

Business Model Review

Looking back on the Mavuno Zaidi project; 3 years of building a service coalition for tomato and potato farmers to access finance, inputs and markets

Syngenta Kenya

Public report

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idh
transforming markets

syngenta





Disclaimer

This study examines the projected (financial) performance of Syngenta's business model and compares it to an initial, similar analysis that was done in [2019](#). The findings in this report have been used by IDH, Syngenta and involved value chain players to shape their strategy, project design, and future business models, but these organizations cannot be held accountable for meeting any targets included in the report.

The contents of this report are intended for informational purposes only. While every effort has been made to ensure the accuracy and completeness of the information presented, the analyses in this report rely partially on projections and assumptions. The conclusions and recommendations in this report are based on our best knowledge and expertise at the time of preparation, but their applicability or accuracy in any situation or circumstance cannot be guaranteed. No rights can be derived from the information provided in this report.

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Data Limitations

Challenges in Agricultural Data Accuracy

Agriculture is inherently dynamic, influenced by various external factors such as weather, market conditions, and unforeseen events. Recognizing the inherent variability, some values presented as actuals are based on averages to reflect the dynamic nature of agricultural outcomes

Data Source Variability

Part of the data used for the report is self-reported by the company. While efforts have been made to validate and cross-reference the provided data, reliance on self-reported data introduces subjectivity and potential bias

Recommendation for Caution

Acknowledging these uncertainties, the values presented should be interpreted with caution and understanding of the potential margin of error inherent in agricultural reporting. Consider the data as indicative rather than absolute.

Our commitment to transparency and accuracy drives ongoing efforts to enhance data quality and reliability in future reports. Feedback and collaborative effort with stakeholders in the sector are encouraged and appreciated to refine our understanding of agricultural reporting intricacies and to improve the accuracy of future reports.

IDH Farmfit

IDH Farmfit Business Support is an initiative funded by FCDO and BMGF that offers business analytics and technical assistance to agri-food companies to enhance their business models for sourcing and service delivery to smallholder farmers. The program aims to increase the farmers' income while also improving the efficiency and commercial viability of the companies.

The business analytics are based on data-driven methodology, which analyzes smallholder engagement strategies. It is designed to help businesses understand the conditions that will improve efficiency, cost-effectiveness, and a sustainable return on investment. The Analytics complements technical assistance support for agri-food companies to pilot or scale process and technology innovations that can create a positive impact for farmers and businesses“

Mavuno Zaidi™ started in 2014 by Syngenta East Africa and primarily was targeting farmers in the potato and tomato value chain in Kenya. It had 3 main objectives: affordability (access to finance), access to information, and access to market.

In the collaboration with IDH from 2020 to 2023, the project aim was to improve Syngenta's business and service model, which supports smallholder growers to increase yield and improve livelihood. The project focused on 8 counties in Kenya. The collaboration as to scale-up operations to reach 52,000 farmers by 2022 building from the foundation set from 2014.



IDH Inclusive Business Analysis

Smallholder livelihoods

Agriculture plays a key role in the wellbeing of people and planet. 70% of the rural poor rely on the sector for income and employment. Agriculture also contributes to and is affected by climate change, which threatens the long-term viability of global food supply. To earn adequate livelihoods without contributing to environmental degradation, farmers need access to affordable high-quality goods, services, and technologies.

Inclusive Business Models

Inclusive Business Models are supply chain structures which provide farmers with services such as training, access to inputs, finance and information in addition to sourcing products from these farmers. Inclusive Business Models can sustainably increase the performance of farms while providing a business opportunity for the service provider. Using IDH's data-driven Inclusive Business Model methodology, IDH analyzes these models to create a solid understanding of the relation between impact on the farmer and impact on the service provider's business.

Insights & Innovations

Our data and insights enable businesses to formulate new strategies for operating and funding service delivery, making the model more sustainable, less dependent on external funding and more commercially viable. By further prototyping efficiency improvements in service delivery and gathering aggregate insights across sectors and geographies, IDH aims to inform the agricultural sector and catalyze innovations and investment in service delivery that positively impact people, planet, and profit.

Outline

- 1 Executive summary
- 2 The Business model
- 3 Business case

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- 5 Annex





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Executive summary



- **Syngenta** (SYT) is a leading global agribusiness that produces seeds and crop protection products. It was formed in 2000 by the merger of Novartis, Agribusiness and Zeneca Agrochemicals. In 2017, Syngenta was acquired by ChemChina, a Chinese state-owned enterprise. Overall, Syngenta employs over 59,000 people across more than 100 countries.
- SYT's products include herbicides, fungicides, insecticides, seed treatments, biologicals, crop enhancement, seeds and traits. Revenues in 2022 were \$16.3 billion and \$4.7 billion from crop protection and seed sales, respectively. Syngenta sells to small, medium and large-scale farmers.
- Besides products, SYT offers services such as agronomic advice, grower programs and stewardship. Through these services, Syngenta is focused on strengthening its position as responsible innovator in the global agricultural sector.
- SYT has worked with over 20 million smallholder farmers across the world. Through its activities, Syngenta contributed to increase their productivity.

Business Model Overview

- **Mavuno Zaidi™ (MZ)** was launched in 2014 by Syngenta East Africa primarily targeting small and medium farmers in the potato and tomato value chain in Kenya. It had 3 main objectives: affordability (access to finance), access to information, and access to markets
- To achieve these objectives SYT operates a service coalition model where they facilitate access to inputs (SYT and non-SYT), training and information as well as linkages to financial service providers (FSPs) and buyers. SYT is the anchor in the service coalition; taking up the responsibility of partnership building and bears the largest cost in the coalition
- With support provided by IDH from 2020, SYT had the objective to scale the Mavuno Zaidi™ offering to 52,000 farmers across 8 counties in Kenya. Ultimately facilitating the farmers to increase their productivity and livelihoods. SYT has been working with key partners; FSPs like Equity Bank, seed providers like Agrico seed and Freshcrop and buyers like Wedgehut, and Sereni Fries to achieve this objective
- *This analysis covers changes that occurred between 2020 and 2023*

The business model underwent some changes over the period influenced by several drivers;



Context

factors out of company control

Covid-19

Overall, covid led to increased sales for SYT, as more (urban) people ventured into farming. This resulted in a market glut especially for potatoes. Consequently, farmgate prices reduced (particularly in 2021). It also affected operations of a pivotal FSP partner –Tulaa – leading to its closure

Infrastructure

For potato farmers in the Elgeyo Marakwet region access to markets increased significantly after road development. Buyers were able to travel to the farms, which eliminated the need for cold storage

Weather and climate

Climatic shocks such as erratic rains and drought affected provision of finance especially for potatoes as FSPs were reluctant to lend. Yields and total production were also affected e.g., 60% of farmers indicated reducing cultivated acreage during short season due to inconsistent rains



Company

factors within the company control

Internal financial commitment

Despite the turbulence in the economy, SYT continued to make investments in building and maintaining partnerships in the coalition and facilitating access to services for the farmers

Strong partnerships

Closure of Tulaa was unanticipated with 85% of farmer financing expected to be through Tulaa. The partnership with KCB also did not materialise. SYT however, managed to onboard Equity Bank. Other partners e.g., Cropnuts, Agrico, Wedgehut and Sereni Fries were onboarded. These partners provided key services as envisioned resulting in overall increase in farmer yields

Technology

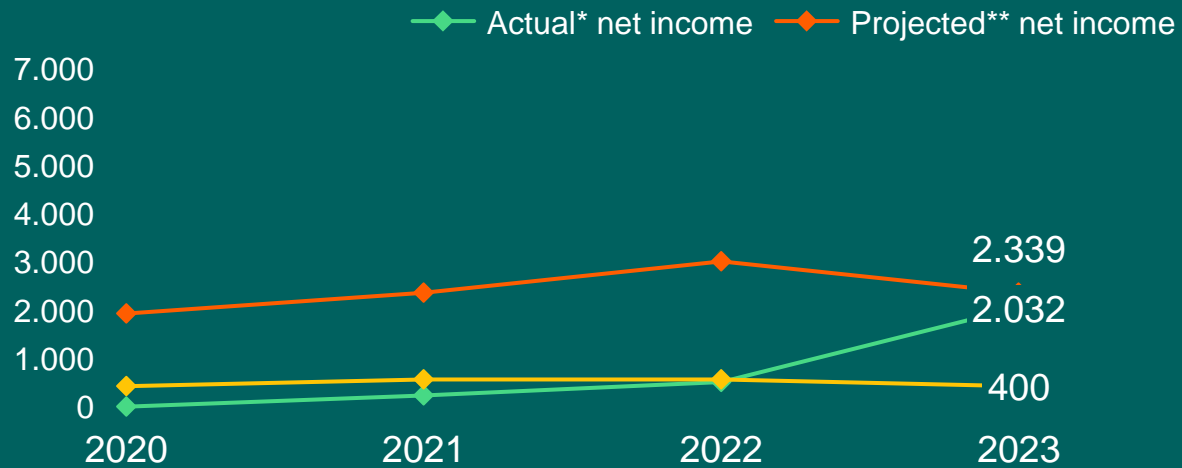
Syngenta is in the process of digitizing its extension and input provision services by means of a customised application called the iVuna. It will connect independent agronomist to farmers through an “uber-like” model and work on a commission basis

these changes impacted the business performance ...

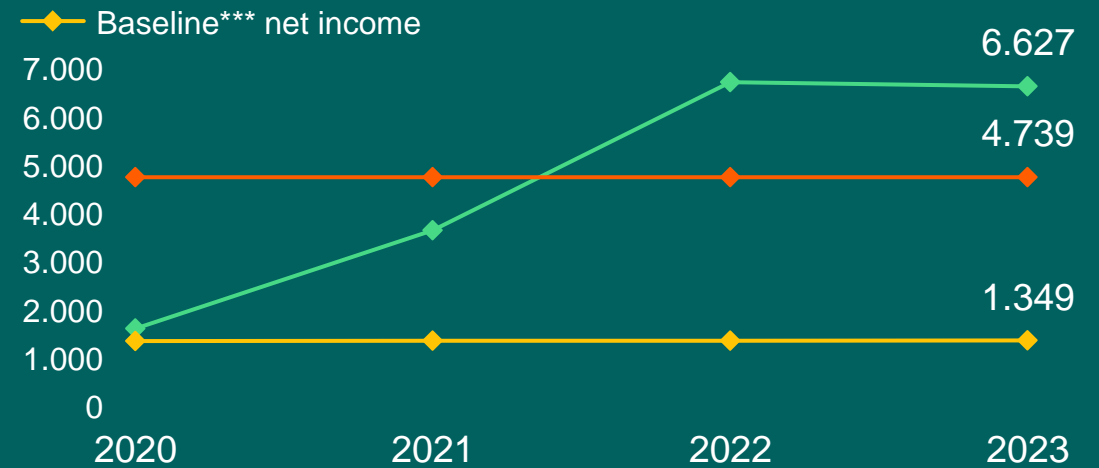
For business sensitivity reasons, we have excluded this section from the public report.

farmers' income was also affected, falling short of projections in the initial years but rising towards project end;

Net income for a 1-acre potato farm (USD)



Net income for a 0.5-acre tomato farm (USD)



- Finance only became accessible to farmers from late 2021 which impacted the land size growth assumptions. Yields were also potentially over-estimated in IBA 1.0
- Access to better quality planting materials resulted in higher yields especially from 2022 (almost double)
- Increase in input prices due to global and local factors led to farmers reducing acreage to manage investment required
- Lower farmgate prices were reported between 2020-2021 due to a potato market glut

- Like with potatoes, finance only became accessible to farmers later in the program, delaying land size and yield growth compared to IBA 1.0 projections
- Although still lower than projected, tomato prices increased steadily over the years as constant weather changes and pests and disease attacks affected production across the country resulting in lower supply and thus higher prices
- Increase in input prices due to global and local factors led to farmers reducing acreage to manage investment required

*Based on actual numbers, **Projected in IBA 1.0, ***Baseline as projected in IBA 1.0

there are key opportunities that can be leveraged and risks to be managed going forward to enhance sustainability (1/2)

#	Opportunities	Recommendations
1	Driving scale and enhancing cost efficient service delivery through digitization	The model is currently not profitable without grants impacting on scale and sustainability. SYT is in the piloting stage of an agronomy app – iVuna that will adopt a commission-based model for agronomists. This is intended to replace the CESP's model ultimately lowering the cost of training and input distribution. Aside from trainings, the app can be optimised to enable FSPs to conduct credit assessment for farmers onboarded and facilitating market linkage with buyers. SYT should consider working with the FSPs and buyers to further customise the app. Behaviour change and digital literacy training for farmers will be key
2	Enhancing the management and governance of the service coalition	SYT was heavily involved in managing the service coalition, coordinating the relationships and managing risks for the coalition partners. This significantly drove up the investment by SYT particularly in facilitating access to finance and markets. The overdependence on SYT has a huge implication on the sustainability of the coalition. While this analysis did not cover costs and value derived by each of the partners*, it is an important area to explore going forward to build better mechanisms for value, cost and risk sharing for the survival of the coalition
3	Building the capabilities of the FSPs to serve the smallholder farmer segment	The facilitation of access to finance was very critical for the project's success, yet only MoU with one FSP was fully operational presenting a major risk. FSPs generally perceive the smallholder segment as high risk and hence require more support in building their capabilities to serve this segment. Development organisations can play a role in facilitating access to finance through de-risking mechanisms as well as digitization of FSP operations to reduce onboarding and due diligence costs

*Due to limited reporting of the data done by the partners

there are key opportunities that can be leveraged and risks to be managed going forward to enhance sustainability (2/2)

#	Opportunities	Recommendations
4	Enhancing the business case for the commission-based agronomist model	The business case for the proposed commission-based model is not clear as potential income is much lower than alternatives which might affect engagement. The incentive structure needs to be enhanced to make the model competitive e.g., by linking agronomists to buyers and other input providers hence more commissions. Agronomists and agrovet relationship also need to be explored e.g., do the agronomist pick products from the agrovets? How does that affect the commissions earned?. Key risks like agronomists' integrity, and safeguard for input sales also need to be mitigated. See more considerations here .
5	Integration of low-cost climate smart interventions and promotion of value addition	<p>While SYT tried to connect tomato farmers with formal markets to unlock better prices, it was impossible given the high influence of brokers/cartels in the market. Phased production planning has been adopted by farmers especially those with access to irrigation. This helps in managing the seasonality of the crop where farmers can still supply off-season at better prices. On the other hand, while it was possible for SYT to facilitate formal market contracts for the potato farmers, the capacity of the buyers is insufficient. On both cases, there are opportunities to explore the feasibility of value addition at farm level to increase value for the farmers e.g., by supporting set up of cooperative led processing facilities</p> <p>At the production level, the farmers faced frequent pests and disease attacks and droughts that resulted in significant increase in their cost of production as well as major losses. Continuous education to the farmers on climate change adaptation and mitigation practices is thus imperative. Further explore the design of the crop insurance product and how to better suit it to the farmers and educate the farmers on the benefits and claims process. Promotion and education on home-made organic inputs such as Bokashi fertiliser and use of high yielding drought resistant planting materials will also help lower the cost of production and improve productivity</p>

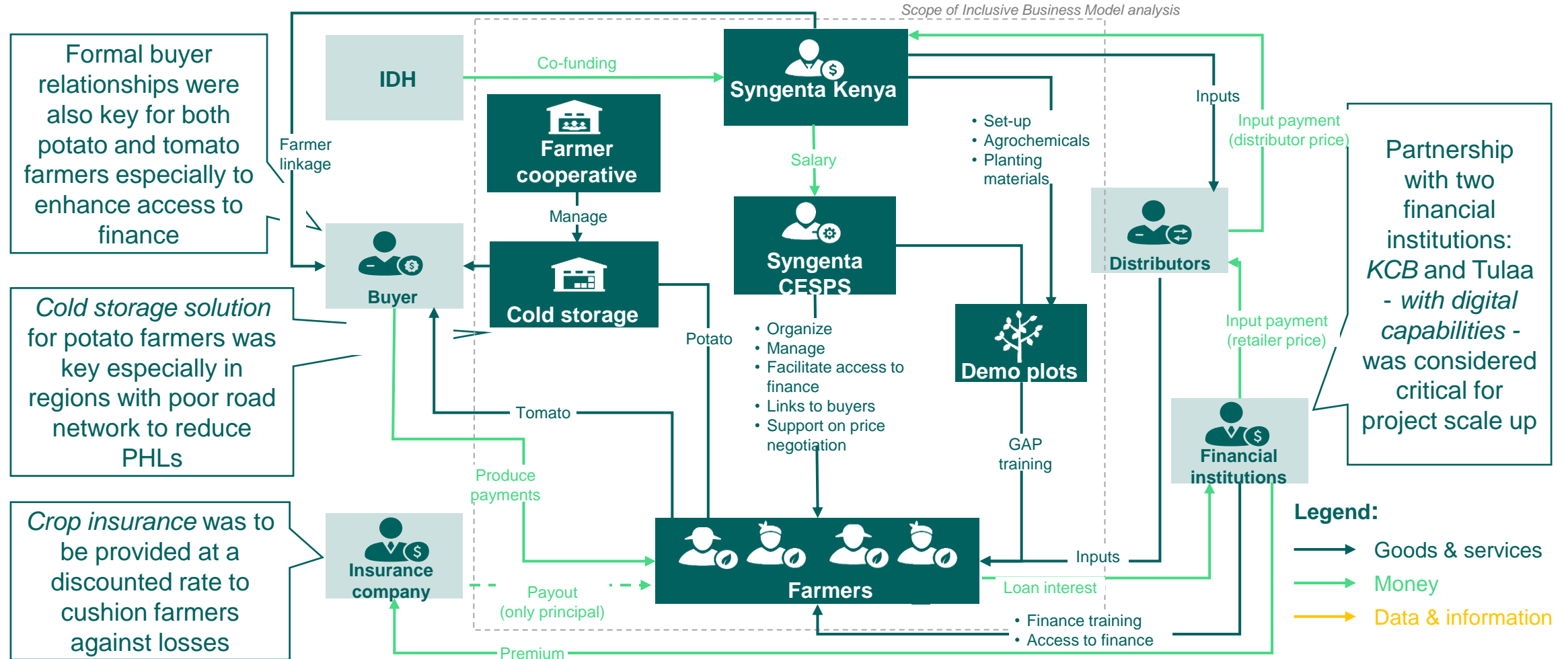


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The Business Model



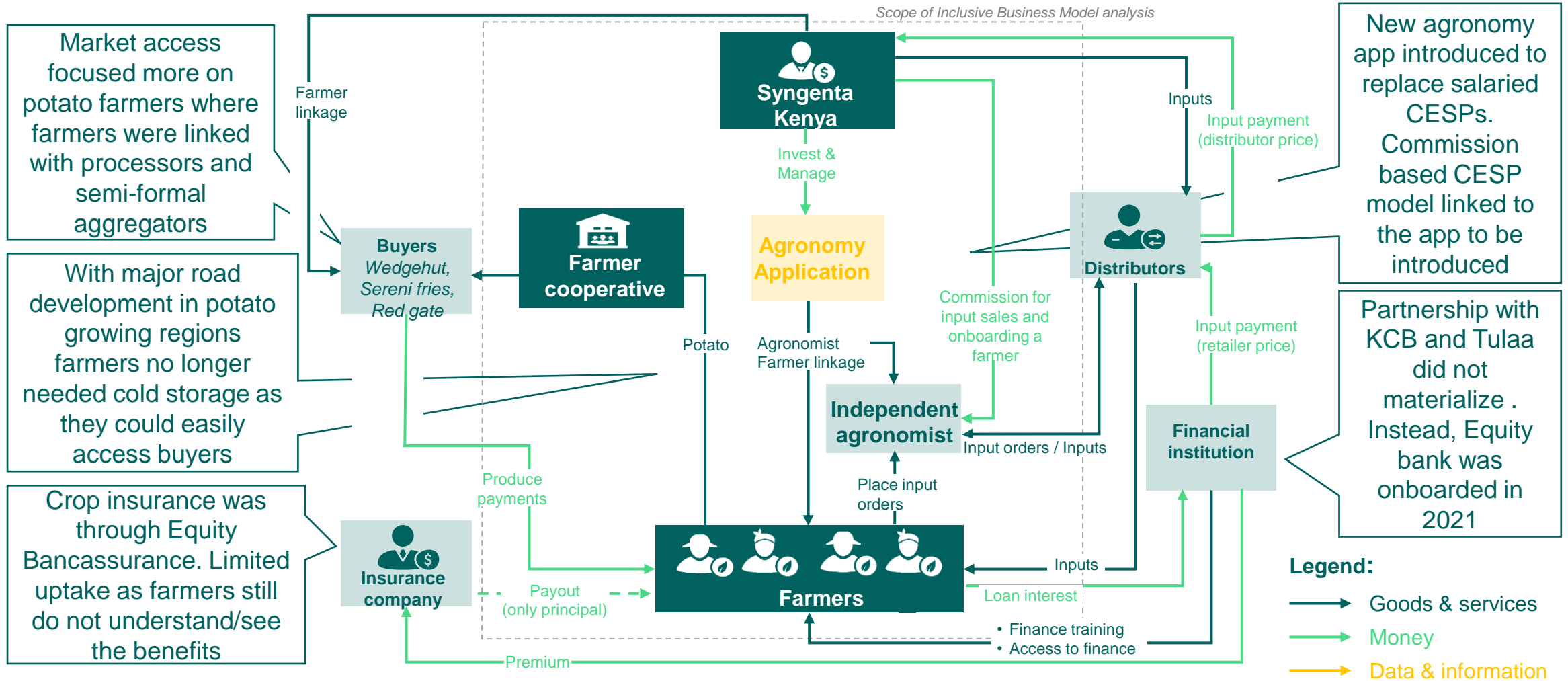
Business Model overview | *In 2019*, the model envisioned a pivotal role for CESP*s* in facilitating access to information, inputs, finance and markets



Source: 1) [SDM 1.0 \(2019\)](#); 2) *Company interviews (2023)**
 * CESP*s* - *Community Extension Service Providers who are salaried staff of Syngenta*



Business Model overview | *By 2023*, new financial and market partners had been onboarded; cold storage was phased out; and a new digital extension model was being deployed



Source: Company interviews (2023)



SWOT | Syngenta's pivotal role in the service coalition is a valuable foundation on which to build a more sustainable and inclusive value chain (1/2)

	Helpful	Harmful
	Strengths	Weaknesses
Internal	<ul style="list-style-type: none"> Highly competent management team and experienced extension officers The company has a dominant presence in international markets. Its brand recognition is an important lever in helping smallholders access finance and markets Syngenta's products are in general viewed as the highest quality products in the market Over time, Syngenta has been able to build robust partnerships with financial service providers, input providers, and offtakers to serve the smallholder farmer segment A decade of experience working with smallholder potato and tomato farmers 	<ul style="list-style-type: none"> Its products are exposed to forex risks impacting the company's revenues and profitability The company receives more and more scrutiny worldwide, regarding the harmful negative externalities of some of its products The smallholder segment is one of the riskier segments due to its vulnerability to climatic shocks and limited access to finance The Mavuno Zaidi program has always been dependent on external funding from support organizations SYT takes up a huge cost of the service coalition coordination, posing a risk of continuation once donor funding stops Large dependency on one financial service providers, Equity Bank The business case for CESP, in moving from the current extension model to the digitized extension model is yet to be proven Significant challenges accessing quality affordable potato seed as demand exceeds supply which affects potato farmers' productivity

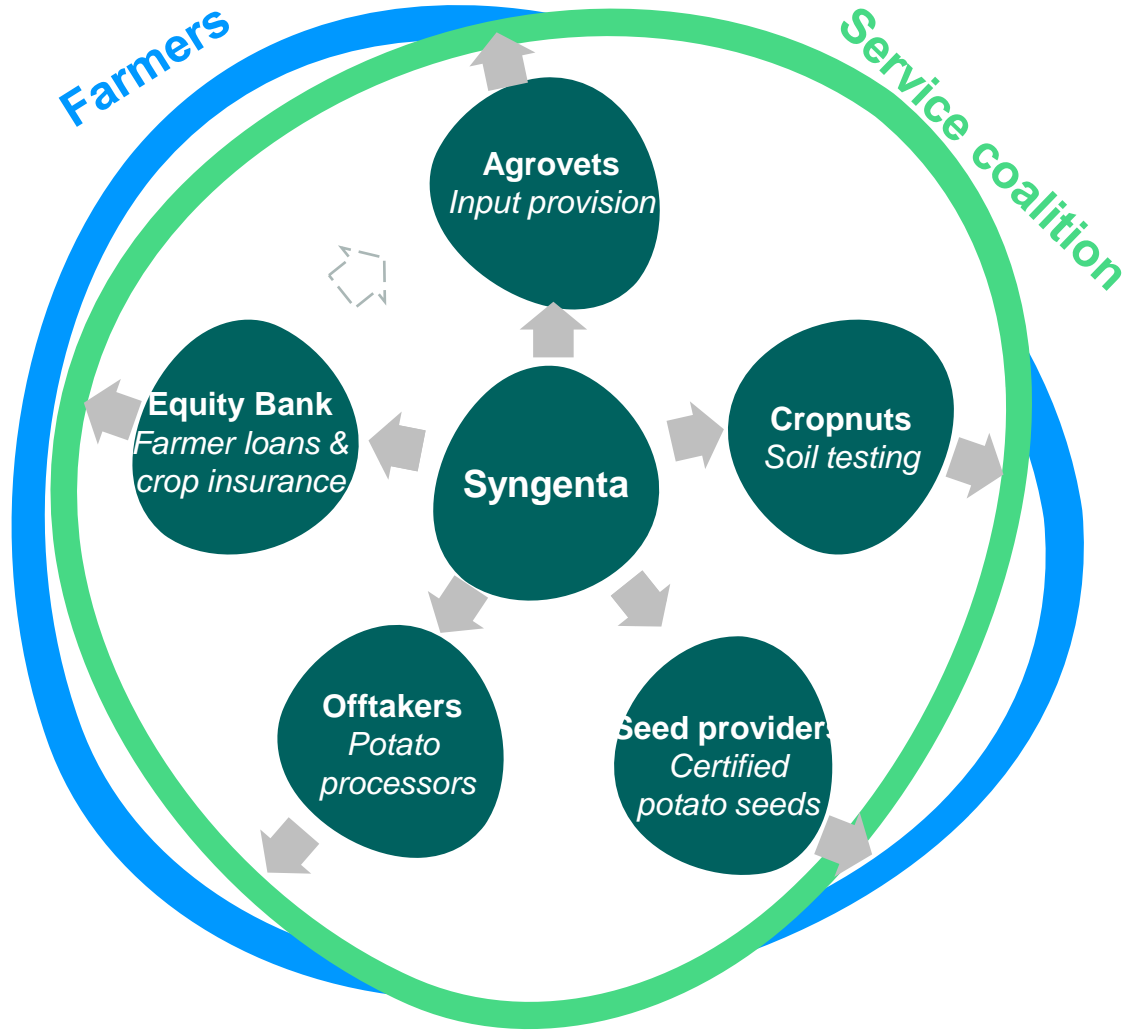


SWOT | Syngenta’s pivotal role in the service coalition is a valuable foundation on which to build a more sustainable and inclusive value chain (2/2)

	Helpful	Harmful
	Opportunities	Threats
External	<ul style="list-style-type: none"> Improved infrastructure helps farmers access markets more easily, decrease their PHL and increase their net income. This in turn leads to investment into the farm (by size or irrigation etc.), which increases demand for SYT inputs Once the service coalition and partnerships are established, SYT can continue to onboard other farmers, with other crops to also guarantee a more diversified segment Digitization through the newly developed application can enable SYT to reach more farmers more efficiently Diversification at SYT level into organic inputs and biologicals. This move not only aligns with evolving market trends, but also presents sustainable and eco-friendly solutions to both Syngenta and the farmers 	<ul style="list-style-type: none"> Land fragmentation in smallholder farms creates challenges in attaining economies of scale SYT operates in an environment that is likely to become more and more regulated regarding chemical input use and changes in government policies impact its operations and profitability Increase in adverse weather events such as erratic rainfall, temperature variations leads to distorted planting planning and yield loss and negatively impacts farmer incomes Once extension is only available on demand and digitally, smallholder farmers might opt for alternative, non-chemical methods or traditional farming practices Additionally, the commission-based extension application might incentivize overselling and mis selling by independent agronomist Ethical and social considerations related to the use of certain chemical inputs. Community perceptions and concerns about health, safety, and environmental impact may affect the acceptance of these products



Service coalition | SYT is the anchor in the service coalition; taking up the responsibility of partnership building and organization and bears the largest cost in the coalition



Key roles undertaken by SYT and benefits derived

- Coalition management including onboarding new off-takers, and service providers, clarifying and assigning roles and responsibilities, facilitating data sharing, and managing relationships over time
- Customer acquisition and initial due diligence assessment for FSPs reducing transaction costs
- Customer acquisition for the off-takers and training of farmers reducing sourcing costs
- Pre-negotiation of floor prices with off takers on behalf of the farmers
- Supply of quality inputs to the farmers and training on GAP increasing yields

Challenges

- There is no clear distribution of costs of running the service coalition with most costs still borne by SYT
- SYT is still heavily involved in the partnerships and plays an intermediary role between the farmers and the service providers/buyers

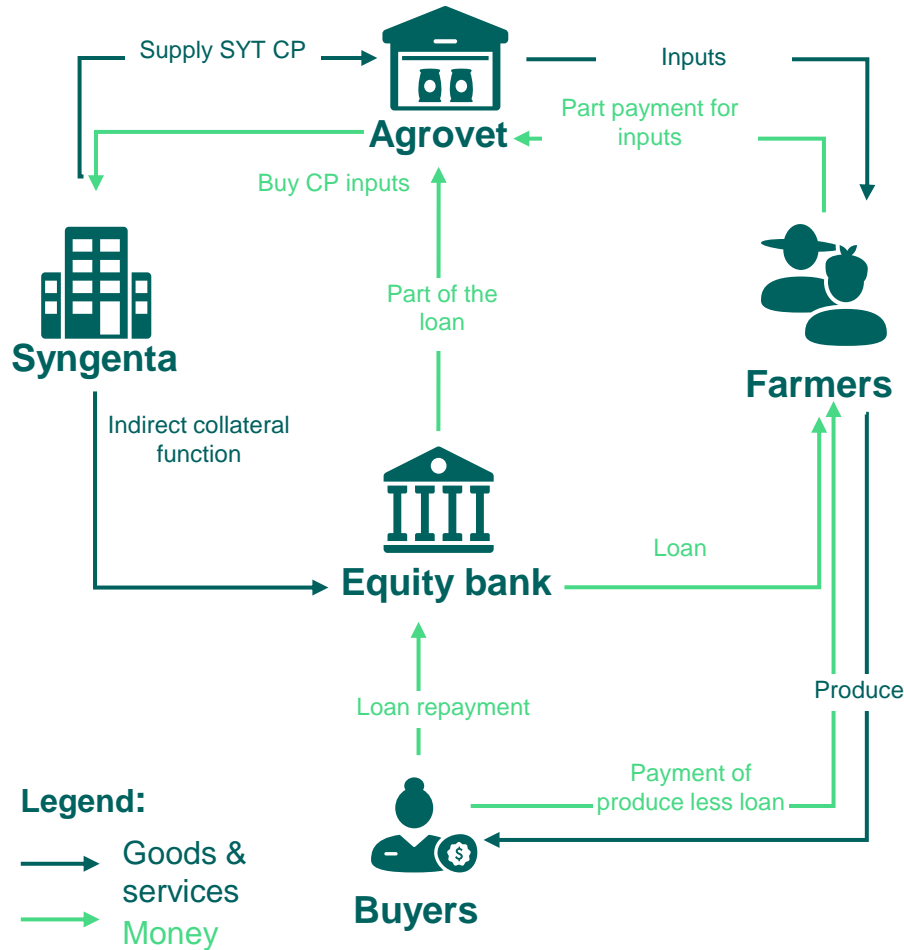


Services | The model is operated as a service coalition with SYT facilitating access to quality inputs (SYT and non-SYT) and training as well as linkages to FSPs and buyers

Category	Service Description (IBA 1.0)	Status (IBA 2.0)
Training & information	<ul style="list-style-type: none"> Farmers received training on GAP and on effective use of agrochemical products. CESP's provide training to groups through demo plots Training on business and financial skills provided by FSPs (KCB/Tulaa) 	GAP training provided. Record keeping training by the CESP's, and financial training provided by Equity Bank
Inputs	<ul style="list-style-type: none"> SYT works with major distributors who either supply inputs directly to farmers or sell them to local stockists SYT provides farmers with high quality crop protection and fertilizer products for tomato and potato SYT seeds are provided for tomatoes only. By 2021, SYT introduce certified potato seeds (non SYT products) in the bundle through partnering with seed multipliers In the Tulaa model, farmers could decide what type of agrochemicals to purchase. In the KCB model, the input bundle was fixed 	<p>Farmers able to access inputs and input credit under the partnership with Equity bank</p> <p>Suppliers of potato seed such as Agrico and Freshcrop onboarded</p> <p>Soil testing company – Cropnuts is onboarded to provide soil testing services at reduced costs</p>
Financial services	<ul style="list-style-type: none"> SYT facilitates the provision of inputs and crop insurance on credit to the farmers through partnerships with FSPs (KCB and Tulaa) Insurance to be facilitated by Syngenta and cover offered by APA 	No partnership with KCB/Tulaa, nor insurance by APA. Partnership with Equity Bank for input credit and crop insurance
Market access	<ul style="list-style-type: none"> SYT facilitates access to market by supporting aggregation, storage, and by linking farmers with local buyers. Farmers agree on a common selling price. SYT supports farmers in setting the price and negotiates with the buyer 	<p>Market linkage support provided for potato farmers to processors and aggregator</p> <p>Challenges with market linkages for tomatoes</p>
Equipment & Labour	<ul style="list-style-type: none"> SYT supports local farmer associations in setting up cold storages for potatoes in inaccessible regions such as Narok and Elgeyo Marakwet 	Road development improved market access in these regions and thus intervention was not implemented



Access to credit | Syngenta operates a tripartite financing agreement with Equity Bank, and buyers with market contracts serving as collateral for the bank

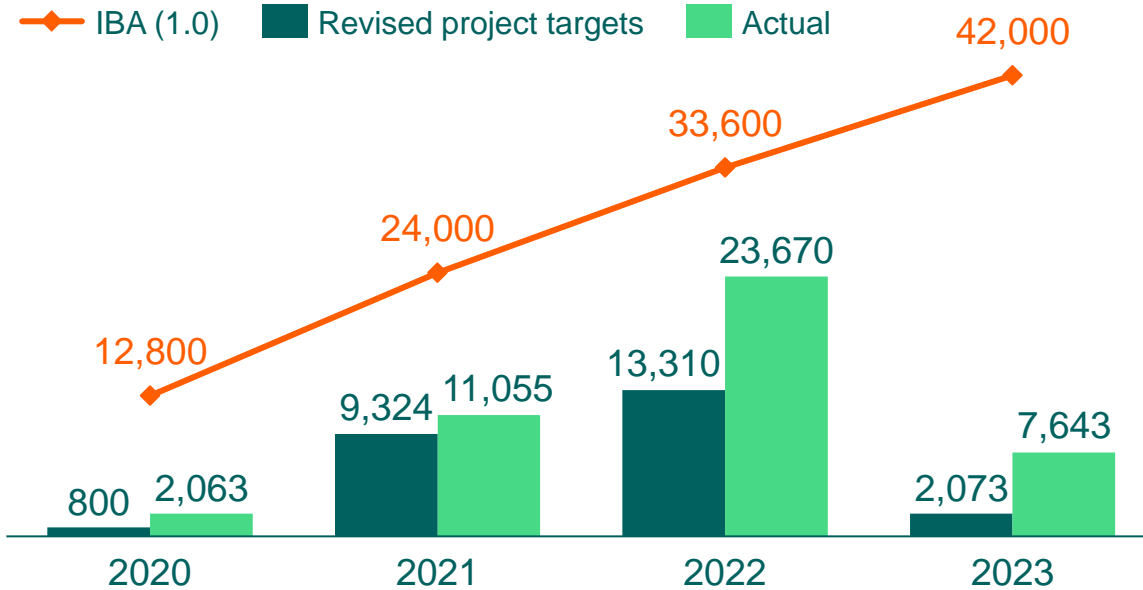


- SYT endorses Equity bank, but farmers are free to choose their loan provider. SYT has also established MoUs with 3 other FSPs which farmers can also approach for a loan.
- SYT has invested in a tripartite financing agreement, where SYTs program with the farmers serves as collaterals for the banks.
- Farmers have faced challenges accessing loans due to issues with their credit status i.e., when listed with a Credit Reference Bureau (CRB). Current approval rate is however high at 80% as CESP's often do pre-screening to ensure farmers meet all the requirements of the banks.
- **Key success factors:** dedicated officers at Equity Bank who serve SYTs farmer base, nearby bank branch offices, faster turnaround time of 2-3 days, the bank acknowledging the value of the smallholder farmer segment, and bank's top management ownership and engagement

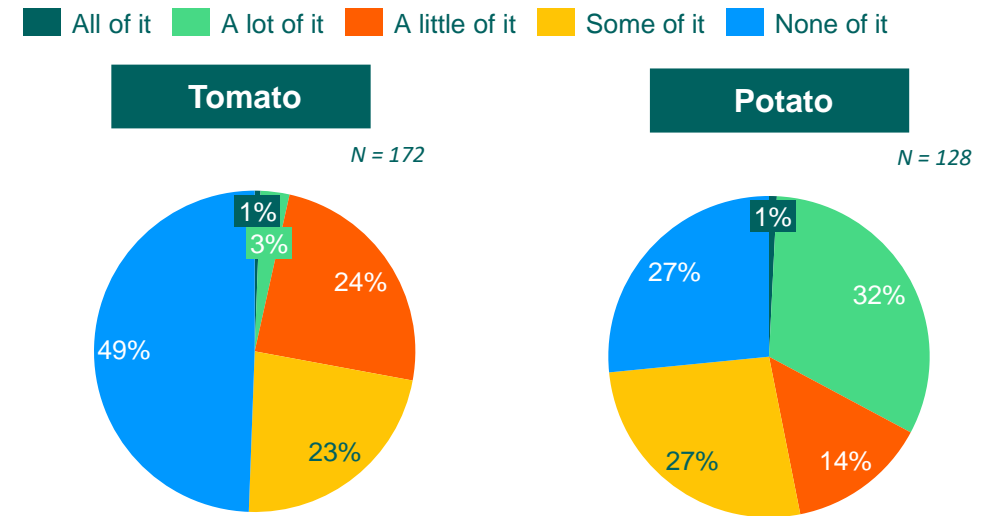


Access to market | Syngenta has played a crucial role in helping potato farmers access structured markets. The dynamics of the tomato market, make it harder to intervene

No. of farmers accessing markets (potato and tomato)



Change in crop sales linked to SYT (farmer survey)



Potato: SYT established partnerships with 11 big aggregators and processors over the project period. With the processors, farmers access higher prices (almost double market prices) but they have limited capacity to offtake. Contracts with the processors also function as collaterals for the banks enhancing access to finance. Most potatoes were sold through aggregators who also provide a slightly higher price compared to the market. Farmers are concerned that increased productivity will result in a glut and thus lower prices. SYT trained farmers on seasonality and production schedules to help manage the harvest and spread out the risk of price fluctuations.

Tomato: The tomato market is less formalized and structured with many middlemen and high price fluctuations. Farmers thus prefer to get their own markets without being locked down in price. SYT has thus not been able to connect, and contract structured off takers.



Segmentation | Initial segmentation proposed farmer segments based on two FSP partners. The partnerships, however, did not materialize and thus the segments were not adopted

2019	KCB Potato farmers	KCB Tomato farmers	Tulaa potato
Description	More advanced farmers with a fixed input package and loan, and crop insurance		Newer farmers with a flexible input package and no crop insurance
Inputs	Insecticide (1), fungicide (2), fertilizers	Insecticide (4), fungicides (3), fertilizers, seeds	Insecticide (1), fungicides (2), fertilizers

Initially, segmentation was based on FSPs serving two different types of farmers: more advanced farmers (that were part of the project already) and newer farmers. KCB would serve the more advanced farmers with higher loan requirements and Tulaa would, with its platform approach, serve the newer (potato) farmers. Both partnerships, however, did not materialize as Tulaa was wound up in 2020 and KCB was not able to adequately serve the smallholder segment

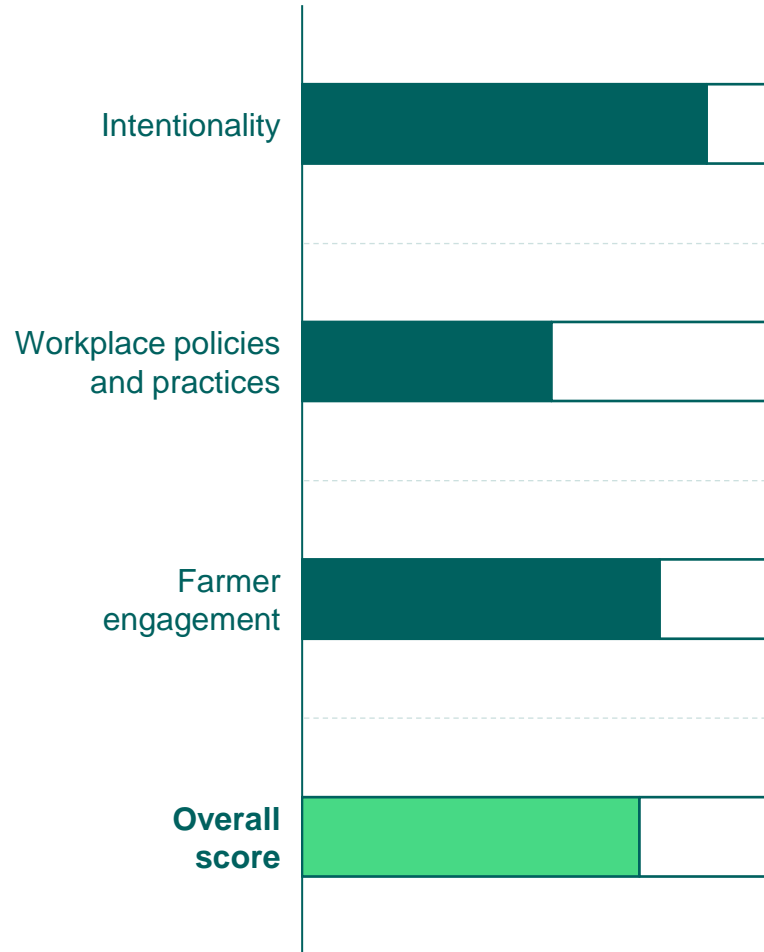
2023	Baseline potato	MZ potato farmer	Baseline tomato	MZ tomato farmer
Description	Not part of project, no access to finance and formal markets	Access to finance, inputs and offtakers	Not part of the project no access to finance	Access to finance, inputs
Inputs	No Syngenta inputs	Full Syngenta bundle	No Syngenta inputs	Full Syngenta bundle

Given the critical role of finance in the model, Syngenta onboarded Equity Bank in 2021 to serve more advanced farmers as well as new farmers. Given that the initially proposed segmentation was not adopted, for this analysis the distinction is made between baseline potato and tomato farmers (farmers that are not in the [Mavuno Zaidi program](#)) and MZ potato and MZ tomato farmers (farmers that are part of the Mavuno Zaidi program respectively)



Gender assessment | The project was assessed to be gender intentional with opportunities to leverage gender disaggregated farm level assessment to better inform service provision

Observations



- There are no services specifically designed and targeted for women. While there have been attempts to design loan products specifically for women, banks have not been enthusiastic. SYT however, remains committed to enhancing financial access for women. Farmer groups are usually leveraged to facilitate access to finance for women. SYT has the target of reaching 40% female farmers which it met, and tracks gender-related KPIs.
- 46% of the total project’s team is female while 67% of the project management team is female. SYT Kenya has been very intentional in guaranteeing equal pay for equal work policies and living up to anti-sexual harassment policies.
- Only 1 out of 8 of the board of directors of SYT Global is female while the entire (8 people) Global Leadership Team is male.
- Initial consultation was undertaken to determine the input needs for male and female farmers. No differences were observed across the farmers and thus the input package is not tailored based on gender. The major difference observed and considered by SYT is on preferred training times. Phone numbers are used as unique identifiers.
- The field team collects upto 40 data points disaggregated by gender – these are however, not often analysed. Of the 13 CESPS, 5 are women.
- Overall, The Mavuno Zaidi program is assessed as gender intentional. To become gender transformational, the service coalition manager could be leveraged to explore partnerships with financial service providers that do see the business case in specifically targeting women. Next to that, SYT could do gender disaggregated data analysis to make sure both are able to perform equally if they aren’t yet.

Source: Company interviews (2023)



3

Business Case

*For business sensitivity reasons, we
have excluded this section from the
public report*



4

Impact Case



Farmer segments | Actual MZ farmer performance (2023) is compared to KCB* and baseline farmer projections (2019)

Characteristics	Potato baseline	MZ potato farmers	Tomato baseline	MZ tomato farmers
Starting yield	3,700 kg/acre/season	4,200 kg/acre/season	7,500 kg/acre/season	16,000 kg/acre/season
Current yield	3,700 kg/acre/season	7,200 kg/acre/season	7,500 kg/acre/season	21,600 kg/acre/season
Seasons	2	2	2	2
Farm size	1.3 acre	5 acre	0.6 acre	1.5 acre
Farm-gate price	0.17 USD/kg	0.31 USD/kg	0.33 USD/kg	0.36 USD/kg
Region	Nakuru		Kirinyaga, Embu	
Services				
Training		GAP & financial literacy		GAP & financial literacy
Inputs		Crop protection, seeds, fertiliser		Crop protection, seeds, fertiliser
Market access		Connected to processors/aggregators		
Financial services		Input loans		Input loans

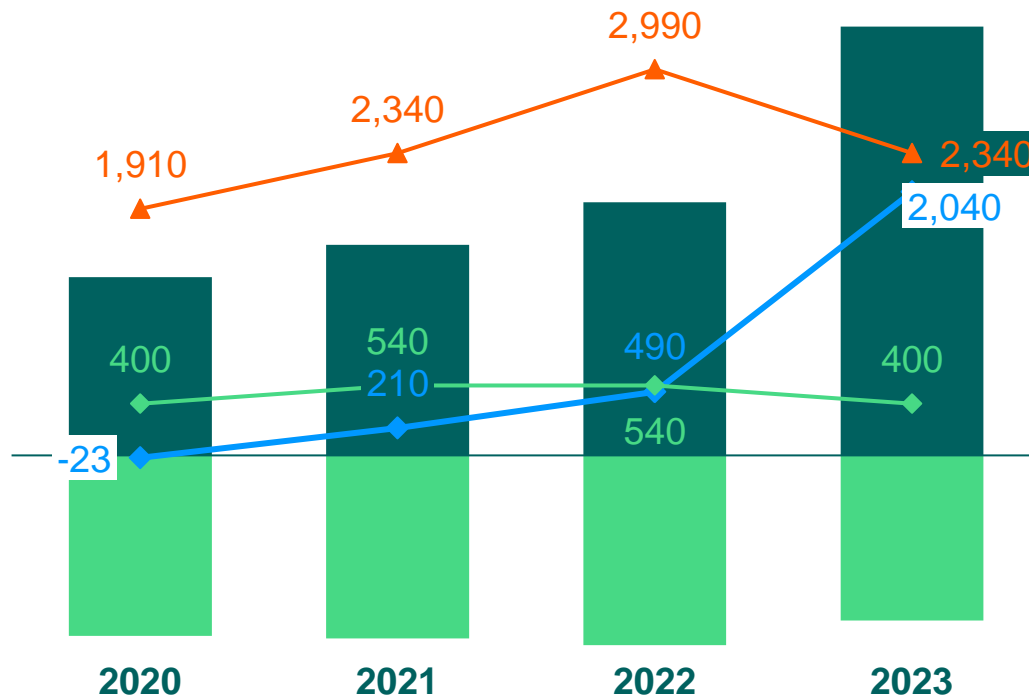
*IBA 1.0 segments were based on partnership with 2 FSPs (KCB and Tulaa) that did not materialize. The IBA 2.0 compares the KCB farmer to the current farmer receiving loans from Equity Bank since the terms between the two banks are not significantly different



Farm P&L (1 acre) | *Potato* farmers actual net income experienced a steep growth from 2022 due to use of higher yielding seed varieties and better farming practices resulting in higher yields

Profit and loss for a 1-acre potato farm (USD)

■ Revenue (seed +ware) ◆ Actual net income (CFX)* ▲ IBA 1.0 net income
■ Cost of production ◆ Baseline 1.0 net income



Total farm net income	-70	780	2,125	10,160
Actual land size	3.1	3.8	4.4	5

- Recurring climatic shocks specifically delayed rains throughout the project period affected timing of loan application and disbursement with FSPs also unwilling to process more credit facility when drought conditions were foreseen. This impacted access to quality inputs
- Increase in price of inputs due to both global and local factors led to farmers reducing acreage as cost of production increased
- Finance through project partners only became accessible to farmers from late 2021 which impacted the land size growth assumptions. Yields were also potentially over-estimated in IBA 1.0
- Access to higher yielding planting materials through partnership with seed suppliers resulted in higher yields especially from 2022

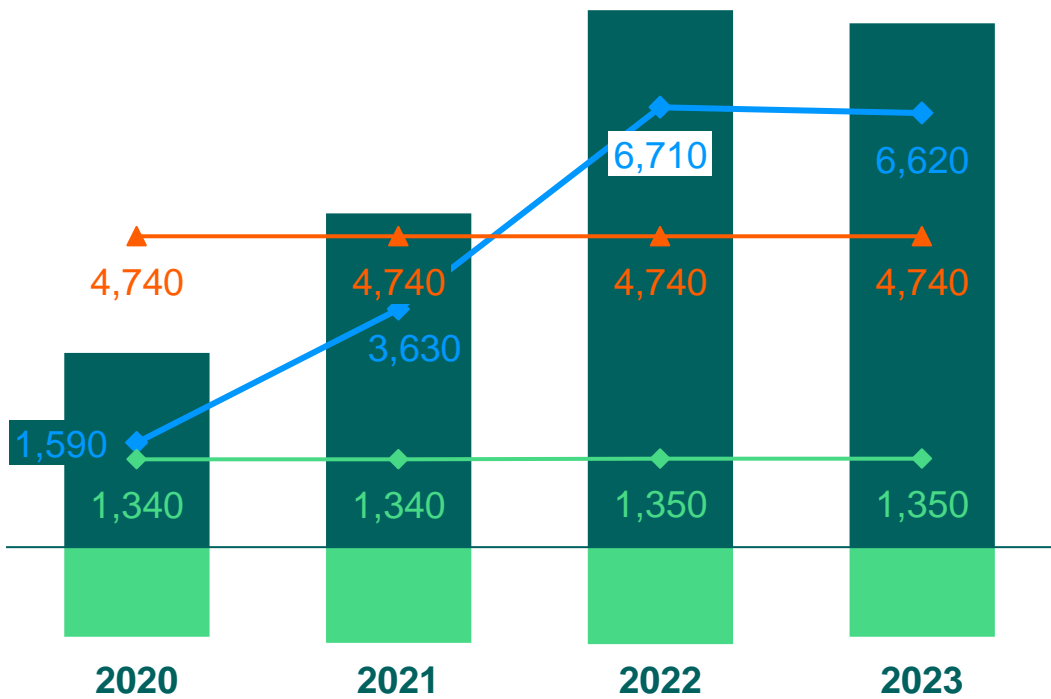
• Note: The dip in projected net income in 2023 is due to a stagnating land size combined with biannual dips due to the seed cycle of having to re-use seed in some years and buy new ones after ~3 seasons. *CFX (Changing Forex Exchange) considered the annual KES-USD exchange rate changes in Kenya [outlined in Annex](#)



Farm P&L (0.5 acres) | Even though, *tomato* farmers were projected to have a steady state income throughout 2020-2023, farmers have only been able to meet this target in 2022

Profit and loss for a 0.5-acre farm during the project (USD)

■ Tomato revenue ◆ Actual net income (CFX)* ▲ IBA 1.0 net income
■ Cost of production ◆ Baseline 1.0 net income



- Tomato farm gate prices almost doubled, contributing significantly to net income eventually outperforming projections
- Increasing prices of inputs resulted in higher cost of production
- Like with potatoes, finance only became accessible to farmers later in the program, delaying land size growth, and yield per acre due to access to inputs
- The new variety of seeds, GAP and continuous access to irrigation contribute to the 2020 jump in yield compared to project targets although still lower than the IBA 1.0 projections

Total farm net income	5,250	9,100	18,450	19,900
Actual land size	1.13	1.25	1.38	1.5

Sources: Company interviews 2019, 2023. Find the complete P&L in the [Annex](#).
 *CFX (Changing Forex Exchange) considered the annual KES-USD exchange rate changes in Kenya as [outlined in Annex](#).

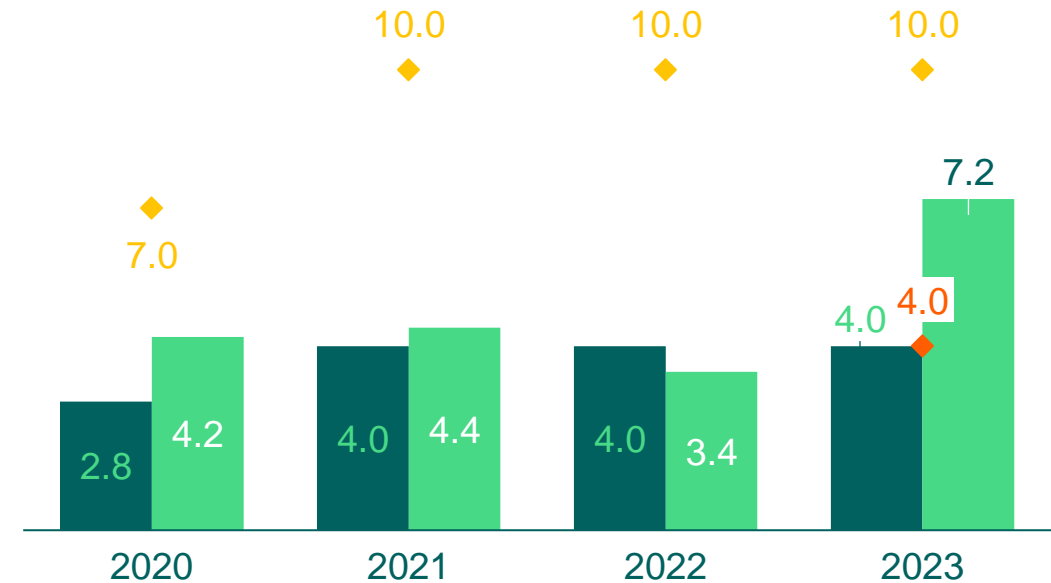
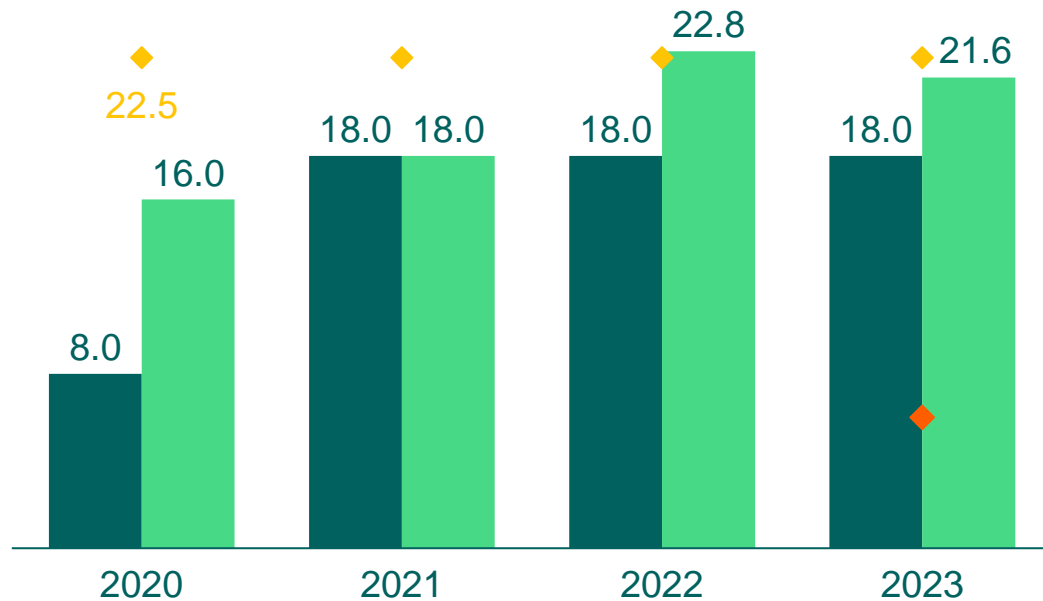


Income drivers - yield | On average the project targets on yield are surpassed for both crops. The actual yield is, however, lower than the IBA 1.0 projections particularly for potatoes

Tomato farmers' yield (MT/acre/season)

Potato farmers yield (MT/acre/season)

◆ Farmer survey 2.0 ◆ IBA 1.0 ■ Project targets ■ Actual

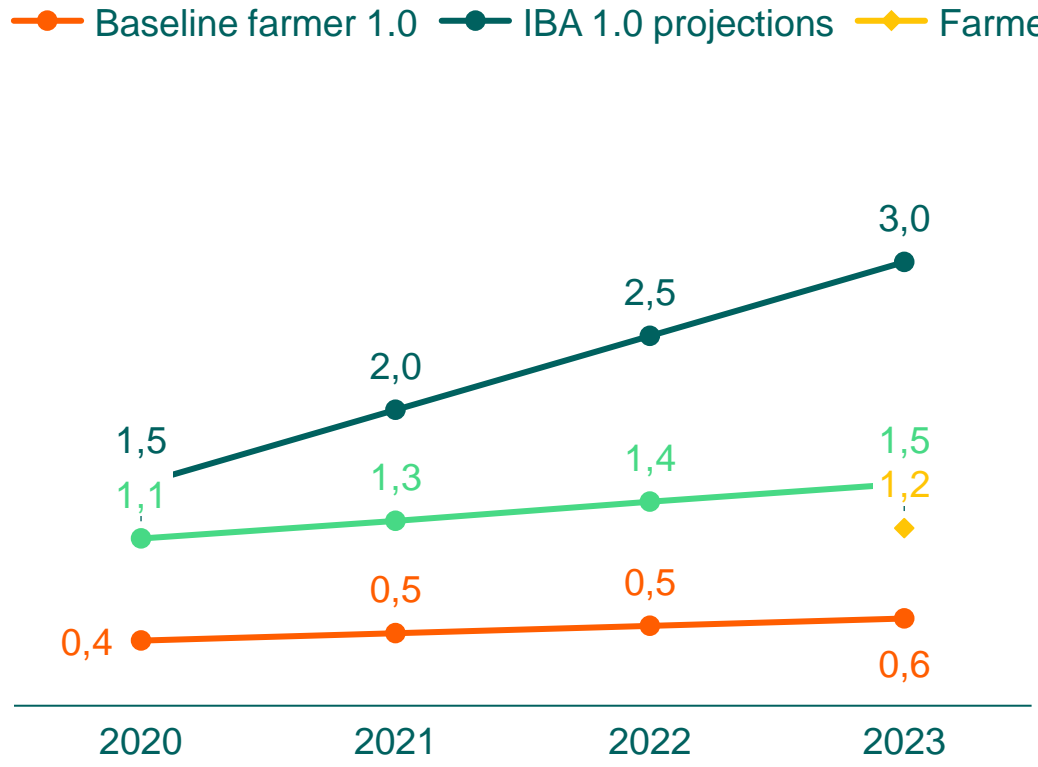


Note: The actual data was self reported by SYT through the KPI reports. There is quite a variation between actual data reported compared to data from projected performance in the IBA 1.0 especially for potatoes which might have been overestimated. IBA and baseline (1.0) farmer data were assumptions given by the SYT agronomist. Baseline farmer were assumed to produce 7.5MT and 3.7MT per acre per season for tomato and potato, respectively. The farmer survey (2.0) collected showed very low yield for tomatoes 6MT/acre/season while for potato it was almost in line with the project targets (4MT/acre/season). Farmer survey question was asked as: "how much of the "crop" did you produce during this period?" The IBA 2.0 used the actual yield reported by SYT

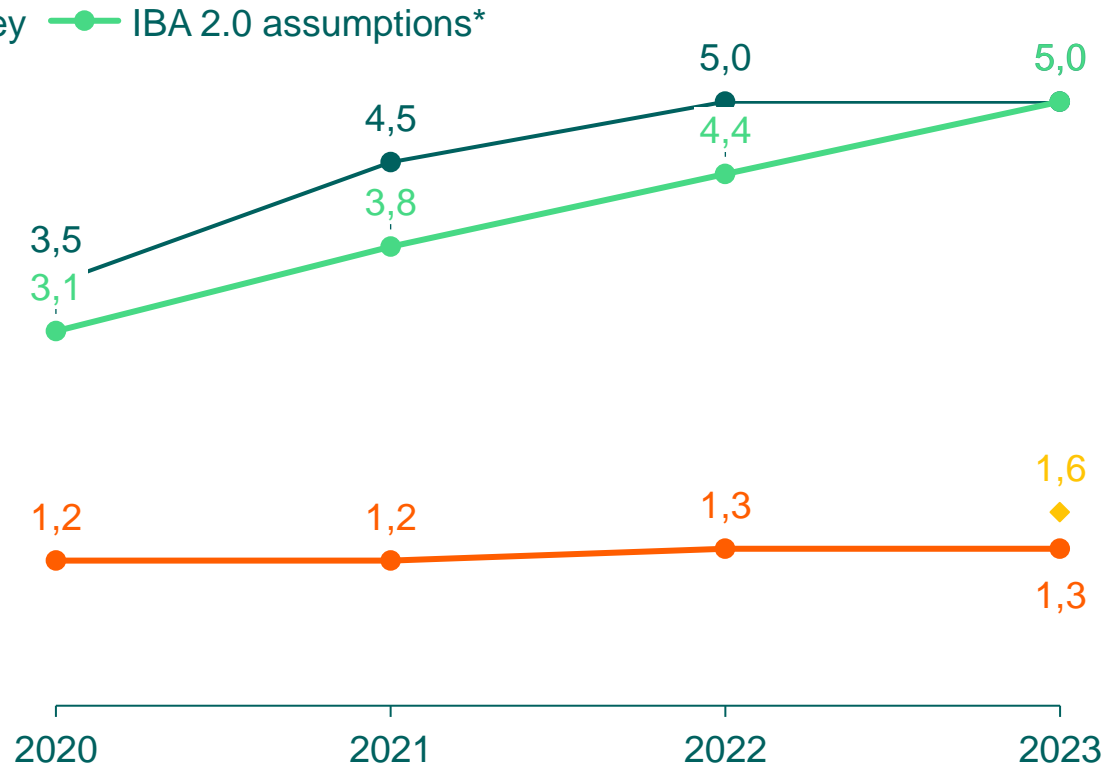


Income drivers – land size | While farmer survey indicated average land sizes to be lower than projected, anecdotal evidence from SYT suggests growth in line with IBA 1.0 projections

Tomato farmers' land size in acres



Potato farmers' land size in acres



Note: The land size for IBA 1.0 and baseline 1.0 farmers were based on self reported data from the SYT agronomist. While the farmer survey shows minimal growth in land size compared to the projections, the SYT team experiences on the ground is that the farmers who were able to access finance, met the target land size which was to some extent supported by our Focus Group Discussions. The discrepancy could be due to how the question is phrased in the survey i.e., what is the total size of your farm, what size of the farm is dedicated to potatoes. This might mean farmers answer just for the own land and not include leased land (which is common). The anecdotal evidence could also be biased and possibly applicable to only a few farmers. IBA 2.0 leverages the numbers from the SYT team, although actuals were not recorded year on year. This is a key driver that should be monitored going forward.



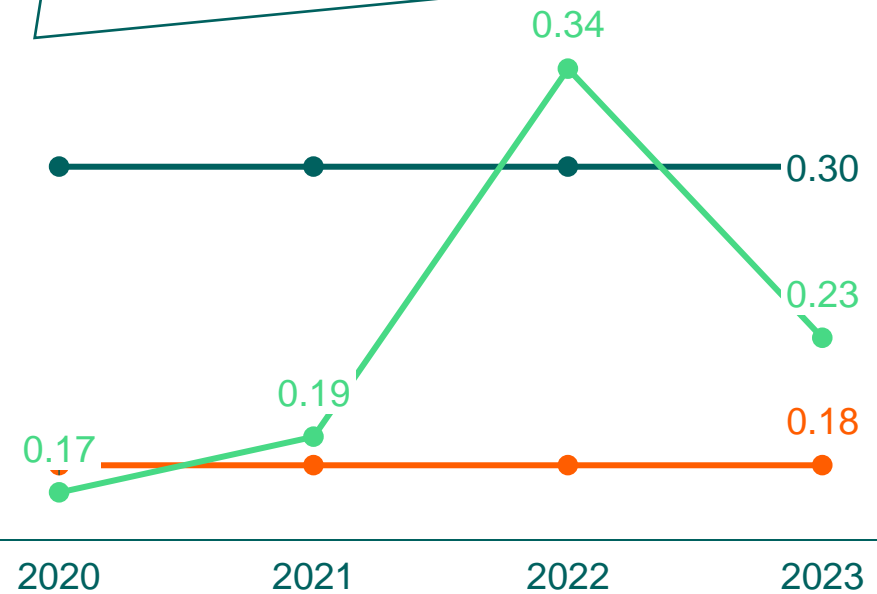
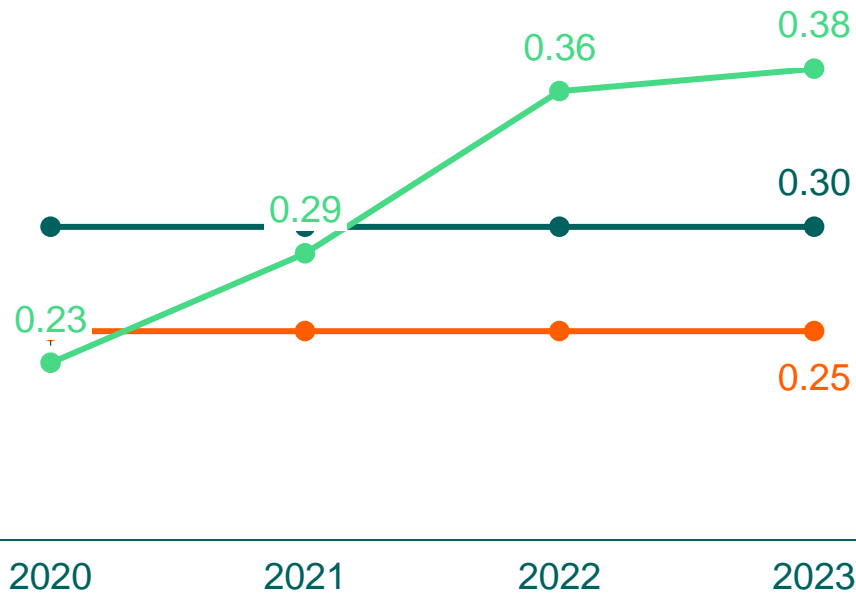
Income drivers – prices | Actual prices deviate substantially from the IBA 1.0 projections given the changing dynamics of the market, changing weather patterns and pest and disease attacks

Tomato farmer prices (USD/kg)

Potato farmer prices (USD/Kg)

—●— Baseline farmer 1.0 —●— IBA 1.0 projections —●— Actual*

Average potato prices reported were lower between 2020 – 2021 compared to the IBA 1.0 projections due to a potato glut arising from the Covid 19 pandemic as more people turned to farming of potatoes. Prices rose between 2021 and 2022 as food joints (a big potato market) resumed business. Tomato prices on the other hand increased over the years as constant weather changes and pests and disease attacks have affected production across the country resulting in lower supply and thus higher prices

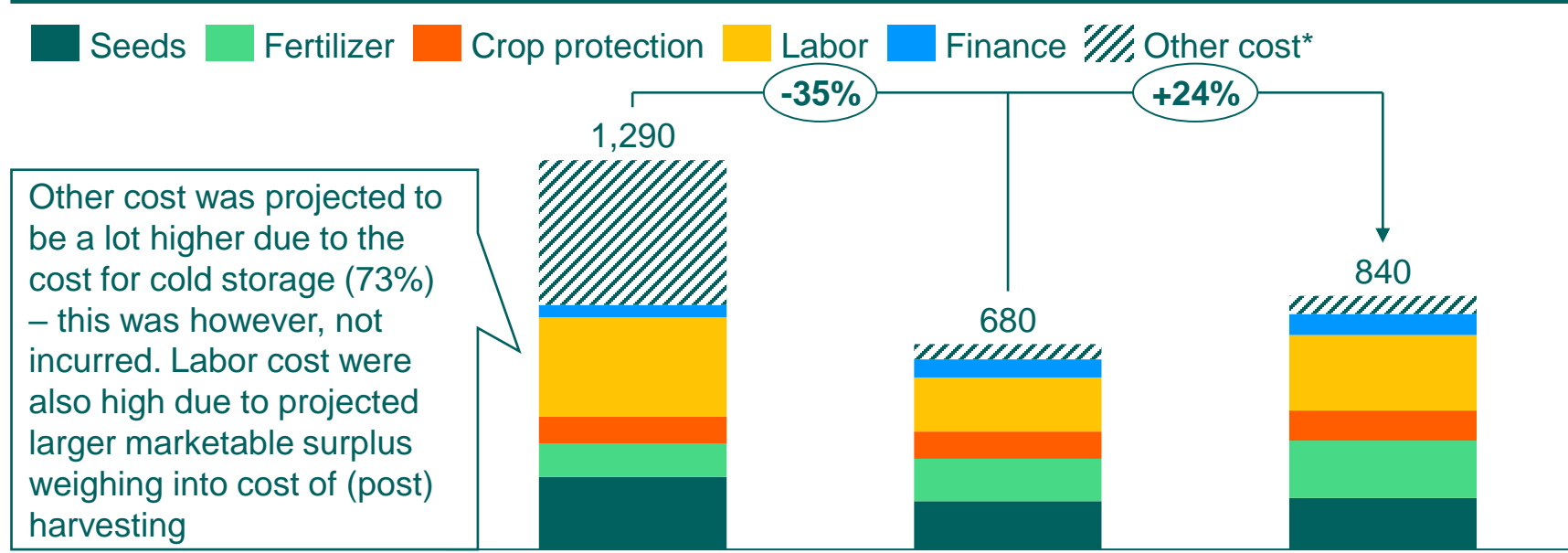


Note: IBA 1.0 and baseline farmer projections were assumptions from SYT agronomist. Prices in IBA 1.0's are usually kept constant as they are difficult to predict
*Actual prices do consider a changing currency exchange rate, whereas within the IBA 1.0 projections these were not considered.



Income drivers - cost of production | Increasing prices of inputs resulted in 23% increase in cost of producing *potatoes* over the project period

Cost of production (USD/acre/season)* for potatoes



Prices of all the inputs increased over the period (application rates and number of applications remained the same). The biggest increase was on fertilizer (27%), labor (26%) and other costs (27%). Labor cost increased due to increased cost of living, and mechanization services increased due to increased fuel prices

The bank charges 9.3%** interest for a 6months loan which the farmer pays after harvest (bullet loan) making it manageable

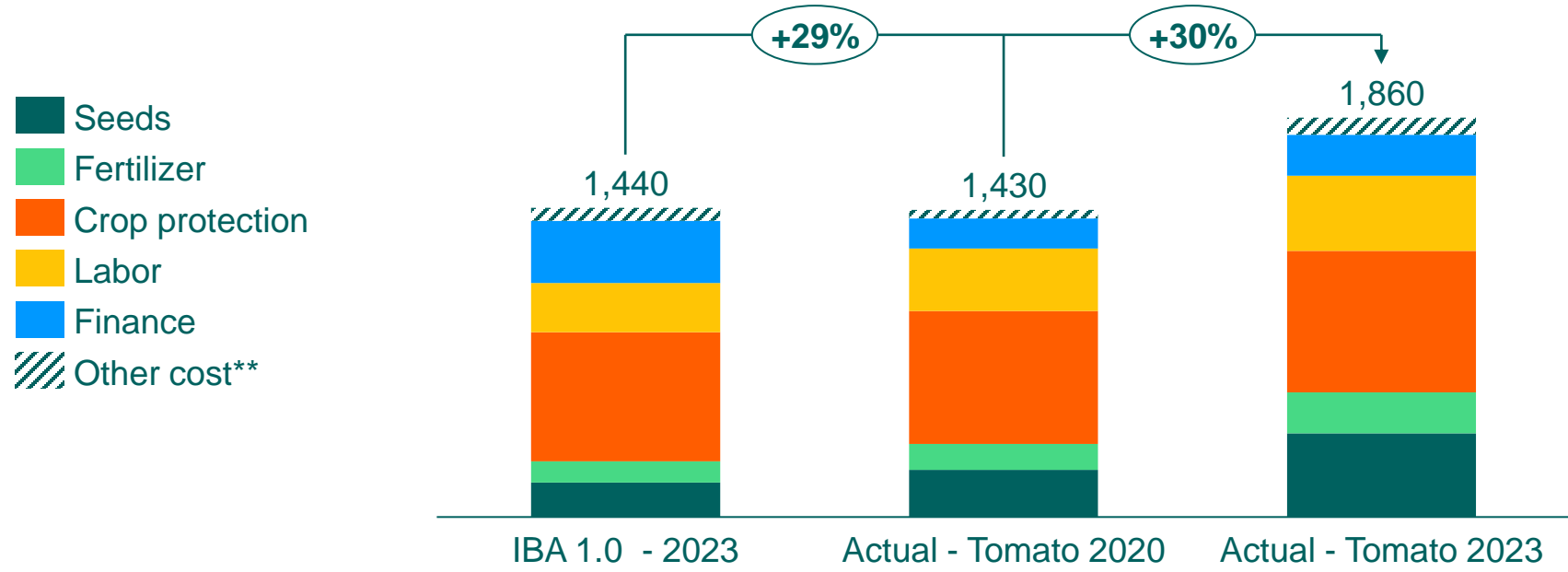
	IBA 1.0 Potato 2023	Actual - Potato 2020	Actual - Potato 2023
Farmgate price (USD/kg)	0.29	0.18	0.31
Marketable surplus (Kg/acre/season)	8,000	3,360	5,760
Profit (USD/acre/season)	1,200	-10	1,020
Profit (USD/MT)	149	-3	176

*Other cost include land lease (potato), transport, soil tests and fuel. **The annual interest is higher than the national annual bank average (14%) but lower than non-bank interest (+20%)
 Note: FFX assumed at 101.83 KES/USD



Income drivers - cost of production | Increasing prices of inputs resulted in 30% increase in cost of production for *tomatoes* by 2023

Cost of production (USD/acre/season)* for tomatoes



Prices of the major inputs increased across the period (application rates and number of applications remained the same). The largest cost increase was on fertilizer (45%), other costs (43%), seed (38%) and labor (18%). Labor cost increased as well due to increased cost of living, and mechanization services increased due to increased fuel prices

Farmgate price (USD/kg)	0.29	0.25	0.51
Marketable surplus (Kg/acre/season)	21,380	15,760	21,280
Profit (USD/acre/season)	5,000	2,400	9,000

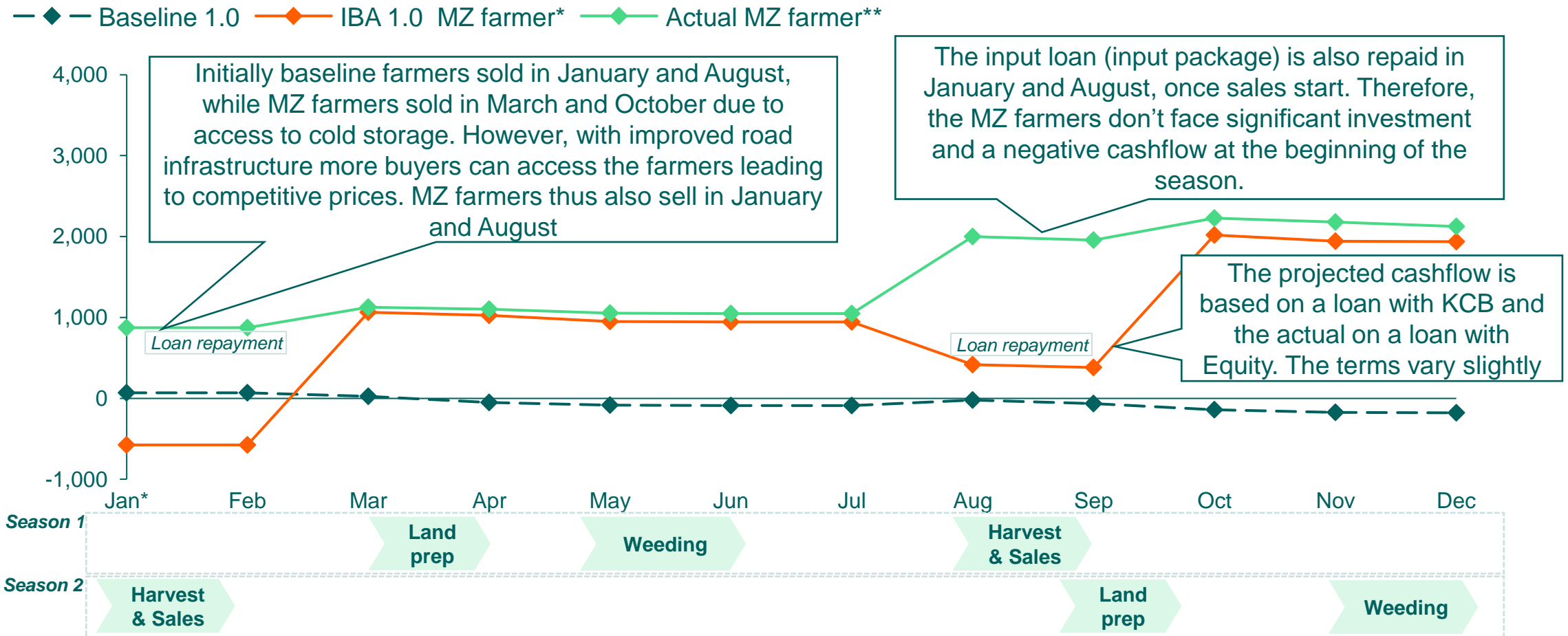
* Actual price changes are reflected here; the currency effect is excluded. (FFX assumed at 101.83 KES/USD)

** Other cost include land lease (potato), transport, soil tests and fuel



Monthly potato cash flow | With improved road infrastructure, more buyers can reach the farmers which has helped smoothen the farmer cashflow as they can sell immediately at harvest

Cumulative net cash flow for a 1-acre potato farm (USD)



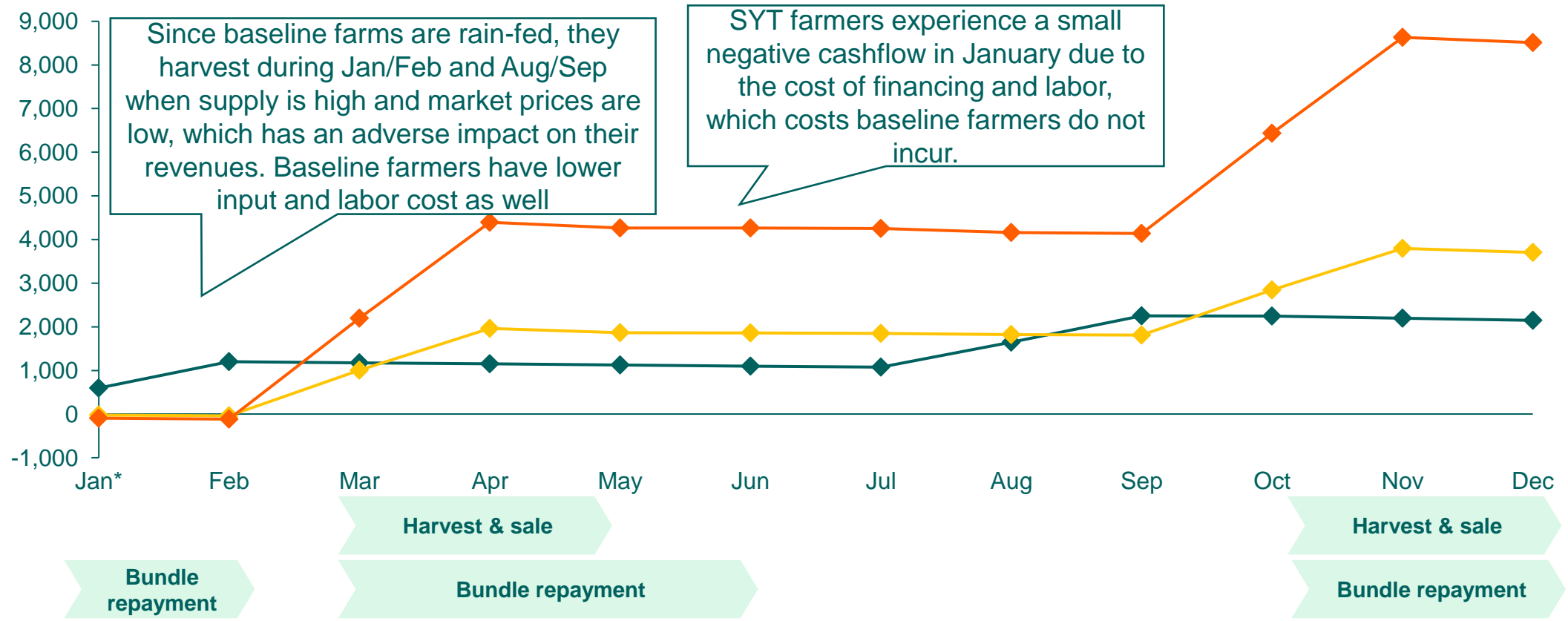
Note: A calendar year has been used to illustrate the cashflow cycle. *IBA 1.0 MZ farmer – farmers receiving financing from KCB. **Actual MZ farmer – farmer receiving financing from Equity Bank



Monthly tomato cash flow | The higher initial investment for MZ farmers results in a negative cashflow in the beginning of the year, but farmers recover these at a rate higher than projected

Cumulative net cash flow for a 0.5-acre farm (USD)

◆ Baseline 1.0 ◆ IBA 1.0 MZ farmer ◆ Actual MZ farmer



Note: Most tomato farmers have access to irrigation and thus depend less on the seasons with some growing upto 4 seasons. The model, however, assumes a farmer with 2 seasons * A calendar year has been used to illustrate the cashflow cycle. Since farmers will grow tomatoes every year, we can expect positive cash from the end of one year to carry over to the next.

Contact us



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IDH Annual Report 2022

This report was created using **think-cell**

Thanks

IDH would like to express its sincere thanks to Syngenta for their openness and willingness to partner through this study.



Partners



Ministry of Foreign Affairs



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5

Annex

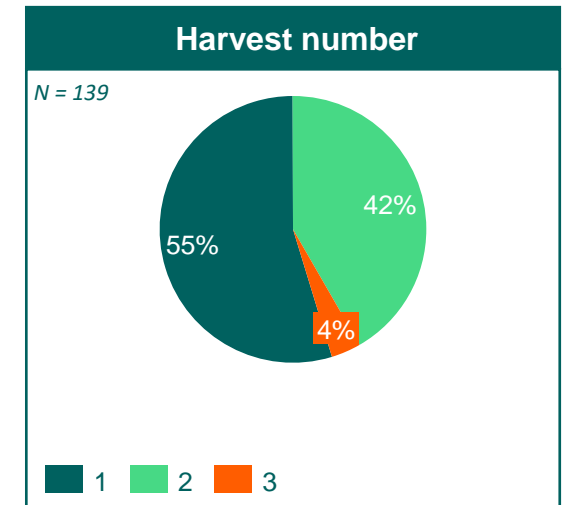
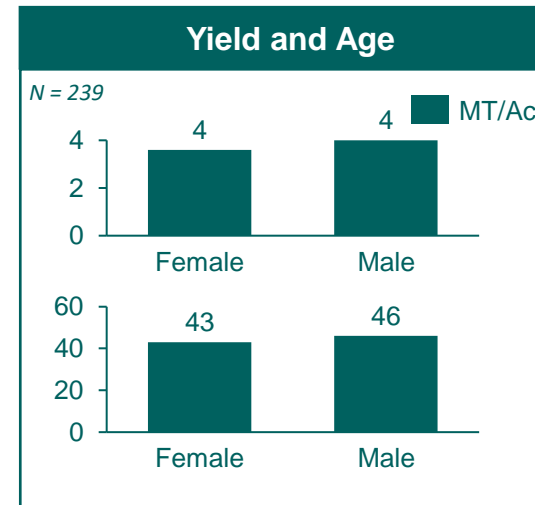
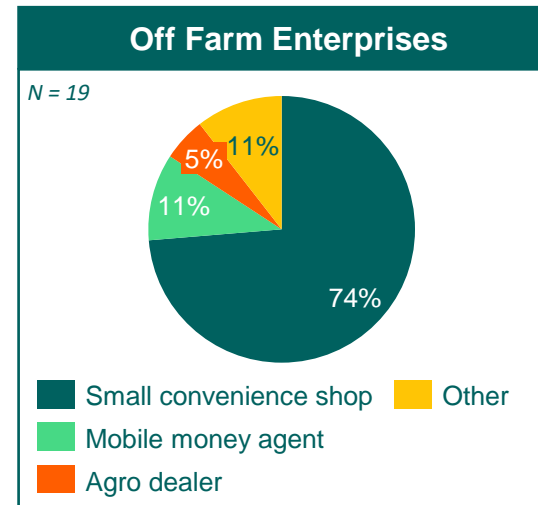
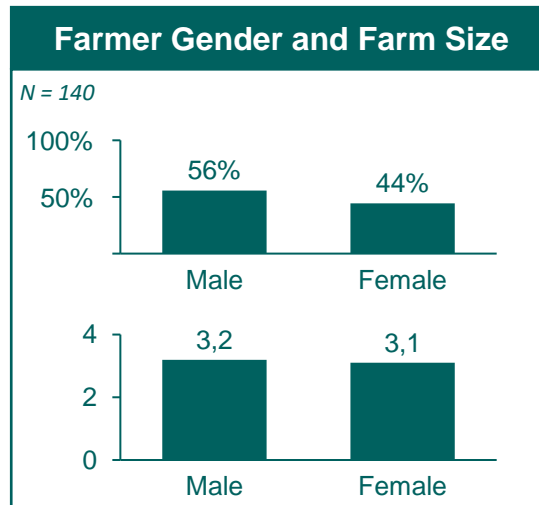
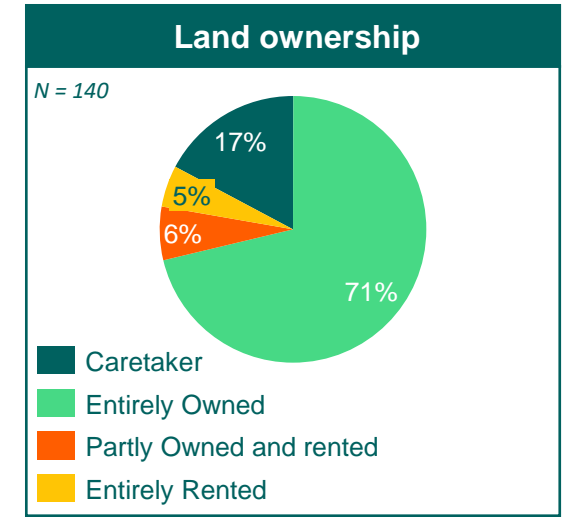
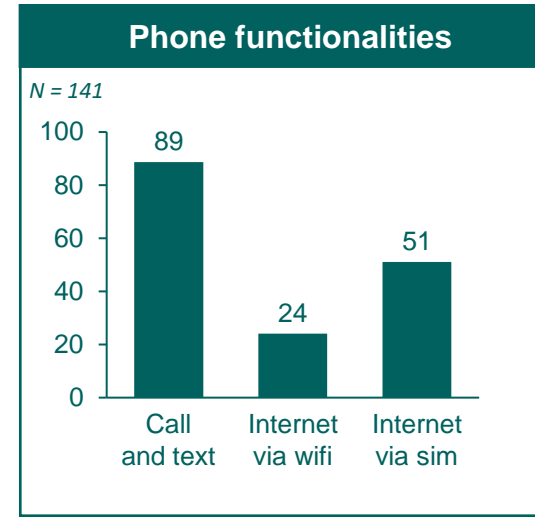
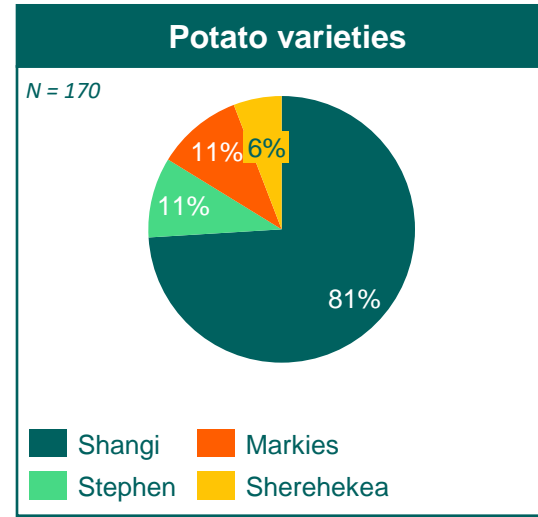
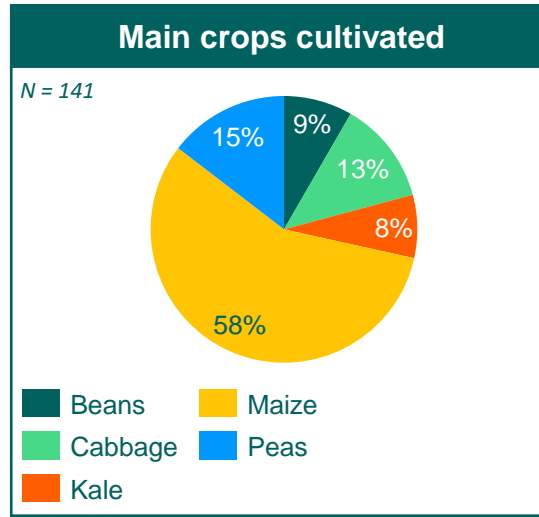


Abbreviations

Abbreviation	Meaning
CESP	Community Extension Service Provider
COGS	Cost of goods sold
CP	Crop Protection
EBIT	Earnings before interest and taxes
FSP	Financial service provider
GAP	Good agricultural practices
IBA	Inclusive business analysis
KES	Kenyan shilling
MT	Metric ton (1,000 kg)
MZ	Mavuno Zaidi
P&L	Profit and loss statement
PHL	Post harvest loss
SDM	Service delivery model
SYT	Syngenta
SHF	Smallholder farmer
SWOT	Strengths, weaknesses, opportunities, threats
USD	United States dollar (currency)



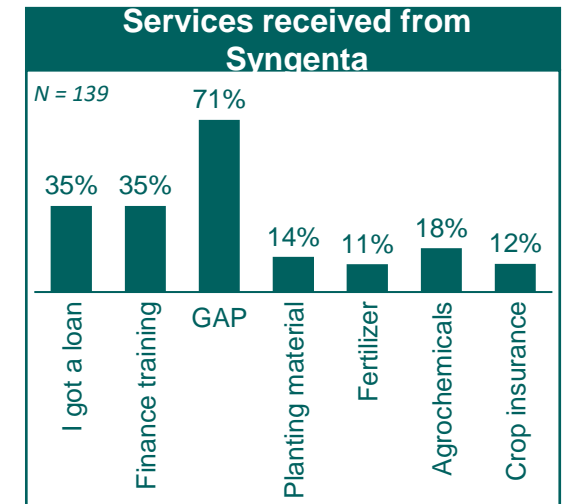
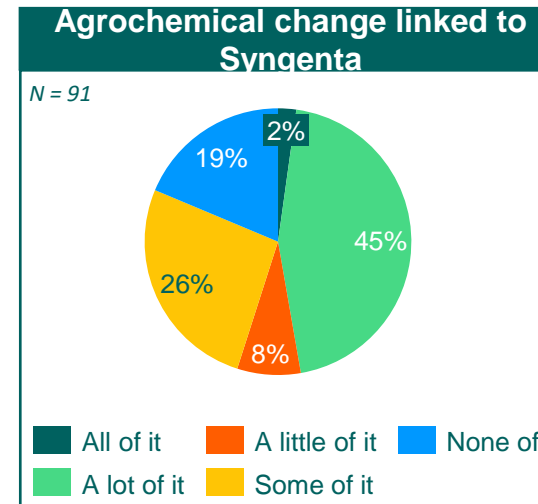
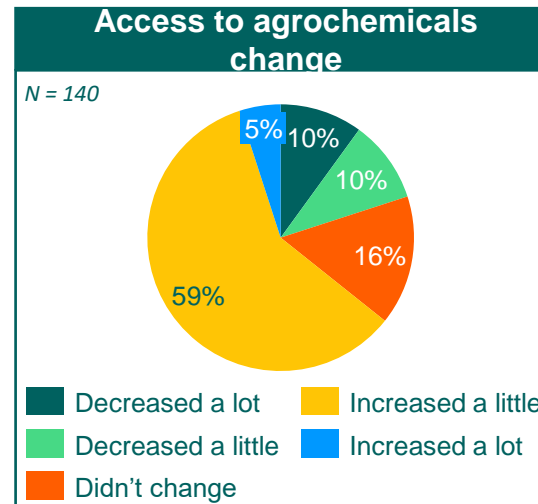
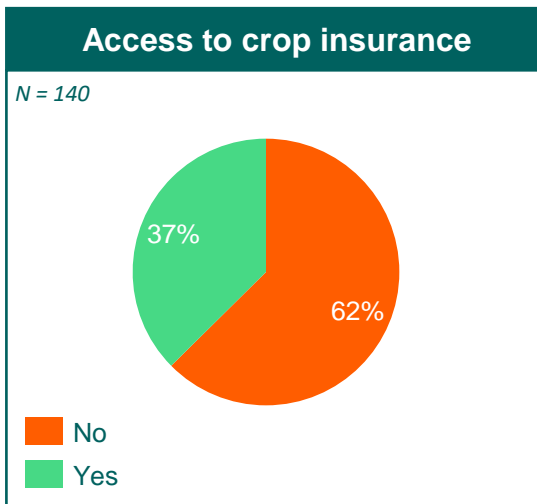
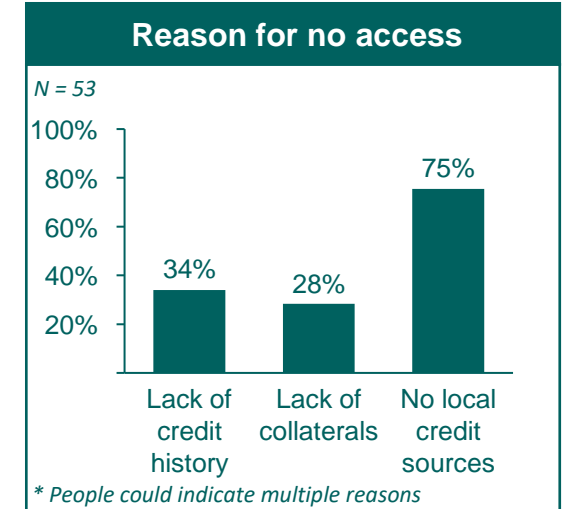
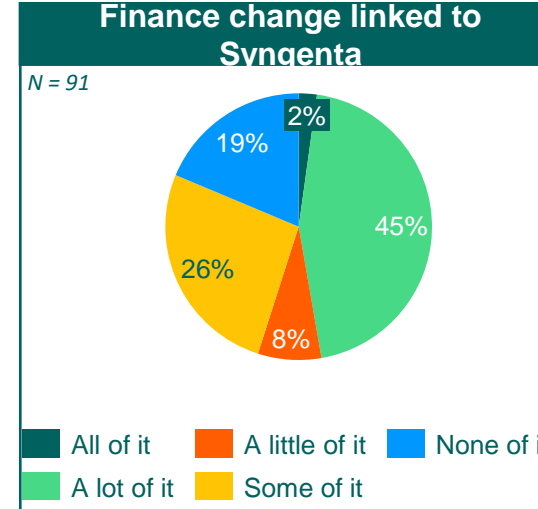
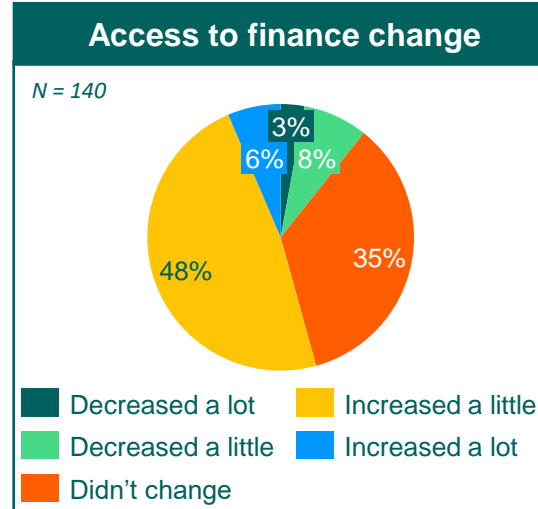
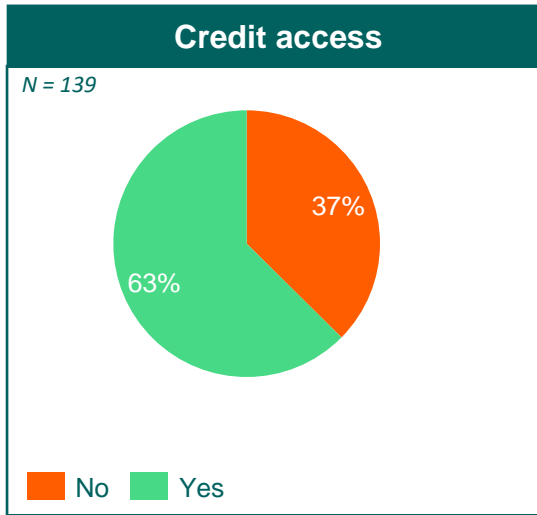
Farmer survey data | Potato farmers' characteristics



Source: Farmer survey carried out by Akvo. More information on the methodology can be found [in the annex](#)



Farmer survey data | Potato farmers' access to services

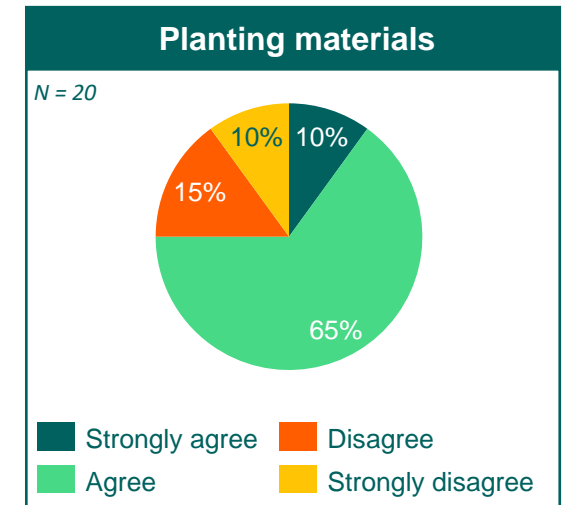
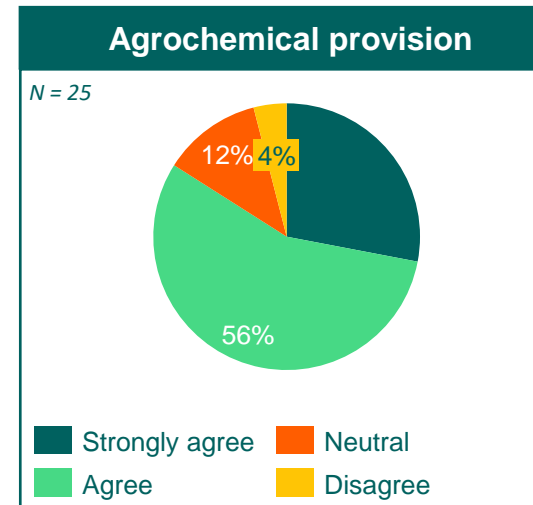
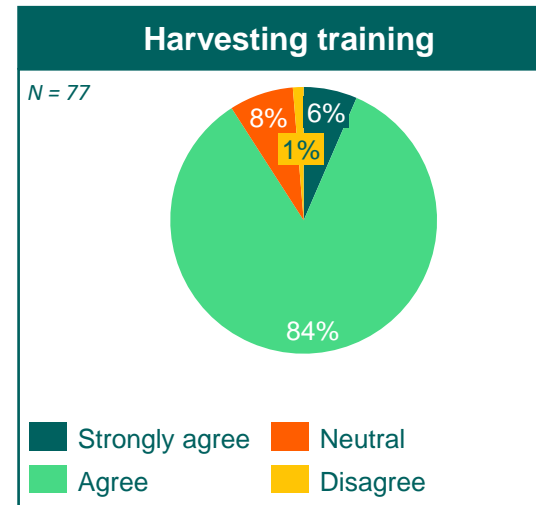
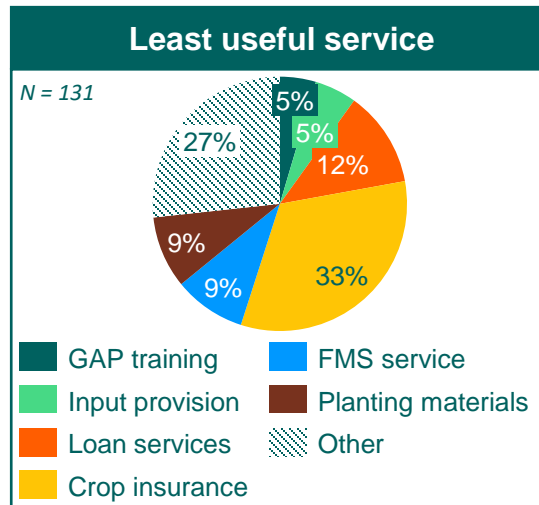
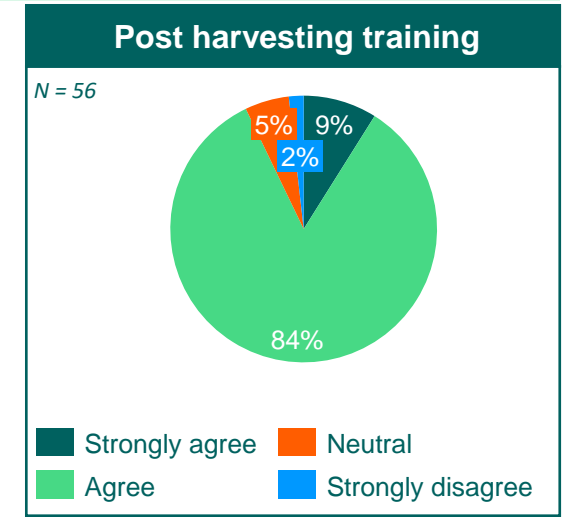
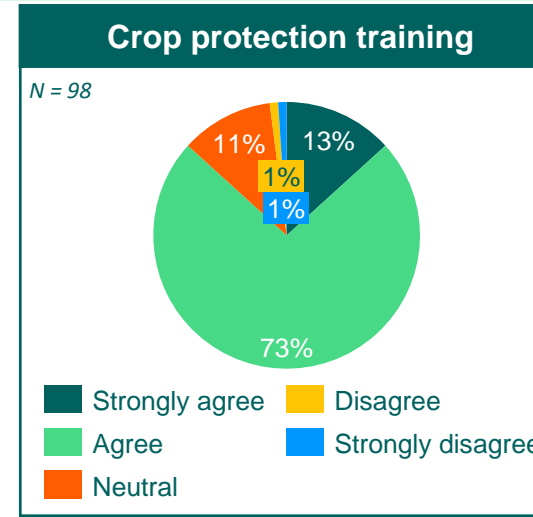
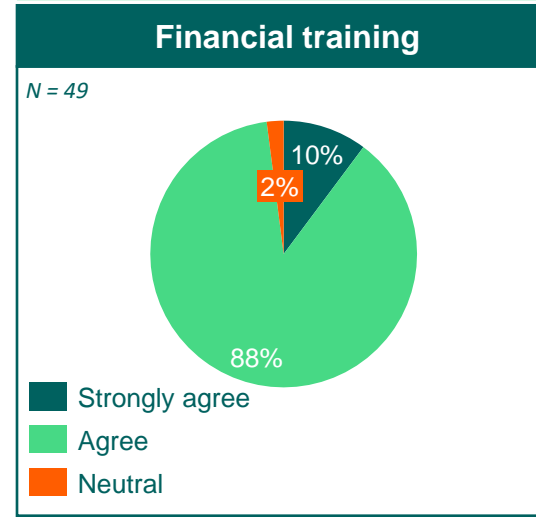
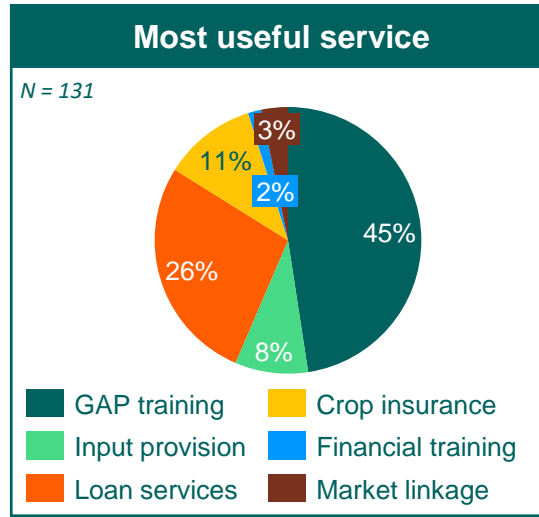


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Farmer survey data | Potato farmers' satisfaction with services

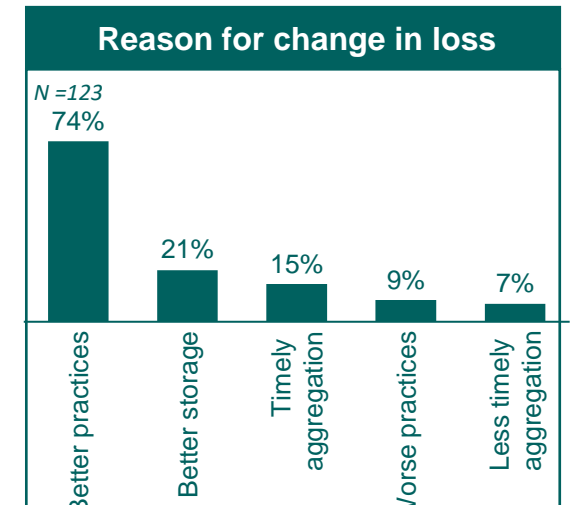
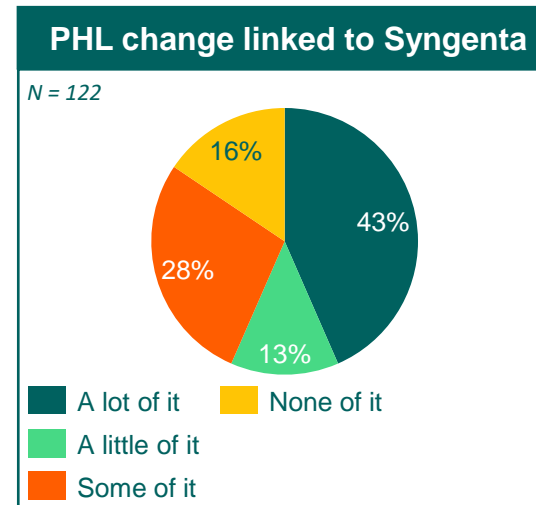
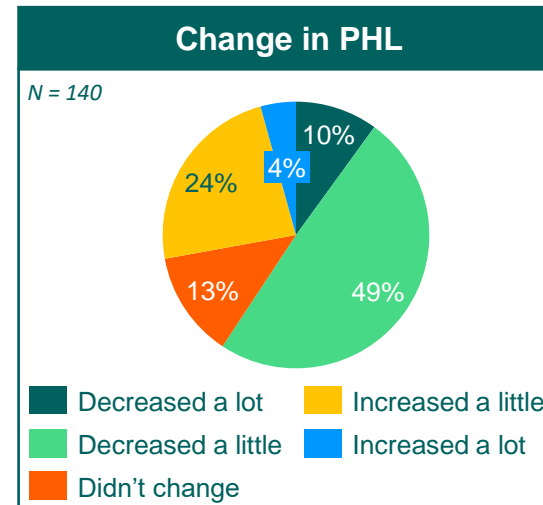
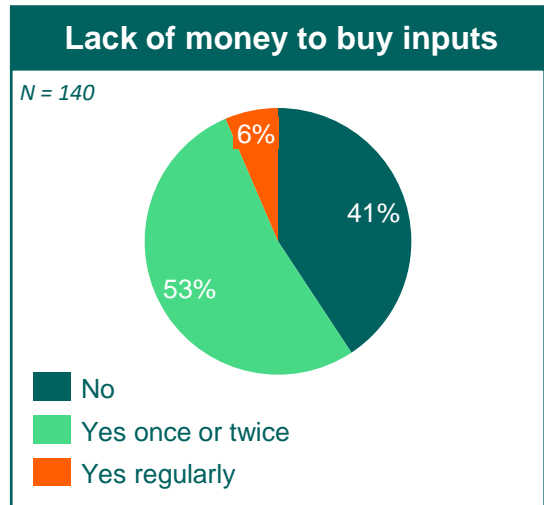
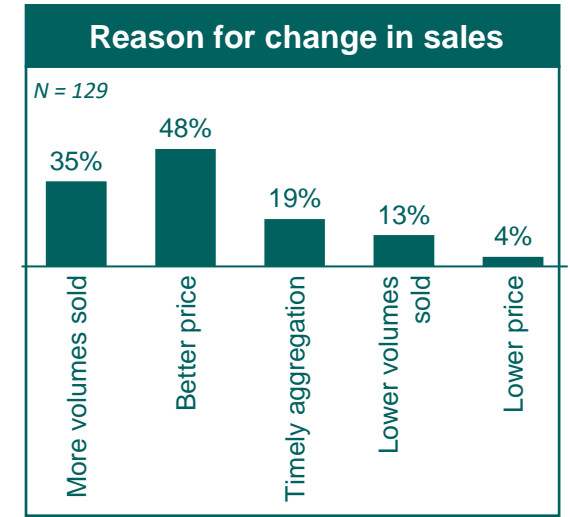
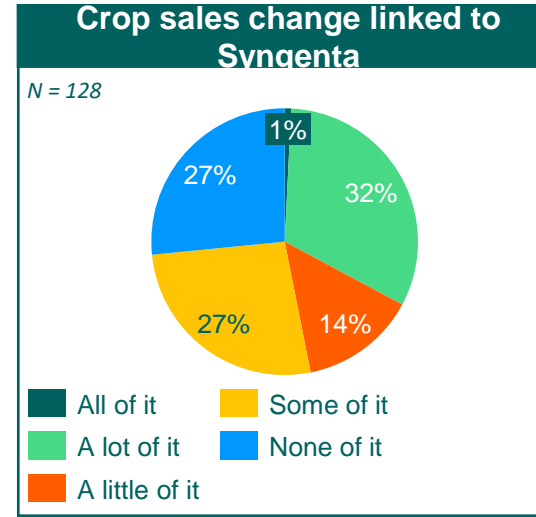
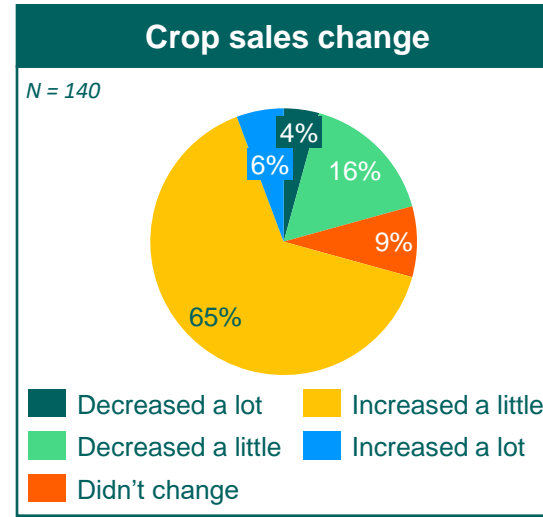
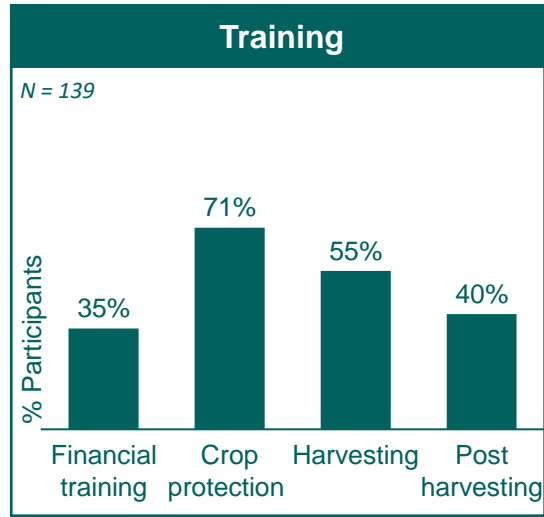
I am satisfied with.....



Source: Farmer survey carried out by Akvo. More information on the methodology can be found [in the annex](#)



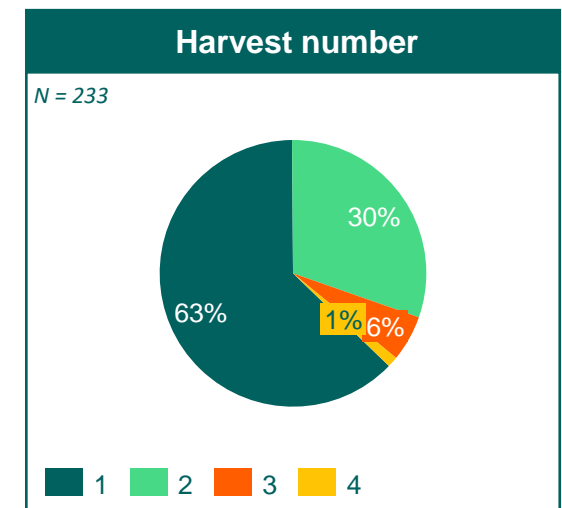
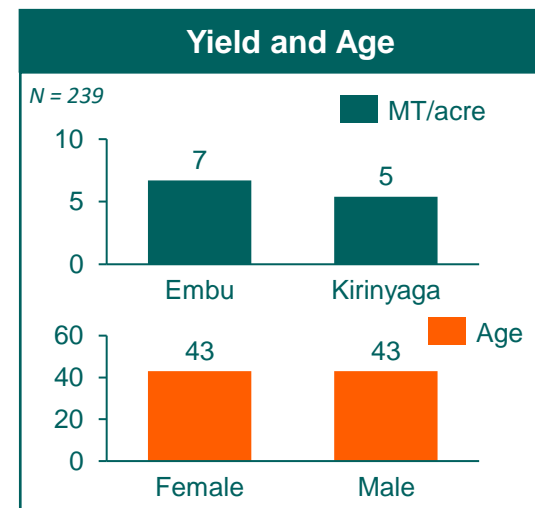
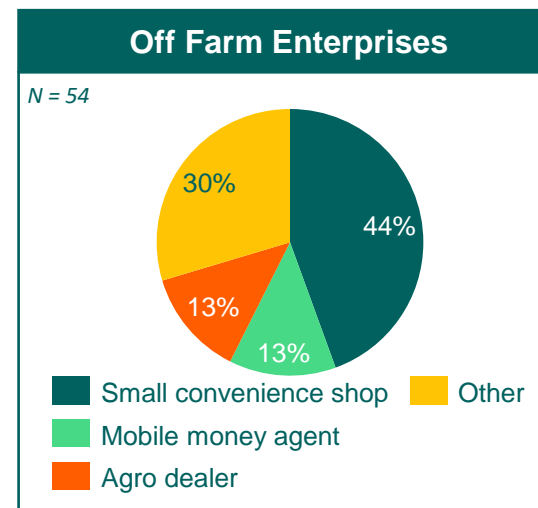
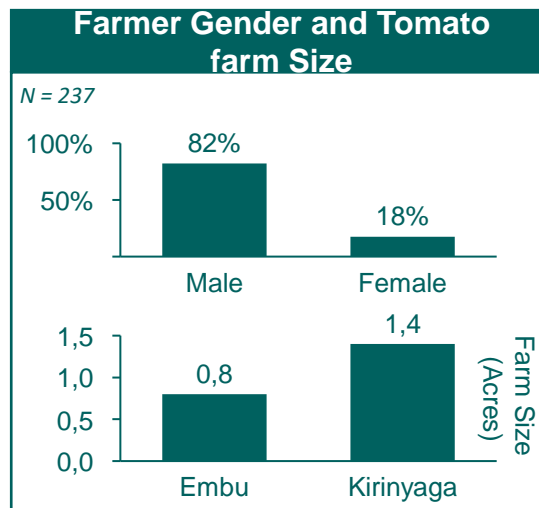
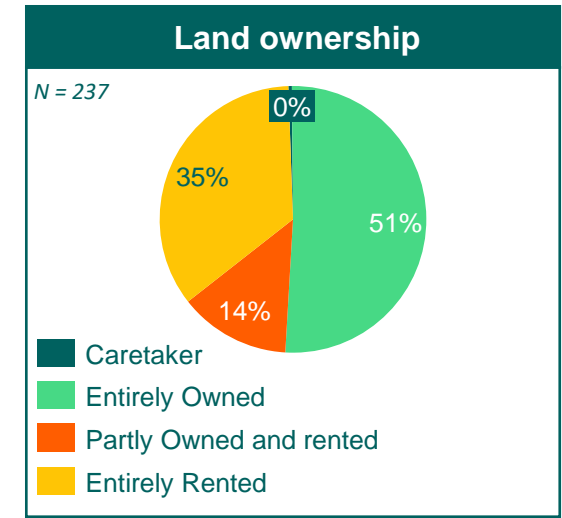
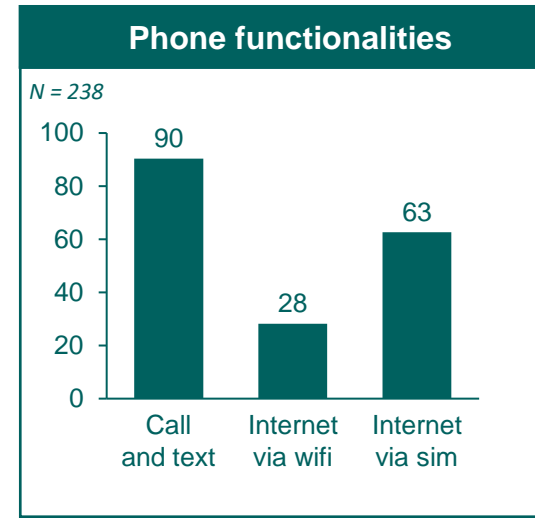
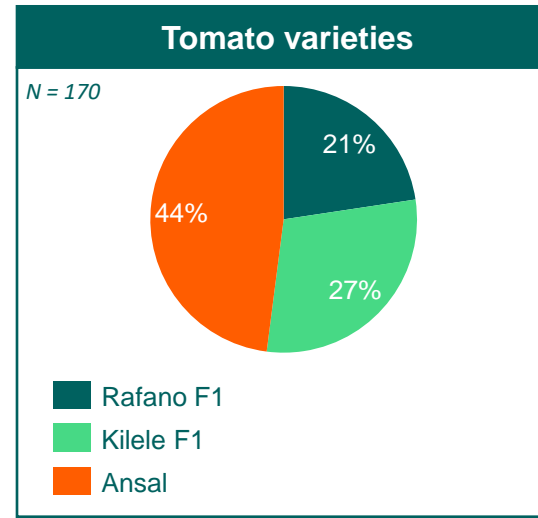
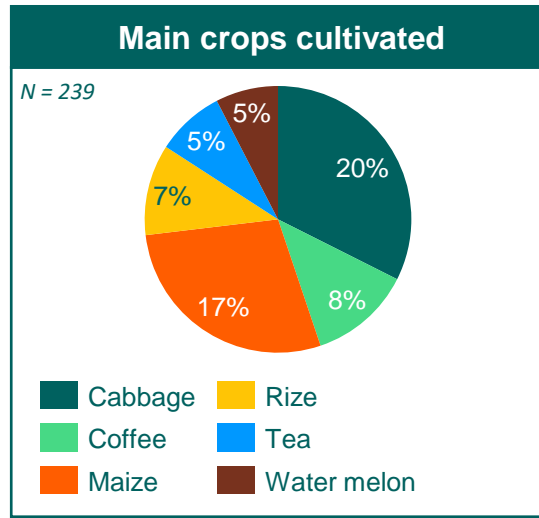
Farmer survey data | Potato farmers' income drivers



Source: Farmer survey carried out by Akvo. More information on the methodology can be found [in the annex](#)



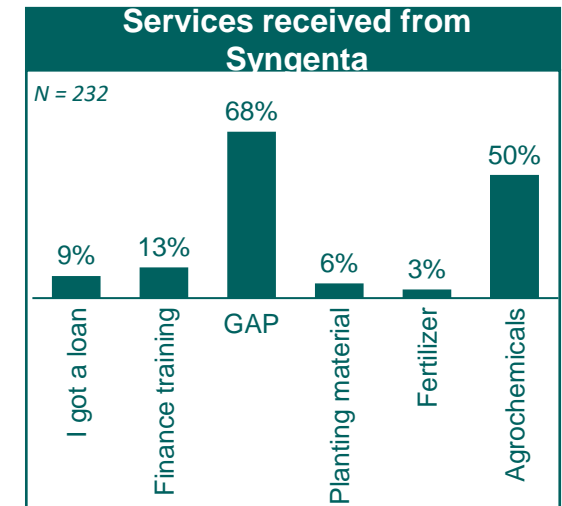
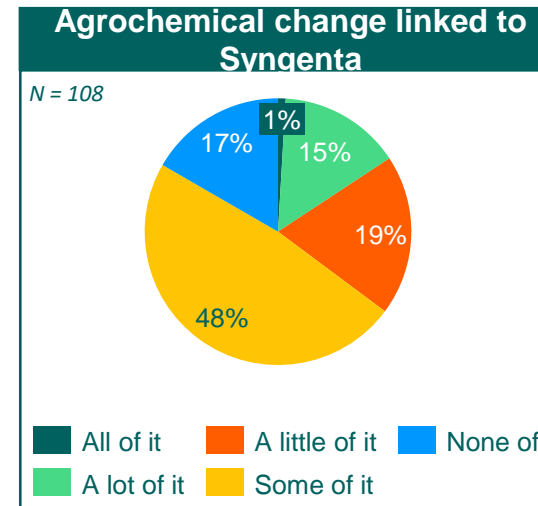
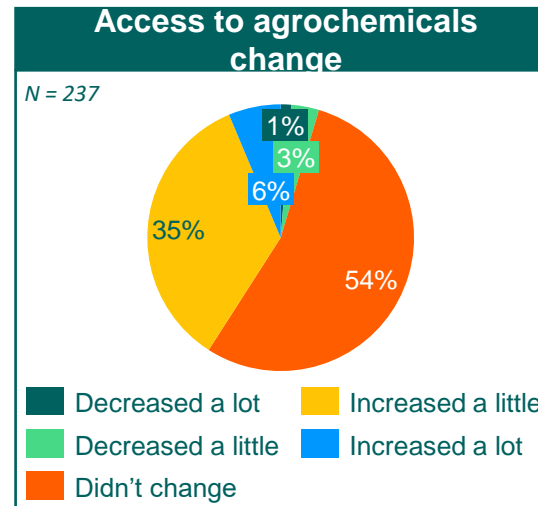
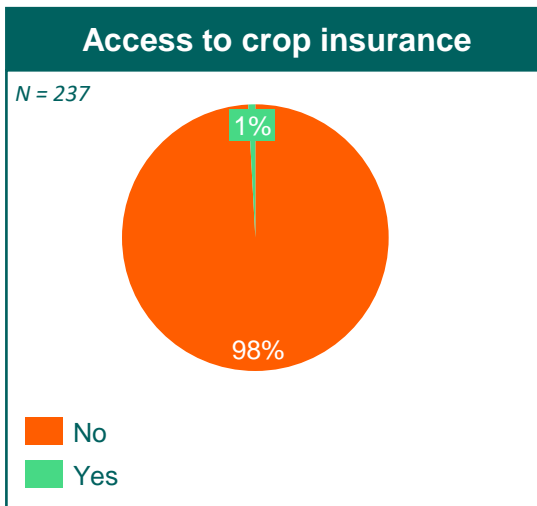
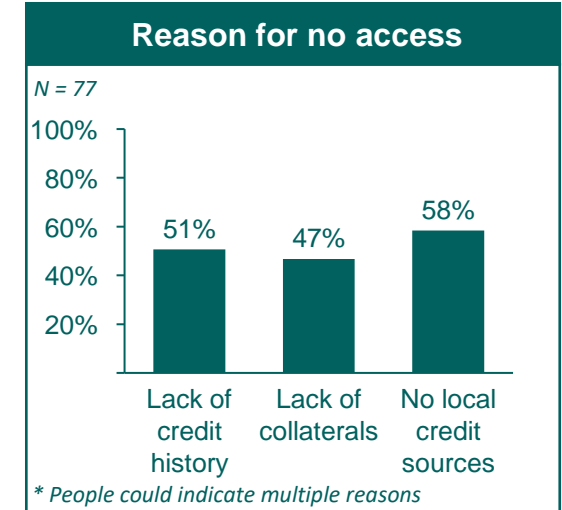
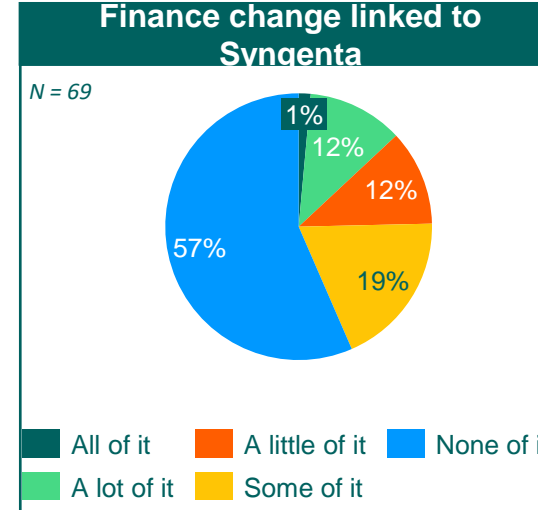
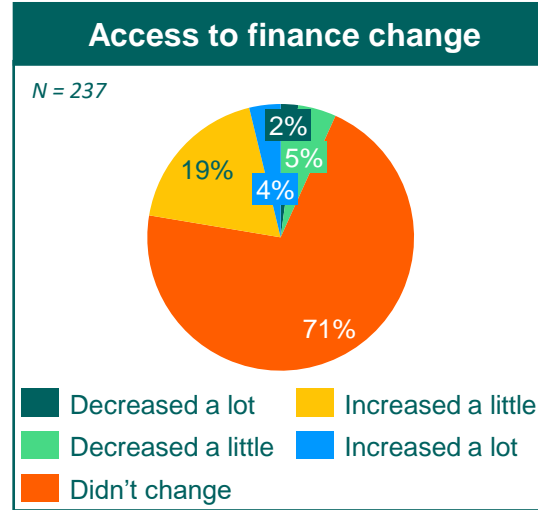
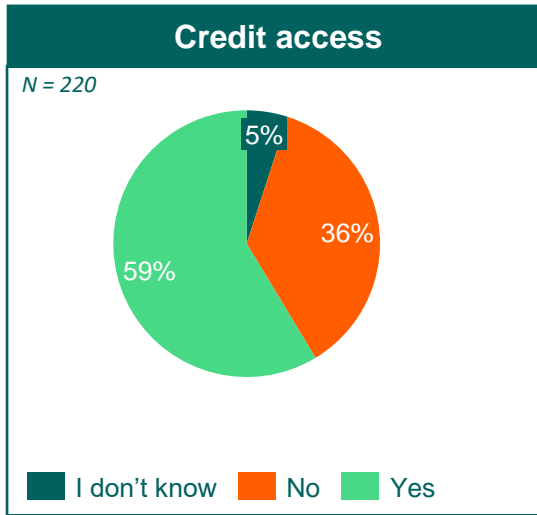
Farmer survey data | Tomato farmers' characteristics



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Farmer survey data | Tomato farmers' access to services

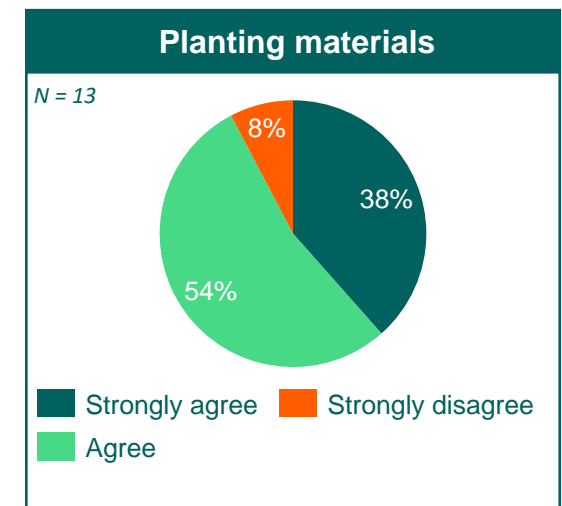
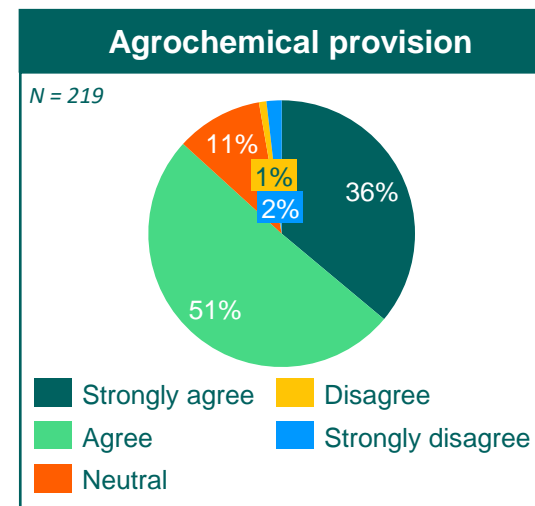
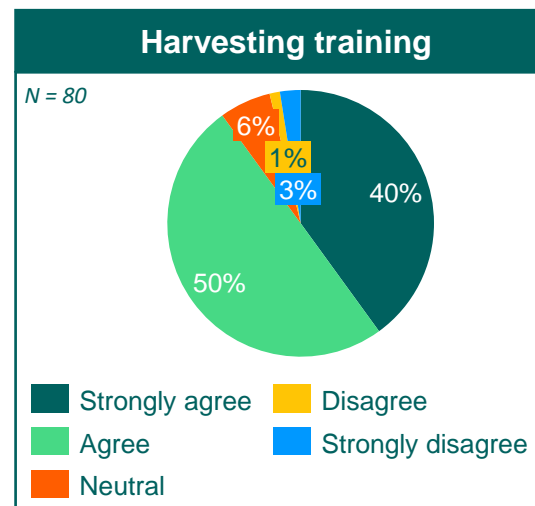
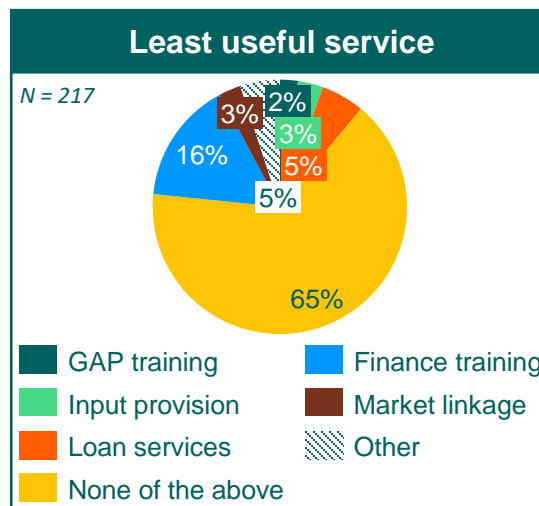
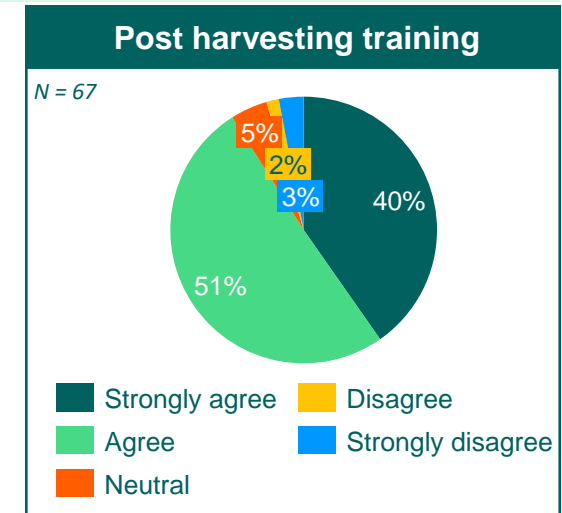
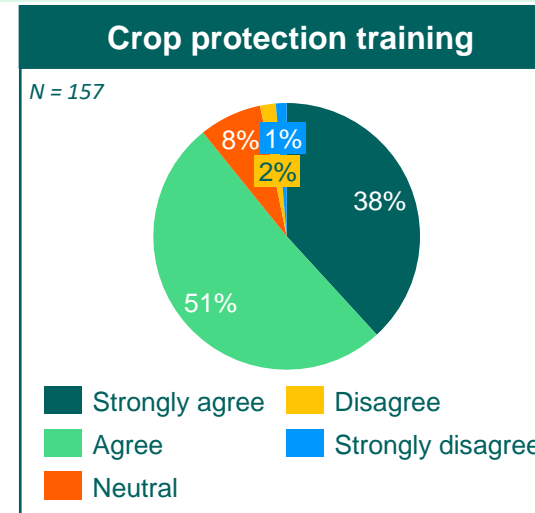
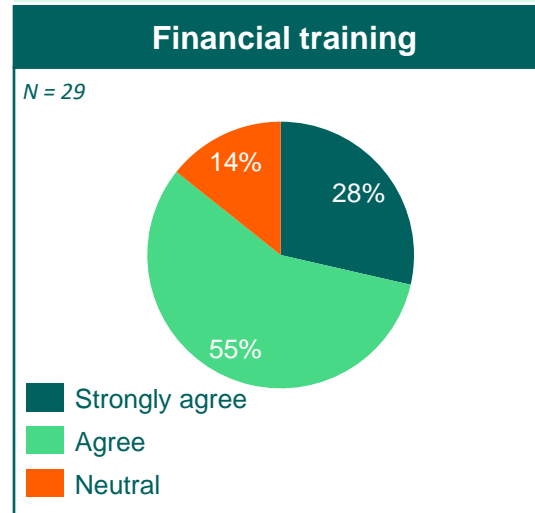
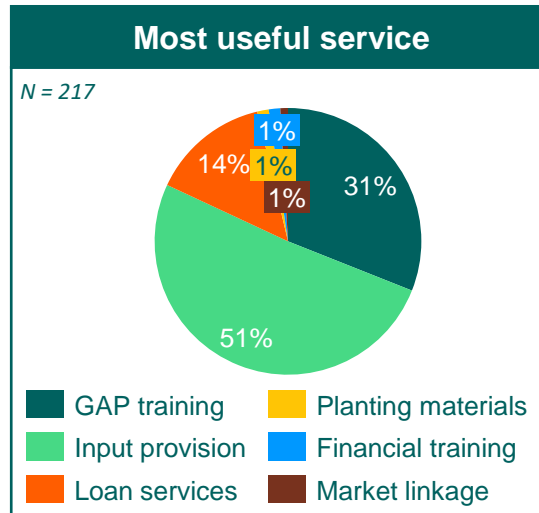


Source: Farmer survey carried out by Akvo. More information on the methodology can be found [in the annex](#)



Farmer survey data | Tomato farmers' satisfaction with services

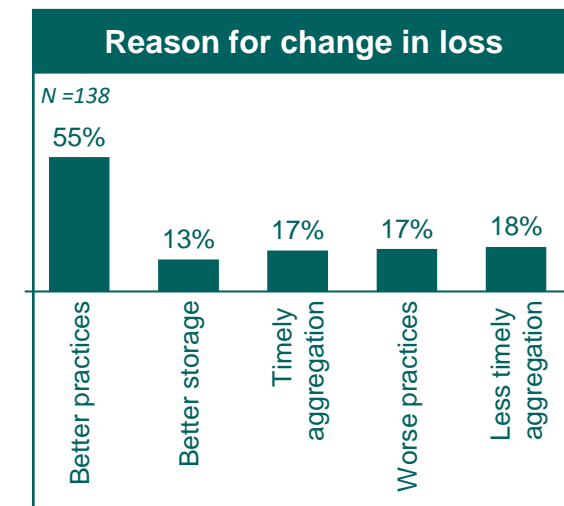
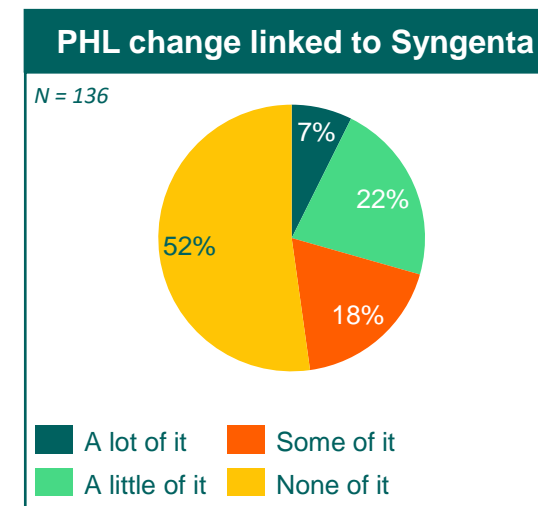
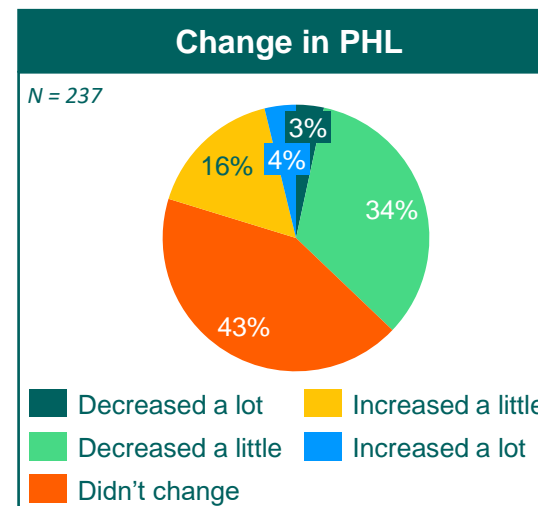
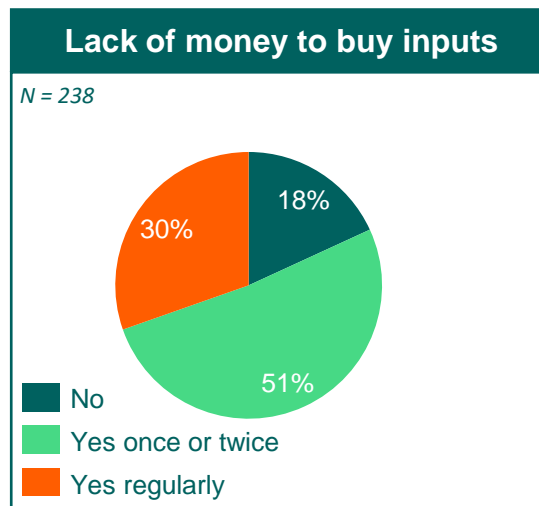
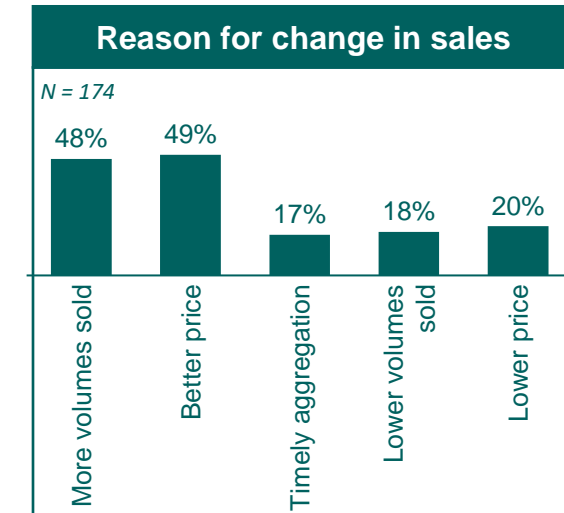
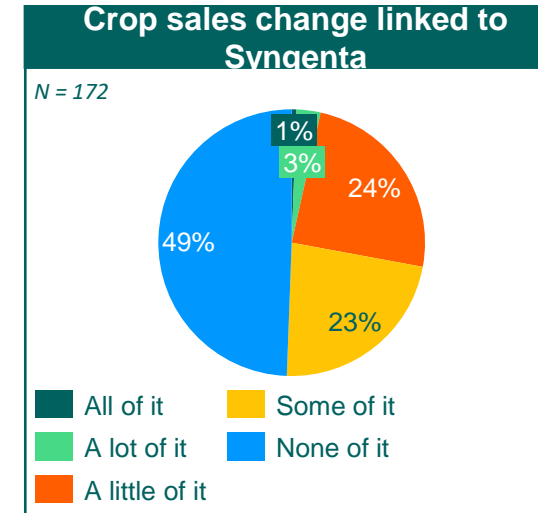
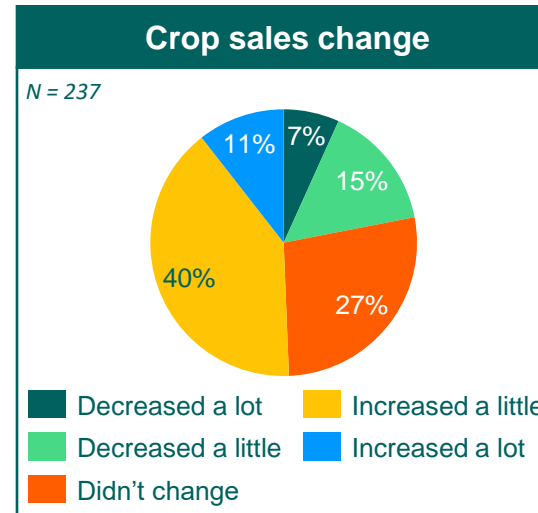
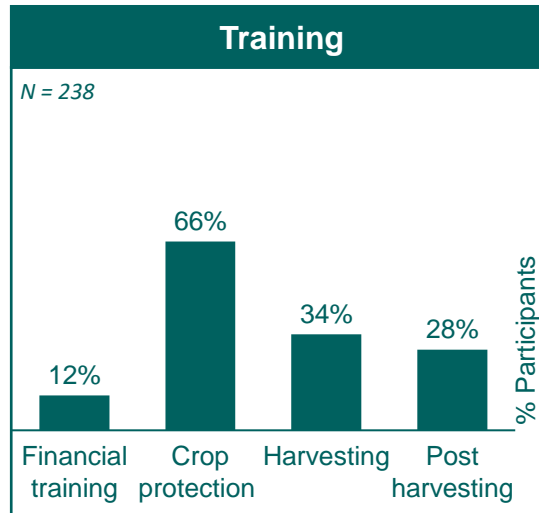
I am satisfied with.....



Source: Farmer survey carried out by Akvo. More information on the methodology can be found [in the annex](#)



Farmer survey data | Tomato farmers' income drivers



Source: Farmer survey carried out by Akvo. More information on the methodology can be found [in the annex](#)



Farmer data

Variable	Unit	Baseline potato	MZ potato	Baseline tomato	MZ tomato
Farm size main crop	Acres	1.3	5.0	0.6	1.5
Share of farmers increasing their farm size	%	100%	100%	100%	100%
Yield	Kg/acre/season	3,700	7,200	7,500	21,600
Post-harvest losses	%	0%	0%	1.5%	1.5%
Home consumption	Kg	50	50	0	0
Volume sold to Syngenta	Kg	0	0	0	0
Farm-gate price	KES/Kg	18	32	25	52
Cost of input package	KES/acre	N/A	16,566	N/A	110,199
Seeds delivered by SYT	Yes/No	No	No	Yes	Yes
Fertilizer delivered by SYT	Yes/No	Yes	Yes	Yes	Yes
Fungicides delivered by SYT	Yes/No	Yes	Yes	Yes	Yes
Insecticides delivered by SYT	Yes/No	Yes	Yes	Yes	Yes
Insurance provided by SYT	Yes/No	No	Yes	No	No
	Unit	2020	2021	2022	2023
Currency exchange rate	USD	106.47	109.65	117.84	138.40



Farmer survey methodology

- **Description:** IDH uses the farmer survey to get an understanding of the farmers involved in the inclusive business model and support with the farmer modelling. It is also meant to capture data related to gender, climate resilience and food security. It serves in this case as endline to measure the impact of an inclusive business model.

Tomato farmers

- Sample size: 238
- Sample location: Embu, Kirinyaga

Potato farmers

- Sample size: 140
- Sample location: Nakuru regions
- **Sample period:** 25th-28th of August
- **Sampling methodology:** Syngenta provided a list of outgrower farms from their database, from which Akvo randomly selected a sample. On these selected outgrower farms several people were interviewed.
- **Data cleaning:** Farmers are either only removed if they refuse to participate in the survey or their farm size is outside of certain parameters. To determine outliers for numerical questions of the survey, a cut off of three standard deviations from the corresponding mean is set.



Gender ladder



Gender unintentional

No steps taken to understand the different needs and preferences of men and women, or target gender gaps/barriers.

Gender intentional

Considers the different needs and constraints of women and men and takes some steps to create gender equality. Such projects adapt to the needs of women and men without seeking to change gender norms or barriers.

Gender transformative

Understands the different needs and constraints of women and men and address the root causes of gender inequality. A gender transformative approach needs to foster changes in **individual capacities (agency)**, **gendered norms and expectations (relations)**, and **institutional rules and practices (structures)**.

Why we believe investing in women can work for business

- By tailoring goods and services to the needs of women, companies can reach a large and often underserved market, potentially increasing revenues from service provision or enhancing their supply security.
- If women had similar access to and control of productive resources as men, yields of female farmers could increase by up to 30 percent. Higher farm yields and incomes create greater business opportunities for companies working with those farmers.
- Companies that are committed to gender equality outperform their peers. Improving gender diversity in the workplace can improve a company's financial performance by up to 25 percent.
- When companies are seen to invest in gender equality, this has the potential to lead to higher levels of farmer and/or worker loyalty. Conversely, unequal opportunities for women can negatively affect companies' reputations which can lose businesses customers as well as workers.