the sustainable trade initiative

The Mozambique Climate Resilience Program

Activities and lessons learned from the third year of implementation.

1 July 2019 - 30 June 2020

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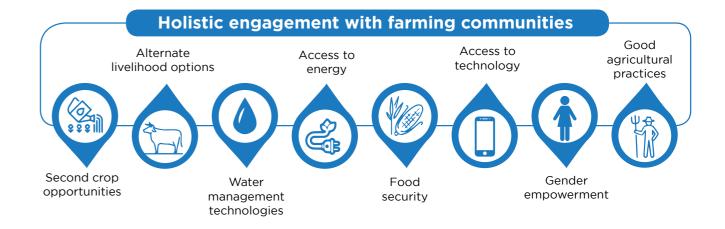
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Introduction

IDH, the sustainable trade initiative, was established in 2008 to bring governments, companies, civil society organizations (CSOs), and financiers together to contribute to the Sustainable Development Goals (SDGs) by designing, co-funding, and prototyping innovative and economically viable solutions for global sustainability issues at scale.

As of 2019, IDH has convened over 600 publicprivate partnerships with over 50 governments, 500 businesses, and 35 non-governmental organizations (NGOs). Across our global portfolio, including 12 sectors and 16 landscapes in over 40 countries worldwide, we leveraged EUR 46 million in private sector investments to train 3.6 million producers and workers on sustainable agricultural practices to produce 7.9 million metric tons of sustainably-produced agri-commodities covering 9.5 million hectares of land. IDH has shown that when the right incentives are created and innovative and effective tools are provided, businesses will be the drivers of sustainable market transformation - the benefits of which are felt by businesses, farmers, workers, and our natural resources.

Since 2016, IDH has been working in Mozambique with public and private partners to pilot and scale solutions for rural transformation through sustainable and inclusive economic development. The Mozambique Climate Resilience Program (the "Program") implements a cluster-based, rural economic-development program where we leverage funding from public donors, the Dutch Embassy in Mozambique, and IDH to match private-sector investments that de-risk smallholder-farmer livelihoods from the impact of climate change and climate variability by promoting scalable and cost efficient rainwater harvesting and soil management solutions to increase productivity and yield, to strengthen water and food security, and to catalyze income diversification with additional livelihood opportunities including crop diversification and animal husbandry.

At a strategic level, IDH has led the design and implementation of the Program. We co-finance field-level implementation alongside our private sector partners to de-risk their investments and convene all partners around shared sustainability commitments and targets, holding smallholder inclusion and living income at the heart of the engagement. At field level, we also provide technical backstopping support and are piloting digital innovations in micro-learning for farmer capacity building.

Our Partners

Public-sector Partners

The Embassy of the Kingdom of the Netherlands

The Embassy of the Kingdom of the Netherlands in Maputo, Mozambique is our key public donor and convenes the annual Mozambique Climate Resilience platform meeting to stimulate dialogue and exchange best practices with other relevant stakeholders active in the region.

Local District Government

The local governments in Monapo and Lalaua districts, Nampula province, Cuamba district, Niassa province, and Balama district, Cabo Delgado province support the initiative by providing technical assistance and extension services. Additionally, they offer essential support for mobilizing the rural communities to support and maintain the development of the water resources for long-term sustainability.

Private-Sector Partners

In this partnership, we work together with four private-sector partners representing Mozambique's largest cotton-producing, processing (ginning), and lint trading companies. All four companies, under Mozambique's concession system, support smallholder farmers with extension services including input provision and training on sustainable agricultural practices. Alongside the public funders of this program, they likewise co-invest in the development of water resources and alternative livelihood activities to improve cotton productivity and output while simultaneously diversifying farmer crops, income, and strengthening their livelihoods.

San JFS (Sociedade Algodoeira do Niassa JFS),

based in the northern province of Niassa, supports 42,000 farmers for cotton cultivation across 35,000 hectares annually.

SANAM (Sociedade Algodoeira de Namialo),

based in the northern province of Nampula, supports 48,000 smallholder farmers for cotton cultivation across 40,000 hectares annually. **Plexus Mozambique**, based in the northern province of Cabo Delgado, supports 72,000 farmers for cotton cultivation across 60,000 hectares annually.

Olam Mozambique, based in the northern province of Nampula, supports 30,000 smallholder farmers for cotton cultivation across 25,000 hectares annually.¹

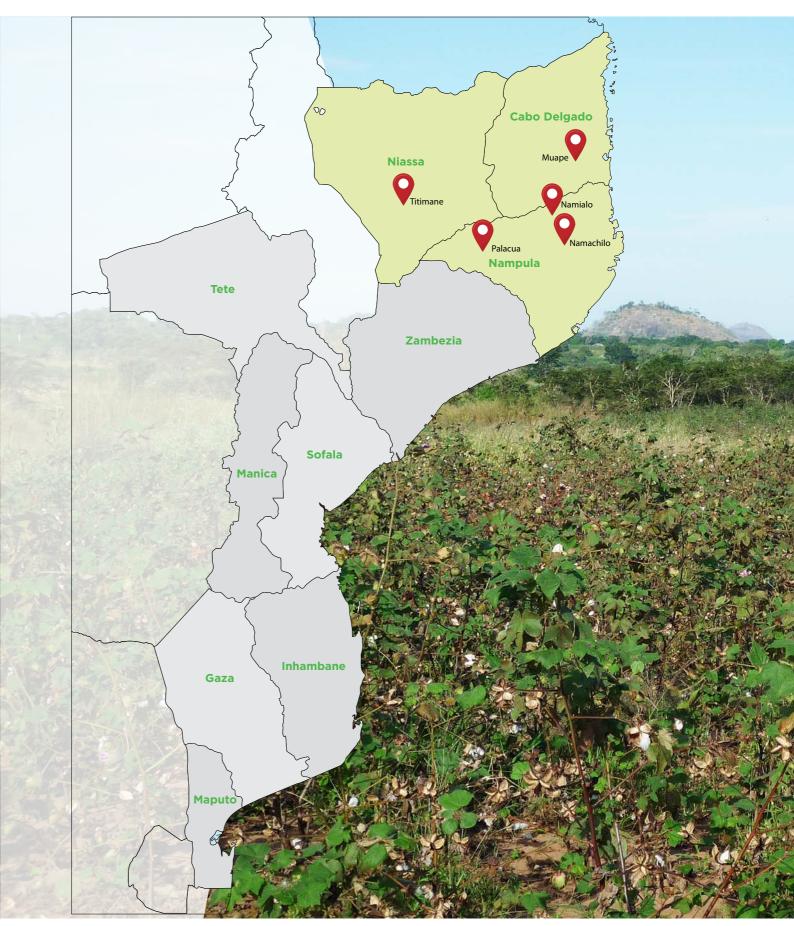
Civil Society Partner

Action for Food Production (AFPRO) is a nonprofit organization based in India, specializing in developing cost-effective rainwater-harvesting solutions and providing training to farmers on water management, water budgeting, and crop planning. AFPRO has co-designed the framework of this pilot intervention and provides ongoing technical backstopping support to the Program's Implementing Partners in the development of the water resources. To ensure long-term sustainability, AFPRO is currently actively involved in facilitating knowledge transfer and capacity building in water resource development of local resources in Mozambique.

Social Enterprise Partner

Kuza Biashara is a social-development enterprise specializing in developing digital micro-learning content tailored to the needs of farmers. In partnership with Kuza, we developed highquality digital-learning materials for farmers to provide access to knowledge and supplement field training in remote areas without requiring access to electricity or the internet. The learning materials developed in the pilot phase include lessons on water management, integrated crop management, pest management, crop planning, farm management, and animal husbandry.

Where We Work



¹As of mid-2019, Olam has been undergoing internal restructuring to sell their concession rights. This resulted in less program support in Lalaua and Palacua.



Program Deliverables

Volatile weather patterns caused by climate change are negatively impacting smallholder farmers globally, with increasing exposure to extreme weather events and resulting in an array of sustainability challenges affecting yield, productivity, and overall livelihoods. In response, the IDH cotton program established a pilot program in Mozambique to develop the business case for holistic investment in smallholder cotton-farmer livelihoods by convening a multi-stakeholder platform in close collaboration with state government and private-sector supply-chain partners on rural transformation and development of agribusiness.

In the first year of implementation, the foundation of the Program was established 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 (GAPs) in cotton and second crops, and animal and disease management; and equipping communitybased entrepreneurs with solar panels as well as establishing repayment models based on mobile-charging units for the communities.

In the second year of the Program, following the completion of the water-harvesting and water-management structures, farmers were able to leverage the available water for cotton production, crop diversification, and animal husbandry activities. We observed visible improvements in living conditions in the communities as a result of the additional

water available to both farmers and community members for farming, drinking, washing, and other activities.

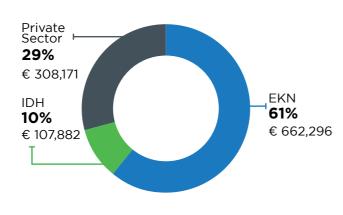
Progress on program deliverables			
	Water management		
	Crop production		
	Crop diversification		
	Alternative livelihood activities (animal husbandry)		
	Access to energy		

Activity is on-going and on track

Delay and/or challenges to meet the desired objectives

Activity is not on track

Program investment 2017-20



Total investment € 1,078,348

In the third year of the Program, field activities continued to be monitored closely. IDH and its partners focused its community engagement on local capacity-building activities to ensure farmers and community beneficiaries can maintain the water catchment areas, second cropping activities, and animal husbandry for long-term sustainability post-pilot. IDH partnered with Kuza Biashara, a social-technology enterprise, to develop digital micro-learning content providing farmers with more dynamic and engaging training material, online and offline, for better adoption of sustainable agronomic practices.

Across Nampula, Niassa and Cabo Delgado, over 140,316 m3 of water previously unavailable is now being leveraged for cotton production, crop diversification, and animal husbandry and is servicing over 3,000 community members. Over 300 smallholder farmers have received training on sustainable agricultural practices in cotton and secondary crops based on village-

Program Output

140,316 m³

Volume of additional water harvested with 82 waterharvesting structures

178

Cotton farmers trained on GAP according to BCI and CmiA standard, using the digital micro-learning solution

413

Beneficiaries of animal husbandry services

159 Cotton farmers trained on crop diversification for improved food intake and income diversification, using the digital micro-learning solution

14

Self Help Groups for resource management

68 Ha

schemes

level cropping patterns and 14 self-help groups have been instituted for sustained water-resource management and expansion of the animal husbandry activities. In combination with input provision for second crops by our private-sector partners, farmers have successfully produced tomatoes, onions, and cabbage for additional income and food intake. Prior to the Program. these same farmers did not have access to such livelihood activities.

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 levels. 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 to be developed into a standard operating guide postpilot.

Hectares of land under irrigation with 13 irrigations

3,022

Community members having access to water

212

Metric tons of second crops produced for food intake and income diversification

9

Solar energy entrepreneurs servicing local communities



Improving access to water and minimizing the effects of weatherrelated shocks and stresses by establishing community-based watershed structures

Key activities and lessons learned in 2019-20

Within a period of three years, across five project villages in Nampula, Niassa, and Cabo Delgado, IDH and its partners successfully developed 82 water-harvesting structures along with 5,200 meters of trenching, 2,600 meters of farm and contour bunding, and 38 gully plugs for soil and water conservation, creating access to water for over 3,000 rural community members and enabling more than 150 farming households to leverage over 140,316 m3 of water previously lost to surface runoff. This has translated to an additional 3-4 months of water after the rainy season to support and improve cotton production, second crop cultivation, and animal rearing.

By investing in a combination of cost-efficient water-harvesting and irrigation structures and soil and water-conservation structures, the Program has been able to increase the resilience of farmers and rural communities against the effects of heavy rains and erosion as well as extended periods of drought. This is seen with the significant increase in water-storage capacity, soil moisture and fertility through improved productivity, enhanced groundwater quality, and access to drinking water and irrigation facilities.

As natural weathering and sudden and heavy rainfall will demand maintenance and repair of the established structures, capacity-building activities focused on training and equipping farming communities with the skills and knowledge to conduct repairs independently, and providing training on water-budgeting and resource management to ensure farming households can estimate and budget available water for farming activities and avoid excessive irrigation early in the season. These activities have established local ownership and will ensure long-term sustainability of the structures in the future.

Total number of water-harvesting structures

Earthen	emban	kments
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1 ('h	neck	da	mc
	IECN	ua	1115

Farm ponds

Open wells

Artificial recharge borewells

Irrigation pumps

Total number of soil and land-conservation structu

Trenching

Farm bund and contour bund

Gully plugs

5
8
9
6
3
13

ires	
	2,600 m
	17,807 m
	38



Providing alternative livelihood opportunities for increasing income and food security: diversification of crop production

Key activities and lessons learned 2019-20

By investing in low-cost rainwater-harvesting solutions to increase water availability, farmers are now able to engage in off-season farming utilizing land previously left unproductive and idle. The results are additional productivity and income and improved nutritional intake through crop diversification.

This season, as a direct result of the additional water availability combined with training on crop diversification and the provision of inputs for second crops, farmers successfully produced close to 212 metric tons of vegetable crops including tomatoes, onions, cabbage, lettuce, and sweet pepper. In total, 159 farmers received training on crop diversification including nursery preparation, seedling transplantation, fertilizer and pesticide application, irrigation scheduling, and harvesting procedures.

IDH's 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 and advising farmers directly on land preparation, selection of crops and varieties, planting, and irrigation methods. Increasingly, other farming communities are noting and observing the success of the farmers involved in the Program and are engaging with lead farmers to learn and share best practices for crop diversification.

In Mozambique, one-third of the population is suffering from food insecurity and low agricultural returns unable to support entire households. For this reason, crop diversification serves as an effective method for generating additional income and increasing the resiliency of farmers against prices and other shocks while addressing challenges of food security.

As our private-sector partners support farmers to grow second crops through the provision of inputs, farmers can diversify their food intake, generate additional income and savings for purchasing goods and services, and develop a financial buffer in case of poor harvests. In turn, this enables higher productivity and yield as well as incentivizes farmers to grow cotton for more consistent supply and quality – benefitting both farmers and cotton concessionaires, resulting in more resilient farming systems, communities, and business ecosystems.

A Story from the field

Location: Namialo

Farmer: Mr. José Mathanlela

My name is Mr. José Mathanlela, I live at the Netia-Sede Administrative Post in the Nampaua neighborhood and own and farm 5 hectares of land. Prior to joining the Program, I lacked knowledge on good agricultural practices and on managing cotton related pests. By participating in this Program, I have been able to learn more about early sowing, recommended crop density, using a compass between plants, weeding and when best to do it, and proper pesticide application. Through the additional income I've been able to generate, I've been able to buy zinc sheets to cover my home, a mattress, bed, plastic chairs, and some home utensils. I was also able to help my mother construct her home.





Providing alternative livelihood opportunities for income diversity and food security: Animal Husbandry

Key activities and lessons learned in 2019-20

The Program began with 129 initial beneficiaries of goats and chickens, training on managing animal health and feeding practices, and support on the development of proper shelters and training of community veterinarians. To date, the Program has been able to successfully expand its animal-husbandry activities to 413 beneficiaries through successful breeding and distribution of offspring to new beneficiaries.

Post-pilot, close coordination and timely support from local district offices for vaccines and other veterinary support services will continue to be essential for ensuring long-term sustainability. Their prompt 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. Individual management of animal-husbandry activities continues to be more effective for ensuring proper management of chickens and goats than sharing responsibility. As the Program comes to an end in 2021, the Program will look for ways to institutionalize a governance system for distributing successfully-bred offspring to new beneficiaries and establish 'lead farmers' to support and share best practices for the individual management of goats and chickens.

Like crop diversification, animal husbandry is proving to be a successful livelihood activity and income asset next to farming – at relatively low costs. Goats and chickens are being sold for cash income, traded for other goods or services, and helping to meet household consumption needs while supplying essential dietary nutrients.

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

Key activities and lessons learned 2019-20

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) according to the Principles and Criteria of the Better Cotton Initiative (BCI) and Cotton made in Africa (CmiA, a BCI-benchmark equivalent).

This season focused on escalating the trust and confidence between the farmers and cotton concessionaires through the timely supply of inputs, support for weeding and pest management, and training on GAPs. While trust and engagement continued to improve with an increased willingness and commitment to grow cotton, price competition with other cash crops such as maize and sesame continues to cause fluctuations in the number of farmers planting cotton with significant effect on the return on investment for the concessionaires. Within the farming communities participating in this pilot, the partners serviced a total of 178 farmers compared to 517 farmers in the previous season. The overall area under cotton cultivation decreased to 35 hectares, demonstrating a significant loss against last season.

The significant drop in farmers producing cotton this season can also be explained by the fact that as of mid-2019, Olam - servicing two project sites in Palacua and Lalaua in Nampula province with over 400 farming families - has been undergoing internal restructuring to sell their concession rights. This resulted in significantly reduced program support in the third year of the Program. In the coming season, the Program will work together with the new concession owner to ensure farmers in Palacua and Lalaua are sufficiently serviced. To increase the area of cotton cultivation, improved land use planning through block farming will also be explored further. 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.



Providing solar-energy capacity and access to technology: training villagelevel entrepreneurs in solar-energy business models

Key activities and lessons learned 2019-20

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 nine households are providing access to solar light and have established charging stations for the community.

To address the challenges faced in previous seasons, the Program is working together with the entrepreneurs to find solutions for building a stronger business model to service an increasing number of household beneficiaries while potentially expanding their services on non-cotton livelihood activities by empowering the entrepreneurs to become vegetable offtakers and stocking and selling inputs for vegetable production and animal husbandry. 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 implemented for generating income whether on the farm or in the home. San JFS, cotton concessionaire based in Titimane, successfully established an incentive system where they provide access to electricity (with the provision of a solar-energy system) to cotton farmers on a credit or half-price basis, given the condition that cotton is grown for two seasons thereby creating a win-win situation for both farmer and cotton concessionaire. Further opportunities for replicating this business model will be explored in the coming season.

Developing digital micro-learning content for more effective farmer capacity building

This season, IDH partnered with Kuza Biashara, a leading social-technology enterprise specializing in developing digital micro-learning content, to develop tailored learning content for supplementing farmer capacity-building trainings for better learning and adopting more sustainable agricultural practices.

In February 2020, IDH and Kuza launched the Mozambique Climate Resilience digital microlearning toolkit, consisting of 46 micro-learning videos for farmer capacity building in watershed management, animal husbandry, and good agricultural practices in cotton, maize, tomatoes, and cabbage.

The toolkit will play a key role in improving the delivery and scale of farmer capacity building under the Program. Agricultural extension workers engaged by the Program's Implementing Partners will use the toolkit to train farmers and help them deliver uniform trainings, in quality and understanding of key agronomic practices.

The toolkit consists of a wireless hard drive, projector, white screen, and tablet and will be used by the extension workers to supplement their farmer trainings. The toolkit enables extension workers to access and screen tailormade digital micro-learning videos on good agricultural practices in the field – in even the most remote areas of Mozambique without requiring access to internet or electricity.

In the coming season, IDH and Kuza will continue to explore additional partnerships in Mozambique for scaling up the digital toolkit. Next steps will include translation of the digital learning modules into local language(s), for more effective penetration with the rural communities, as well as the development of learning modules on additional crops such as rice, soy beans, maize, sesame, pigeon peas, cowpeas, sunflower seeds – based on a needs assessment.





Building the business case for holistic community engagement

Central to the Program is demonstrating 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 cotton supply.

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 analyzes 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, which improves farmer performance) for both the farmer and service provider. Ultimately, this demonstrates 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 participate in 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 for deployment in Mozambique in the next phase of this Program.

Outlook 2020-21

The 2019-20 season has been an exciting year, filled with achievements as well as ongoing challenges for the farming communities, fieldlevel staff, our private-sector partners, and IDH.

Over the course of the past three seasons, many lessons have been learned that we will take into the final year of the Program to ensure foundations are ready for the farmers and cotton concessionaires to continue working together towards improving field-level sustainability and more sustainable business practices. One of the key deliverables will be to establish an SOP guideline for cultivating cost-efficient rainwaterharvesting solutions based on the Program's experience and learnings in Mozambique. This will be accomplished in partnership with AFPRO and will be made available for all partners looking to replicate the model in other regions of the country.

As we dive into the priorities of the upcoming season, we take this opportunity to reflect on our achievements to date. The Program was developed as an innovative pilot, working with a very select number of farmers in five different villages, employing a coordinated approach to support the inclusion of smallholder livelihoods while generating economic growth for our private-sector partners.

Since the launch of the Program in 2017, the partners have collectively invested over EUR 1 million in creating rainwater-harvesting resources, soil and water-conservation management structures, providing services for cotton production, crop diversification, and animal husbandry, and generating access to knowledge for farmer capacity building. Original investments were partitioned into 29% from our privatesector partners, 61% from the Dutch Embassy in Mozambique, and the remaining 10% from IDH. Through this collective investment and effort from both the public and private sectors, across the provinces of Nampula, Niassa, and Cabo Delgado we now have:

- Rainwater harvesting, water irrigation, and soil-conservation structures that remain operational and are maintained by the farmers and surrounding community members
- Farmers seeing the value of second crops and investing in crop-diversification activities independently
- Livestock beneficiaries successfully producing offspring and passing down offspring to new beneficiaries in the community and communities consuming and selling livestock products for nutrition and income generation
- Private-sector partners seeing the added value of investing in a holistic livelihood approach with increasing farmer loyalty, productivity, and cost-saving from previously needing to transport additional water resources

Each project site operating independently, ٠ receiving minimal technical backstopping support from IDH and AFPRO

To build on these successes as we go into our final season of implementation, the Program 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. Field-level support will be provided to ensure the communities continue to maintain the structures independently and carry out resource budgeting and planning.

Crop diversification and animal-husbandry activities will continue to be monitored, strengthened, and institutionalized with the aim of enabling farmers to continue these activities independently post-pilot for income diversification and ensuring food security. The Program will endeavor to identify lead farmers to act as focal points for the communities to build on the practices and interventions established throughout the duration of this Program. Together with the concessionaire's extension workers, they will be equipped to maintain and advise the ongoing field activities post-pilot.

The Program will work with the solar entrepreneurs to solidify their business model and explore opportunities for expanding their services beyond solar charging. The established self-help groups will continue to be monitored and supported to stimulate active participation by the rural communities.

Together with Kuza and the cotton concessionaires, the digital micro-learning toolkit will continue to be implemented for supplementing farmer capacity-building training to ensure farmers receive the skills and knowledge for maintaining and further developing their second crop and animalhusbandry activities, even without IDH field presence.

Finally, the Program will further strengthen subnational government engagement to establish an anchor in key governmental departments who are aligned with the Program's goals and objectives to provide longer-term support and sustainability once IDH exits.

IDH looks forward to another successful season of implementation and working together with our private-sector partners, AFPRO, and Kuza to support smallholder livelihoods in Mozambique.



Annex 1: Program KPIs

Output Indicator	Unit	2016 Baseline	2017 Actual	2018 Actual	2019 Actual	Total
Water resource develop	ment					
Water harvesting and soil-conservation structures constructed	No.	0	42	38	2	82
Area under irrigation	Hectares	0	32	19	17	68
Volume of water harvested	m³	0	55,700	44,000	40,616	140,316
Soil conservation & Lan	d Developme	nt				
People engaged in construction and maintenance	No.	0	240	375	1,150	1,765
Alternative livelihood: 0	Crop Diversifi	cation				
Farmers trained on crop diversification / second crops	No.	0	16 (10M/6F)	92 (69M/23F)	159 (122M/37F)	159 (122M/37F
Area cultivated for second crops	Hectares	0	1.5	7.6	5.4	14.5
Volume of second crops harvested	MT	0	20.5	57.7	148.5	212.2
Alternative livelihood: A	Animal Husba	ndry				
Total beneficiaries trained on animal husbandry services	No.	0	129	94	190	413
Male beneficiaries trained on goats/sheep	No.	0	85	45	86	216
Females beneficiaries trained on poultry	No.	0	44	49	104	197
Self Help Groups for animal husbandry	No.	0	8 (4M/4F)	10 (5M/5F)	14 (7M/7F)	14 (7M/7F)
Cotton production	Cotton production					
Farmers trained on Better Cotton Initiative (BCI) and Cotton made in Africa (CmiA) standard	No. (M/F)	207 (167M/40F)	168 (142M/26F)	517 (427M/90F)	178 (126M/52F)	178 (126M/52F)
Area under sustainable production	Hectares	122	137	240	35	35
Volume of sustainable production	Metric Tons	65	27	87	11	11
Access to energy						
Households equipped with solar energy kits	No.	0	3	4	2	9



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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