

Ensuring the resiliency of smallholder farmers against climate change is therefore essential to secure the agricultural productivity and the health and well-being of Mozambique and its people. It requires mitigating the impact of climate change by de-risking farmer livelihoods and maximizing all possible and existing assets. This starts with developing the household and community as a reliable safety net and implementing a holistic livelihood approach for robust asset development and risk mitigation.

At its core, IDH The Sustainable Trade Initiative (IDH), aims to achieve systemic change by changing business practices, improving sector governance, and improving field-level sustainability for smallholder inclusion. By leveraging the power of the private sector and working closely with governments and civil society, we develop and test innovative and inclusive business models that support among other things, intercropping and diversification to ultimately increase sustainable performance and profitability and reduce smallholder farmers' dependency on a single cash crop for their livelihoods. Learnings from our other projects have shown that diversification not only generates additional income and increases price resilience, but also helps to address food security in producing regions.

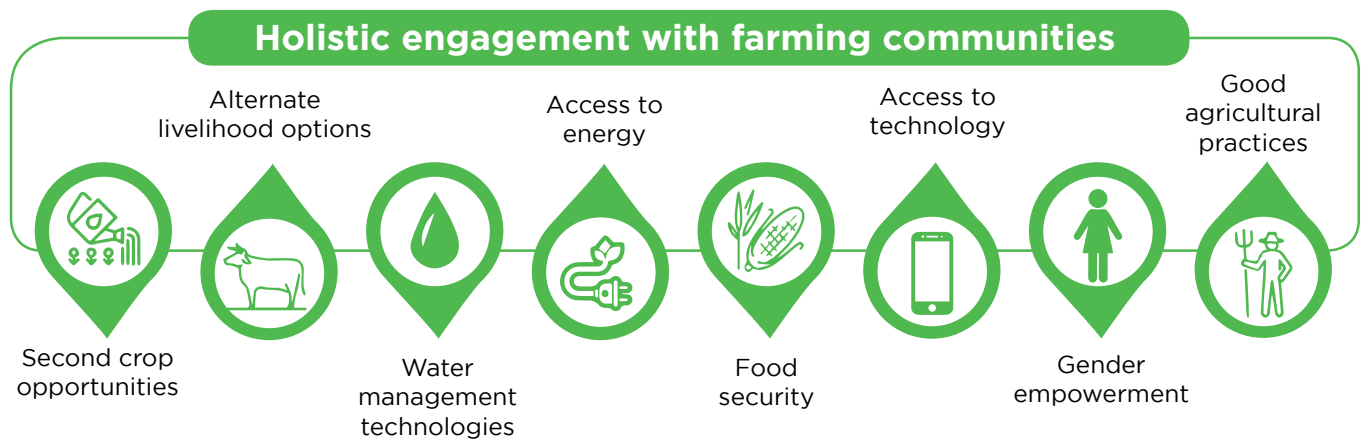
The Mozambique Climate Resilience Program (the “**Program**”) works with four private sector partners to increase farmer resilience against extreme weather conditions and poverty by employing a coordinated and multi-pillar approach leveraging access to water and training on good agricultural practices. In order to increase farmer productivity and provide access to alternative livelihood activities, diversified income, and improved food intake. By equipping farming communities with

the ability to make informed decisions on their farming practices and gain access to multiple livelihood options, households are offered a variety of tools for empowerment and a greater chance to institutionalize a system change for improved livelihoods, increased economic security, and overall improvement in health and quality of life.

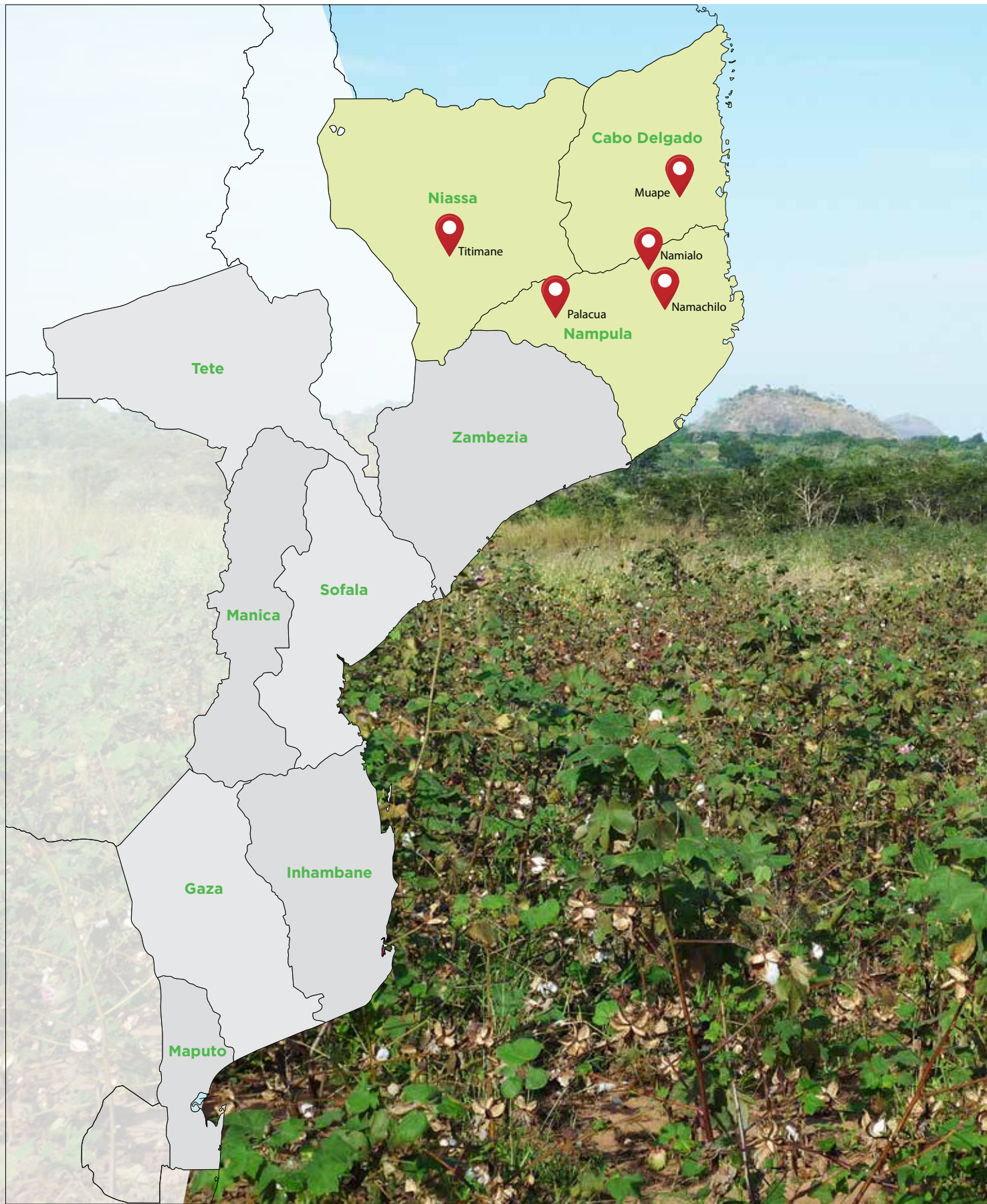
Since the start of the Program in 2016, IDH partnered with Olam, San JFS, Plexus, and SANAM, with additional technical support from Action for Food Production (AFPRO) to develop water harvesting structures and provide smallholder farmers with access to inputs, knowledge training on sustainable cotton cultivation, and technology and information for multiple food cropping and animal husbandry. Five pilot projects are now running to support villages in the provinces of Niassa, Nampula, and Cabo Delgado.

Through the IDH cotton program and the existing collaborations between IDH and the public and private sector with different sector-specific expertise, the Program was developed as a more holistic approach to development and inclusive growth. It promotes and builds on the need to empower farming communities with the ability to make informed decisions as entrepreneurs and community members for achieving long-lasting impact.

IDH supports the Program in its three roles of convening, piloting, and co-funding. The funding structure for the Program and implementation of the projects is based on match funding from the Program’s public funders, the Dutch Embassy of Mozambique and IDH, and private sector partners. It is due to this public-private partnership that innovative approaches like these can be tested for de-risking farmer livelihoods.



Where We Work





Program Deliverables

The first year of the implementation established the foundation of the Program with our partners and communities. It focused on: building the essential water harvesting and soil conservation structures; developing demonstration plots for second crops; providing the initial beneficiaries with goats and chickens; training farmers on water management, good agricultural practices in cotton and second crops, animal and disease management; and providing solar panels to the first set of entrepreneurs and establishing repayment models based on mobile charging units for the communities.

In the second year of the Program, over €385,000 in public and private sector contributions were invested to service 484 direct beneficiaries across the five projects.

With the completion of most water harvesting and water management structures and some re-building required due to unexpected flooding, farmers were able to leverage the available water for cotton production, crop diversification, and animal husbandry activities. Additional support was also provided for the community-level entrepreneurs to increase the availability of solar energy technology services.

A gender study was conducted in partnership with Solidaridad Southern Africa to improve our understanding of the social dynamics within our intervention communities and to help further improve the Program design.

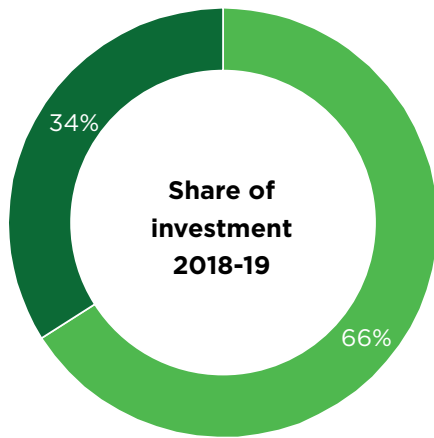
Overall, the Program continues to progress in its second year of implementation, especially at the community level, where water availability has visibly improved living conditions and established new livelihood opportunities in the communities.

IDH and its partners continue to sharpen their understanding of the local realities and evaluate the successes and failures of the implementation activities through continuous engagement with the communities.

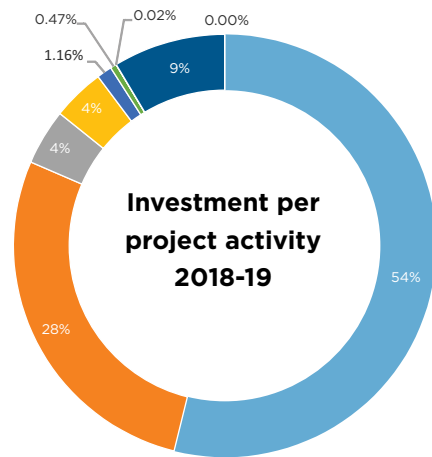
Working across the five project sites and with our private sector partners has proven to be a very effective way of testing the Program's theory of change and understanding the common denominators for maximizing the impact at the farmer and business level. While the pillars of our work remain the same, the local conditions and organizational approach of each of our partners vary. These differences have enriched our experiences, yielding best practices that can be shared with and applied by others.

Progress on program deliverables	
● ● ●	Access to water
● ● ●	Crop diversification
● ● ●	Animal husbandry
● ● ●	Cotton production
● ● ●	Access to energy

- Activity is on-going and on track
- Delay and/or challenges to meet the desired objectives
- Activity is not on track



■ Public sector ■ Private sector



- Creating water source structures
- Building soil conservation & land management structures
- Establishing water irrigation infrastructures
- Provision of services for cotton production
- Provision of services for crop diversification
- Provision of services for animal husbandry
- Generating access to energy
- Gender empowerment
- Service Delivery Model (SDM) Analysis



Improving access to water and minimizing the effects of weather-related shocks and stresses by

Establishing community-based watershed structures

Central to the Program's intervention is the development of water structures for water storage and water management, which can be implemented and maintained at low cost by the communities. The aim here is threefold. First, by creating water structures at the village level, it enables communities to leverage rainwater through water catchment areas and utilize this for an additional 3-4 months after the rainy season to support second crop cultivation. Second, soil and land conservation structures help maintain topsoil and, in the case of excessive rainfall, avoid destructive landslides. Water can thereby penetrate the deeper strata of the soil, replenish underground water reserves, and increase moisture for additional cultivation. Third, by restoring water tanks and water wells, health and sanitation issues are decreased and exposure to waterborne diseases is reduced.

Key activities and lessons learned in 2018-19

In 2018, a total of 68 different structures were developed across five project villages with a capacity of more than 112,000 m³ of water, thereby increasing water storage capacity, improving soil

moisture and fertility, enhancing ground water quality, and increasing access to drinking water and irrigation.

As a result, our partners have reported that farmers are successfully leveraging the additional water and increased soil moisture and fertility for producing second crops and there has been significantly less damage from erosion due to heavy rains which previously not only washed away rich and fertile topsoil but numerous houses as well.

In this second year of implementation we were able to observe visible improvements in the capacity of the partners and local contractors for developing the water infrastructures. Continuous involvement and on-site training helped improve the capacity of the local communities. This is essential for ensuring they have the knowledge and tools to conduct repairs independently in the future. This season, approximately 370 community members across the five villages were involved in the activities with support from AFPRO's engineers.

Community engagement and capacity building is and will continue to be an essential component of the Program for establishing ownership and

ensuring long term sustainability of the structures. While the structures can now be leveraged to harvest additional water in most project sites, natural weathering and sudden and heavy rainfalls will demand additional repair work in the future.

In the coming season, capacity building of communities will focus on water structure maintenance through direct involvement in the repair work and on water resource management with training on water budgeting. This is to ensure communities can estimate and budget for the additional water expected after the rainy season and plan additional livelihood activities accordingly.

This season we also observed increasing interest from local stakeholders and neighboring villages to replicate this model for community-based water-resource solutions in other areas. We are seeing that access to water is becoming an increasingly salient topic of discussion in Mozambique, given that usage of modern or improved technologies and irrigation facilities does not exist in most villages and water resources remain limited in most areas. This increasing interest in our micro watershed approach will require exploring ways to normalize the capital costs and conducting further cost/benefit analyses for scaling up and successfully replicating the Program to new areas.

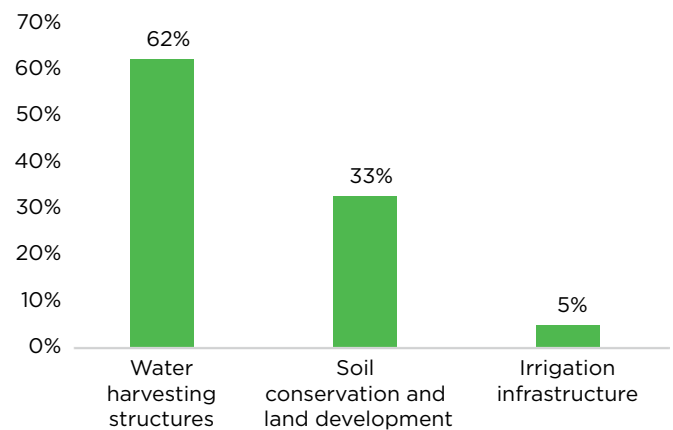
Investment strategy

Investment for creating the water structures continues to account for a significant proportion of the total cost in the Program’s annual budget. To help de-risk the investments made by our private sector partners, IDH, in partnership with the Dutch Embassy of Mozambique, provided match-

funding at a 1:2 ratio in public sector funding. This investment approach has been crucial in securing the involvement and developing the business case for our private sector partners.

In 2018-19, the total investment for creating water harvesting structures, soil conservation and land management structures, and water irrigation infrastructures accounted for over 46% of total costs at Program level. This is a slight decrease since the first year of implementation as in the second year fewer structures were developed. In the coming season, repair and maintenance on the established structures will demand more investment. Investment activities will include strengthening the earthen embankment structures, cleaning of vegetation and silting check dams and farm ponds, providing guidance on soil filing and compaction, planting grass along the structures built in year one and two for greater stability, and repairing and maintaining pipes and pumps for water irrigation.

Investment in water resource development activities 2018-19





Providing alternative livelihood opportunities for increasing income and food security

Diversification of crop production

Crop diversification is not only an effective method for generating additional income and increasing the resiliency of farmers against prices and other shocks, but it also helps to address challenges of food security. This is especially important in Mozambique, where one-third of the population is suffering from food insecurity and low agricultural returns that are unable to support entire households.

As part of this intervention, our partners are providing farmers with agricultural inputs such as seeds, fertilizers, and pesticides, supplemented with training in good agricultural practices to be able to utilize the additional water to grow second crops. By supporting farmers to grow second crops, they can improve their food intake, generate additional income and savings for purchasing goods and services, and develop a financial buffer in case of poor harvests. The combined effect is

then likely to improve farmer productivity and increase production for the benefit of the farmers and our private sector partners, as they see an increase in and more consistent supply of cotton. The combination of the above shall result in more resilient farming systems, communities and business ecosystem.

Key activities and lessons learned 2018-19

In our second year of implementation, our senior agronomist continued to support and monitor the implementation of second crop activities across all villages, providing on-site training and demonstrations at each project site. All activities received additional support from AFPRO, who advised the partners' village coordinators on land preparation, selection of crops and varieties, planting, and irrigation methods. Other training

topics covered included nursery preparation, seedling transplantation, fertilizers and pesticides application, scheduling irrigation, and harvesting procedures.

Across the different project sites, farmers have formed groups with their families to support one another in the cultivation of second crops. In this second year, the farmers have successfully grown and harvested numerous vegetable crops including cabbage, tomatoes, onions, lettuce and other leafy greens, sweet peppers, okra, and maize – as a direct result of the additional water now available. In total, 92 farmers received training on horticultural crops and over 30 hectares of land has been transformed to cultivate additional second crops. Vegetable crops continue to be the best option for generating additional income for the beneficiaries.

The growing success of horticultural cultivation by the leading group of farmers has resulted in positive spill-over effects with other farmers wanting to join the Program to receive training and make use of previously unproductive land.

Our private sector partners have traditionally only sourced and supported the production of cotton with the provision of support and inputs for second crops, which in some cases have gone beyond their expertise. Going forward, if activities are scaled up further, it will require additional support in organizing farmers, providing inputs, and coordinating crop activities.

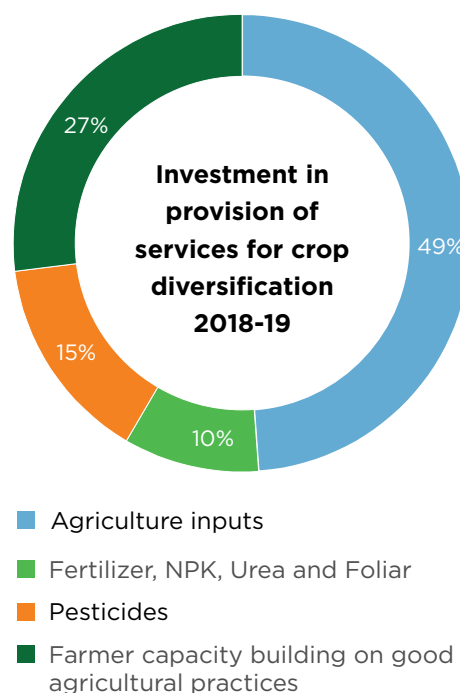
Investment strategy

In 2018, actual investment in providing services for crop diversification was lower than what was budgeted at the start of the season. It was assumed that once the foundation structures were developed in the first year, farmers would subsequently be able to leverage additional water not available previously to further increase horticultural production. However, due to heavy and prolonged rainfall in some areas and lack of rainfall in other areas, additional activities for second crop production were hampered in the second year.

From the second crop activities that were undertaken in the first year, farmers were able to cultivate and harvest additional second crops and generate additional income by selling their produce on the local markets in the second year. It has been reported that the additional income is being saved, either individually or through saving groups, for making longer-term investments.

As a result of crop diversification, families are now also able to consume more vegetables thus increasing intake of essential vitamins, minerals, and proteins. This growing success demonstrates the high agricultural potential that is still underutilized, given that Mozambique still imports most of its vegetables from its neighboring countries.

In the coming year, improving market access for second crops will become an increasing priority as activities scale and for ensuring that second crop activities become a sustainable livelihood activity beyond the initial pilot of the Program. Due to Mozambique’s existing infrastructure, market access remains complex and challenging and will require finding and/or investing in local entrepreneurs as off-takers and input suppliers.



Story from the field

Location: Palacua

Farmer: António Waloha

My family and I used to live through rain fed agriculture results production, where by after rain season no additional agricultural activities was taking place, having reduced opportunities to cover all houses expenses even planning for investments.

With the implementation of this project, my life changed, my family and I can now produce all year long, by producing normal food crops during the rainy season and horticulture during the dry season through the irrigation and water harvesting system created by the project.

We're benefitting from the technical assistance given by Olam team under project, provision of horticulture seeds and other supportive inputs allowed me to produce enough for my own consumption and get surplus to sell to the market and consequently increases my family income. With incomes of the second year under horticulture, apart from buying 2 mobiles for my wife and I, and clothes for my children, I opened a bank account, invested in acquiring and preparing 2 more pieces of land of half a hectare each, to increase the horticulture and other crops production area. I also managed to buy by myself some additional seeds, fertilizers, pesticides and managed as well to produce onion seedling to sell to other farmers. In the 3rd year, I expect to continue with this investment and I'm ready to continue with same after the project. I plan to make savings, build a concrete house and a motor water pump in near future with incomes from horticulture production.





Providing alternative livelihood opportunities for income diversity and food security

Animal husbandry

Animal husbandry, like crop diversification, serves as another alternative livelihood opportunity for many of the smallholder farmers in Mozambique as it requires low investment and takes advantage of locally available resources. Goats and chickens can be a major asset next to farming activities as they can be sold for cash income, traded for other goods or services, and can meet household consumption needs while supplying essential dietary nutrients.

With the increased availability of water through the developed water harvesting structures necessary for successful animal husbandry and to prevent premature death of the animals, our intervention model focuses on providing three additional services for effective and sustainable impact. First, animals are provided to a select group of voluntary beneficiaries that demonstrate interest and motivation to engage in animal husbandry. Self-Help Groups (SHGs) are created to promote a group-based management model to stimulate learning, knowledge sharing, and enabling upscaling of activities. Second, SHGs are trained on good management practices and 1-3 members are

appointed as community veterinarians and receive advanced veterinary capacity building training. Third, SHGs are assisted in the procurement and provision of vaccines, feed, and housing materials for the animals.

Key activities and lessons learned in 2018-19

At the outset of the Program, 94 selected beneficiaries were given goats and chickens and ten SHGs were established and advised on governance structures, roles and responsibilities, and required routines for proper animal health management, housing, and feeding practices. This was further supplemented with training on vaccinations and deworming. In total, 17 community veterinarians have been trained by AFPRO, ensuring at least one individual at each site is available to advise the other beneficiaries on animal health management.

In this second year of implementation, communities received refresher trainings on animal and health management and additional support from local district offices for vaccines and other veterinary

support services. Close coordination and timely communication with local district offices is a fundamental component to successfully implementing this activity and ensuring long-term sustainability. Their timely delivery of vaccines and other support services to prevent severe disease outbreak will be the difference between a small number of losses and the loss of an entire flock of chickens and goats. This season, vaccines were not administered on time and with improper care and management of the shelters for the animals, resulted in more deaths than successful breeding of offspring of chickens and goats.

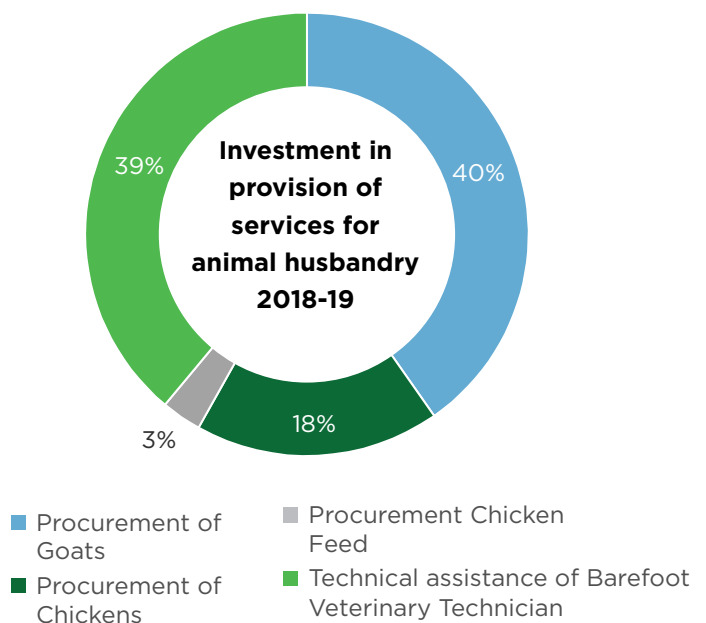
We continue to find individual management of animal husbandry activities is more effective for ensuring proper management of the chickens and goats than enforcing shared responsibility. This coming season, we will continue to explore best practices for individual management and establishing a governance system for distributing successfully bred offspring to new beneficiaries. It was initially assumed that beneficiaries would share the offspring with other community members without formalizing agreements, however, we have observed some instances of this not happening as planned.

Where animal husbandry activities have been successful, we found successful breeding of goats and chickens. The partners report the additional water available through the structures developed in the first year has directly contributed to this by ensuring the animals are sufficiently hydrated throughout the season. Beneficiaries were able to successfully generate additional income through the sale of their goats this season, thus sparking increased interest from other members in the

community to become involved. Beneficiaries from one of our projects successfully donated eight goat offspring to a local rural hospital for training purposes.

Investment strategy

In 2018, less than 1% of total costs were invested in the provision of services for animal husbandry. In the coming season, additional investments may be needed for additional procurement of goats and chickens where breeding has been unsuccessful. This decision will be considered once we are confident the beneficiaries have established the required housing structure to properly manage the animals and agree to a proper governance structure for sharing offspring with others. It will also be essential, that the partners invest in hiring veterinary technicians for additional training and refreshers and provide a buffer for health care costs such as vaccines.





Increasing productivity in cotton: Providing GAP training and access to inputs and markets

Cotton is a major agricultural crop in Mozambique and serves as the main source of income for many smallholder households in central and northern Mozambique. However, cotton production remains stifled by low productivity and fluctuating yields, in part due to low utilization of inputs and technology and poor connectivity and commercialization.

In Mozambique, cotton is produced through a concession model where the government grants a company, usually a ginner, the sole right to operate in a given area. In return, the company guarantees offtake and must provide inputs and extension services to farmers such as seeds, pesticides, and training on Good Agricultural Practices (GAPs).

Understanding that GAPs are an important determinant for cotton yields¹, the Program invests in farmer capacity building according to the Principles and Criteria of the Better Cotton Initiative (BCI) and Cotton made in Africa (CmiA, a BCI benchmark equivalent). Since BCI was first introduced in Mozambique, it has become the first country to fully embed the Better Cotton Principles and Criteria in its national regulations for growing cotton.

By following the BCI standard, cotton concessionaires are providing farmers with training on Integrated Pest Management, water stewardship, soil management, responsible land use and biodiversity, good management practices for preserving fiber quality, decent work, and effective management for continuous improvement.

Key activities and lessons learned 2018-19

During this season, trust and engagement between the cotton concessionaires and farmers continued to improve with increasing appetite and commitment to grow cotton. The partners were able to service a total of 519 farmers compared to 189 farmers in the previous season. The overall area under cotton cultivation increased to 51 hectares, demonstrating a 59% increase against last season. This is the result of increasing farmer confidence in soil conservation and land development activities of the Program and improvements in land management by farmers with better access to extension services along with stabilization of the cotton price.

¹Dalberg, Business validation for climate resilience in Mozambique, 2016 report.

However, despite these visible improvements, heavy and prolonged rainfall and the addition of two cyclones in March and April 2019 greatly affected plant survival and cotton crop productivity. As a result, improving cotton yields continues to be a significant challenge. Moreover, price competition with other cash crops such as maize and sesame continues to cause fluctuations in the number of farmers planting cotton with significant ramifications on the return on investment for the concessionaires.

The coming season will continue to focus on building up the trust and confidence with the farmers, timely supply of inputs and support for weeding and pest management, and training on good agriculture practices. This is essential as the success of the Program is strongly linked to the symbiotic relationship between the cotton concessionaires and the farmers.

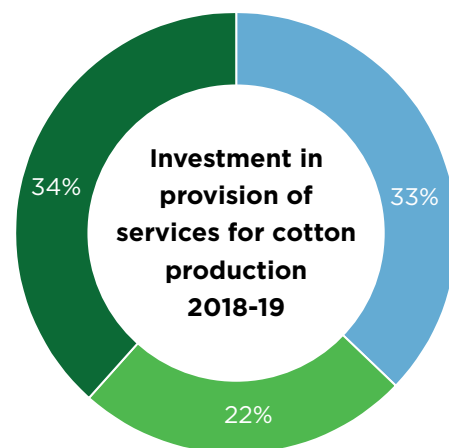
To increase the area of cotton cultivation, improved land use planning through block farming will also be a critical factor for success. This includes: i) early identification of possible cultivation areas around the developed water structures, ii) mobilization and alignment with the farming communities, and iii) providing adequate preparation services and inputs to farmers to enable them to cultivate in new areas.

Investment strategy

In 2018, 4% of total costs was invested in the provision of services for cotton production. Investments went towards provision of farm implements, inputs, and farmer capacity-building training and support.

By working with cotton concessionaires, farming communities have a secure market to sell their products and are guaranteed support to improve their yield. No other market agency in the region is currently promising top-level support to these communities and enabling them to develop a reliable income stream.

The ability to expand the cotton area will depend on the partners' ability to deliver on the managerial tasks required to process additional input requests and trainings across their concession. This comes with challenges in logistics and expansion management which will require additional investment and attention in the coming season.



- Farm implements
- Farmer capacity building (BCI)
- Provision of inputs (seeds, fertilizers, pesticides)



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Providing solar energy capacity and access to technology

Training village-level entrepreneurs in solar energy business models

Access to energy and information technologies are fundamental to building farmer resilience and tackling poverty. Solar energy reduces time lost on collecting firewood and with the additional time gained, more productive activities can be carried out for generating income whether on the farm or in the home.

The Program works with a select number of community-level entrepreneurs, who, with the support of the partners, procured solar kits (including solar panel, battery, and lamps) and set up a repayment scheme that provides energy-based services such as access to solar light and mobile phone charging stations to the community at a service fee. Through this model, the entrepreneurs are now service providers who are generating additional income and providing energy access to the community.

Key activities and lessons learned in 2018-19

In our first year of implementation, three individuals received solar panels with training on operation and maintenance of the solar kits. Now, a total of five households are providing access to solar light and have established charging stations for the community. The partners continue to encourage their community-based entrepreneurs to explore other potential sources of income and to develop their entrepreneurial business models.

Since the first year of implementation, the mobile charging services made available through the solar kits has increased interest in the community to further invest in solar energy and replicate the model. However, the initial investment required is still too high despite the increasing availability of low-cost devices on the market. This is due to

several factors: i) existing entrepreneurs currently do not have enough customers for charging phones or viewing movies to be able to encourage other members of the community to make similar investments, ii) solar kits require reliable and long-term batteries for support; with local markets currently unable to supply these, entrepreneurs face difficulties finding adequate replacements and are unable to provide services at night or on cloudy days in case of battery failure, and iii) lack of technical assistance and maintenance services in the project areas carries limitations for replicating this model to include more household beneficiaries.

In the coming season, we will continue to find solutions for the ongoing challenges and build a stronger business model to expand the activities in the villages and benefit even more community members. If successful, the entrepreneurs could potentially leverage the solar energy for additional functionalities and service even more household beneficiaries. We will also explore the opportunity for the solar entrepreneur to provide services on non-cotton livelihood activities, by empowering the

entrepreneur to become a vegetable offtaker, and to stock and sell inputs for vegetable production and animal husbandry.

Investment strategy

The partners and entrepreneurs developed a business model and repayment mechanism for the solar kits that ensures ownership and long-term sustainability. In this model, the entrepreneurs agreed to pay for 30% to 50% of the cost for the solar panel and equipment which was then match-funded by the Program's investment.

If additional solar kits are procured in the coming season, the Program will consider investing in solar kits where the components (inverter, panel and batteries) can be disassembled and repaired individually. Maintenance on the existing kits has been difficult, in part because the kits were delivered as a unit. As a result, even if only one component required repair or replacing, the kits cannot be disassembled and become entirely unusable.



Digital micro-learning content for more effective farmer capacity building



This year, we partnered with Kuza, a leading social technology enterprise that specializes in developing micro-learning content, to develop digital training materials on: i) good agricultural practices for cotton and three other high-value crops, ii) poultry management, iii) watershed management, iv) farm planning and decision making, and v) crop budgeting and group saving. Additionally, Kuza will provide access to the learning materials through a digital kit that can successfully operate online and off-grid in even the most remote areas of Mozambique. An entrepreneur from each project site will be trained on providing crop advisory services to farmers using Kuza's digital kit, which will be rolled out in November 2019.



The aim of this project is to provide farmers with more dynamic and engaging training material and a platform that allows farmers to learn at their own pace and time, which when combined, will increase adoption of more sustainable agricultural practices leading to improvements in livelihoods and resilience.



Convening Public-Private Partnerships

On 23 May 2019, IDH achieved a new milestone in its partnership with Olam Mozambique, as both parties signed a Memorandum of Understanding (MoU) with the Lalaua District Administration to expand the IDH Climate Resilience Program to an additional area in the Nampula province in North-East Mozambique.

The Lalaua District Administration first expressed interest in working with IDH and Olam Mozambique in November 2018 as a result of our combined efforts in working with a cotton growing community in Lalaua to develop water structures in an area suffering from depleted soil fertility, poor cotton yields, and economic insecurity. They saw the community gain increasing access to water to grow cotton and additional horticultural crops for increased food security and income. This convinced the District Administration to initiate an expansion of this intervention to the surrounding area.

In the coming months, the Lalaua District Administration will play a key role in mobilizing the local communities for effectively implementing the Program. Olam Mozambique will provide technical assistance for Better Cotton production, guarantee offtake for cotton, and explore market linkages for other crops while also providing essential cofunding support for the intervention. IDH is leading development of the project design, convening all necessary activities and actors for successful implementation of the project, and providing cofunding support.

This public-private partnership between the Lalaua District Administration and Olam Mozambique, convened by IDH, will be essential for the successful implementation of this expansion and long-term viability and contingency of the Program. The success of this partnership will contribute to the economy and livelihood of local communities, secure economic resilience, improve food nutrition, and protect the natural resources critical to the future of Lalaua.



Bringing engineering know-how from India

IDH's capacity to develop innovative models for delivering services to farmers depends, to a large extent, on its partners and the solutions they can bring to the table. In the context of the Mozambique Climate Resilience Program, bringing solutions such as watershed development and food security might not have been possible without the inclusion of expert partners such as Action for Food Production (AFPRO) in the global ecosystem of IDH's operations.

AFPRO is a not-for-profit organization registered in 1967. It provides short- and long-term institutional and technical support linked to water, sanitation and hygiene, watershed development and food security, and sustainable livelihoods. The organization consists of hydrogeologists, hydrologists, geologists, geophysicists, civil engineers, sociologists, and specialists in agriculture, fisheries, forestry, and livestock. IDH has worked with AFPRO since 2011 and under the IDH cotton program, AFPRO has been a long-term partner for delivering farming services to more than 64,500 farmers across India.

Once IDH's concept was developed and the intervention logic was validated by a third-party

consultancy, AFPRO agreed to deploy itself in Mozambique for this Program. Its role was first to support the sharpening of the intervention design and then to transfer their knowledge to the local implementing partners. This in turn has helped build their internal capacity for managing field-level implementation.

AFPRO has been actively engaged with the field-level partners to coordinate and provide technical guidance on the implementation of project activities linked to land and resource management, crop production and food security, access to energy, and community capacity building. Additionally, they have provided support in developing a framework to help monitor and evaluate the pilot's overall progress.

In the coming season, skill and knowledge transfer to local technicians will be essential. AFPRO will work with local technicians and build their engineering capacity and knowledge to be able to develop, maintain, repair and monitor water harvesting structures, soil and land development structures and water irrigation infrastructure independently.



Building the business case for holistic community engagement

Central to the Program is to demonstrate to our value chain partners that service delivery is part of their core business rather than merely a way to create farmer loyalty. As such, the Program aims to build the business case for a holistic approach to improve farmer livelihoods and resilience to achieve more consistent cotton seed production and more quality and quantity of seed cotton. The intervention logic is based on the premise that as farmers receive training on good agricultural practices combined with access to water which stimulates alternative livelihoods activities – farmers become more resilient to external stresses and will be able to focus more of their time and attention to grow cotton with improved yield and quality ensuring a more consistent and stable supply of cotton.

To accelerate the learning process, IDH developed a systematic, data-driven approach to understand and improve the business case with the Service Delivery Model (SDM). An SDM analyses all actors, flows of goods, services, and cash flows in relation to the service provider, to understand the costs and benefits of providing additional services (e.g. training, access to inputs, and finance to farmers, improving farmer performance) for both the farmer and service provider, and ultimately demonstrate how the additional services can contribute to the commercial business of the service provider and under what conditions.

In 2017, an SDM Analysis was commissioned by Plexus for the Program, which showed the Program's intervention logic would become economically sustainable and demonstrated a positive return on investment after a few years. The model accounted for higher cotton yields with the construction of additional water sources and soil conservation and land management structures to minimize soil degradation and increase soil moisture. However, the analysis demonstrated the impact on cotton production (higher yield) from the additional water structures is yet to be seen due to other variables falling outside the scope of the Program. Cotton planting is not high enough to cover the cost of infrastructure development at the village level, especially if the cotton business does not diversify and enter into new markets (e.g. animal farming or large-scale production of a second crop).

As the pilot enters its final year of implementation, the intention is to carry out another SDM analysis to assess the benefits for our private sector partners over the course of the Program and see whether changes must be made to increase the number of farmers and their benefits in this business. This will also demonstrate if there is an opportunity for integrating additional activities for value chain development, that could be deployed in Mozambique in the next phase of this Program.



Outlook 2019

The 2018-19 season has been a busy year, filled with achievements and ongoing challenges for the farming communities, the field-level staff, our private sector partners, and IDH.

Over the course of the past two seasons, many lessons have been learned that we will take into the third and final year of the Program to ensure foundations are set for the farmers and cotton concessionaires to continue working together towards improved field-level sustainability and more sustainable business practices.

We have learned that timely provision of inputs (seeds, fertilizer, and pesticides) and extension services (pest/disease management and distribution of vaccines) are fundamental to the success of the interventions for enabling smallholder inclusion, whether it is sustainable cotton production, horticultural production as second crops, or animal husbandry. It requires timely coordination of resources and mobilization of key stakeholders, consistent monitoring and evaluation, and close communication and engagement between all partners. This will translate into greater motivation and trust amongst farmers, concessionaires, and

other local partners, which is essential for the success of any smallholder intervention.

For long term sustainability, it is essential that local community members are engaged and aligned in the process before, during, and after development of the interventions, which is especially relevant for the construction of the watershed structures. Having a capable local leader with strong ties to the community is a key factor for success. Another important factor is capacity building of community members for maintaining and repairing the watershed structures to ensure they are not lost due to natural weathering, perennial weeds, or any other environmental factors. In addition, we have learned that enforcing shared responsibility and ownership of resources (e.g. water pumps, goats, and chickens) is not always the most effective solution for long-term, sustainable resource management. Shared and communal responsibility has resulted in lack of ownership, coordination, and negligence (with the deterioration of water pumps and structures, high animal mortality, and animal offspring not shared/passed down to other members without goats or chickens). Without strong leadership, capacity building, assigned responsibilities, set prior

agreements, and most important, genuine business interest and market linkages the interventions are unlikely to continue once the Program comes to an end.

The IDH Mozambique Climate Resilience Program is a pilot intervention that works with a very select number of farmers in five different villages. While the success of the intervention has benefitted the farmers that are part of the Program, it has also resulted in inequality and competition with farmers from surrounding villages not included in this pilot. Going forward, it is essential that the farmers in this pilot are encouraged to engage in knowledge sharing with others beyond their own communities and for the Program to facilitate learning through farm visits by exemplary lead farmers and between the different project sites.

Building the business case for the cotton concessionaires to deliver holistic engagement with communities, while the case for farmer resilience and impact is strong, still needs to be further developed. It requires finding and partnering with offtakers for horticultural products and further developing these value chains for sufficient income generation, improvement of livelihoods, and more productive cotton production.

Strengthening sub-national government engagement is important for finding an anchor in key governmental departments who are aligned with the Program's goals and objectives and are willing to partner with us to potentially replicate this pilot in other areas, providing long-term support and sustainability once IDH exits. As we are nearing the end of the first phase, partnership development for the second phase of the Program will be crucial this coming season.

This season we will continue to focus on block-farming activities around the established water structures to support cotton production, enabling farmers to benefit from the improved availability of water and soil conditions. Training will be provided to ensure the communities can maintain the

structures independently and carry out resource budgeting and planning.

Crop diversification and animal husbandry activities will be scaled up, strengthened, and institutionalized with the aim of continuing our efforts to build diversified farmer incomes and ensuring food security. The objective will be to expand the number of participating farmers and improve organizational structures to enable them to carry out these activities independently.

Other supplementary activities of the Program will be further tested and developed in this third and final season for creating financially self-sufficient business models to stimulate local entrepreneurship. This will include the provision of solar panels, supporting women self-help groups for increased participation, and piloting a digital technology platform to support development of solar-entrepreneurs.



Annex 1: Program KPIs

Output Indicator	Unit	2016 Baseline	2017 Actual	2018 Actual
Water Resource Development				
Water harvesting & soil conservation structures constructed	No.	0	39	68
Area under irrigation	Hectares	0	32	51
Volume of water harvested	m ³	0	55,700	112,786
Soil conservation & Land Development				
People engaged in construction and maintenance	No.	0	240	375
Alternative livelihood: Crop Diversification				
Farmers trained on crop diversification / second crops	No.	0	16 (10M/6F)	92 (69M/23F)
Area cultivated for second crops	Hectares	0	1.5	7.6
Volume of second crops harvested	Kg	0	20.5	Not yet available
Alternative livelihood: Animal Husbandry				
Total beneficiaries trained on animal husbandry services	No.	0	129	94
Male beneficiaries trained on goats/sheep	No.	0	85	45
Females beneficiaries trained on poultry	No.	0	44	49
Self Help Groups for animal husbandry	No.	0	8 (4M/4F)	10 (5M/5F)
Cotton production				
Farmers trained on Better Cotton Initiative (BCI) and Cotton made in Africa (CmiA) standard	No. (M/F)	189 (154M/35F)	189 (162M/27F)	519 (429M/90F)
Area under sustainable production	Hectares	121.5	137	240
Volume of sustainable production	Metric Tons	65	27	87
Access to energy				
Households equipped with solar energy kits	No.	0	3	4

Colophon

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Disclaimer:

Although every effort has been made to ensure the content of this report is up to date and accurate, errors and omissions may occur.

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