Optimizing vegetable production with agronomy support and market linkages in Kenya

GrowPact Ltd.

Service Delivery Model Analysis

April 2023

PUBLIC REPORT

Disclaimer

Note that this Service Delivery Model was being designed at the time of the analysis. The report explores possible ways of implementing the designed farmer development strategies together with identified value for the SDM operator and other value chain players in the horticulture value chain in Kenya. The analyses provided are based on projections and assumptions; only limited actual data was available.

IDH, GrowPact Ltd., and involved value chain players have used the results of this report to inform their strategy, project design, and future business models, but cannot be held accountable for meeting any targets included in the report.

If you are interested on more detailed information, please contact us.

Introduction

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.

Service Delivery Models

Service Delivery Models (SDMs) are supply chain structures which provide farmers with services such as training, access to inputs, finance and information. SDMs can sustainably increase the performance of farms while providing a business opportunity for the service provider. Using IDH's data-driven SDM 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.

IDH Farmfit Africa

The study was commissioned under IDH Farmfit Africa Program. The program has 3 key pillars;

1. FARMFIT BUSINESS SUPPORT

Farmfit Business Support provides businesses and banks the tools they need to optimize cost-efficiency and maximize the impact of their engagement with SHFs. It helps identify areas ripe for innovation and matches them with the most suitable finance, to bring them to scale. GrowPact is one of the companies selected to receive technical assistance under this pillar. The SDM analysis will help identify opportunities for GrowPact to change and optimize their service delivery model based on which TA interventions will be designed.

2. FARMFIT INTELLIGENCE CENTRE

Farmfit Intelligence Centre shares key insights on how to make smallholder value chains more efficient and effective. Its benchmarking database contains insights from 100+ SHFs engagement models, helping partners innovate in technology and gender inclusion.

3. FARMFIT FUND

Farmfit Fund is the world's biggest ever public-private impact fund for smallholder farmers. The Fund's innovative structure de-risks investments in smallholder farming and helps drive sustainable impact by showcasing the commercial opportunity represented by smallholder farming finance.

Report outline

To navigate between the different chapters, simply click on the corresponding name in the reading guide on the right of each page, and you will be taken to the first page of that chapter

1

Executive summary

Introduction | GrowPact Ltd. and the horticulture sub-sector in Kenya

GrowPact Limited

- GrowPact Limited was established in 2016 and is a leading producer and supplier of high-quality vegetable seedlings based in Kitale, Trans-Nzoia county and supplies its seedlings across Kenya.
- GrowPact is currently working with 5,500 smallholder horticulture farmers and targets to reach 10,000 farmers by 2024.
- The range of vegetable seedlings that GrowPact supplies include tomato, cabbage, peppers, kales, spinach, African indigenous vegetables, among others.
- In addition to providing seedlings, GrowPact plans to expand its service offering for farmers to include agronomy support and market linkages.
- The company is also establishing a laboratory to provide soil testing services to its farmers to tackle soil fertility and land degradation challenges that affect horticultural productivity

Horticulture in Kenya

- Horticulture is the largest sub-sector in agriculture and has created 350,000 direct jobs supporting over 6 million livelihoods in Kenya.
- The sub-sector's three main components are cut flowers, fruits and fresh vegetables where fruits and vegetables are largely produced by small to medium scale farmers.
- Horticulture was the largest foreign exchange earner in 2021, primarily due to the substantial volumes of floriculture exports. The Fresh Produce Exporters Association of Kenya (FPEAK) estimates that only 4% of all the fruits and vegetables produced is exported while the rest is being consumed locally. [1)]
- Vegetable production in Kenya has risen since 1972, from 347,000 tons to 3.34 million tons in 2021, an annual growth rate of 5.46%.[2)]
- Despite the strong performance of the sub-sector, the sector encounters challenges related to productivity and post harvest losses (PHLs) including:
  - limitations on credit availability for financing agri-inputs and capital investments;
  - infrastructure gaps such as irrigation, electricity for cold storage and inadequate processing facilities close to farms;
  - absence of an effective market information system.

Sources: 1) FPEAK; 2) Knoema.com

Recommendations (1 of 4) | GrowPact's service offering contributes to an increase of between 30% and 130% in the net incomes of its farmer segments.

	Observation	Recommendation
Farmer Segmentation	• GrowPact has not been collecting data on its farmers to facilitate farmer segmentation and customization of its service offering. • Based on the analysis covering cabbage and tomato in scope, 36% of its farmers are based in the Eastern region (Embu/Kirinyaga) while 64% are based in Western Kenya • Total average land size is of 2.25 acres. • 58% of farmers carry out tomato farming only, 31% cultivate cabbage only while 11% commercially cultivate both crops. • 98% of farmers in the Eastern region cultivate tomato only with 65% carrying out greenhouse tomato cultivation while 35% grow tomatoes in the open field.	• Implement a farmer segmentation and graduation approach to incentivize loyalty and income increase for farmers and scale and income for GrowPact. • Implement a FMIS with capabilities of tracking seedling inventory, managing farmer orders, scheduling nursery production and tracking farmer production activities. This data can be leveraged to tailor services to farmers to influence loyalty.
Farmer performance	• Greenhouse tomato farmers working with GrowPact increase their net income from KES 234k to KES 539k for small scale farmers and KES 264k to KES 557k for medium scale farmers. • Small-scale and medium-scale open field tomato farmers realize an income increase of KES 372k and KES 381k respectively. • Net income for small- and medium-scale cabbage farmers increases by KES 51k (58%) and KES 59k (51%) respectively • All tomato farmer segments earn an income that is above the LI benchmark while cabbage farmer segments earn an income below the LI benchmark with small scale cabbage farmers earning KES 401k below the LI benchmark	• Conduct a detailed business case analysis for the growing medium[1] (*Mtumbwi* system) for greenhouse tomato farmers • Conduct a detailed business case analysis for farmer training/mentorship to determine farmer willingness and ability to pay for training services • Given the perishable nature of the products, identifying off-taker partners for its farmer base will ensure that risk of produce losses is low

Notes: 1.Growing medium refers to substance through which plant roots grow and extract water and nutrients. In plant nurseries, growing medium can consist of native soil but is more commonly an "artificial soil" composed of materials such as peat moss or compost.
These topics, challenges and recommendations were derived from a set of learning questions that were formulated up front. A list of these learning questions can be found in the annex

Recommendations (2 of 4) | With the opportunities available to increase efficiencies, GrowPact's model presents a positive business case.

	Observation	Recommendation
GrowPact's business case	• The farmer base can be segmented based on location, crops grown, farmer size and mode of farming which all influence the effectiveness and efficiency of service provision. • While GrowPact projects to increase farmer numbers, its sales targets can be met by reaching a much smaller farmer base. • While GrowPact has the capacity to sell more seedlings, its seedlings sales have relied largely on ad hoc demand. With the lead time between order and delivery of seedlings, this has created inefficiencies at the nursery level. Production planning based on sales target numbers and supported by the FMIS can help GrowPact clear the market more efficiently.	• Leverage the FMIS to collect data on types, varieties and volumes of seedlings to be raised to reduce supply gaps and take advantage of higher nursery capacity. • Automating tasks such as processing seedling orders through the FMIS can create more efficient processes • Create market coalitions to ensure farmers get access to markets for their produce. Facilitating access to market builds trust and loyalty and improves the farmer retention rate. • Explore charging commissions for facilitating market access for farmers through the market coalitions created. • Conduct a detailed business case analysis for the growing medium (*Mtumbwi* system) to identify optimum sale strategy for the product. • Reduce overhead costs to increase the business' bottom line.

These topics, challenges and recommendations were derived from a set of learning questions that were formulated up front. A list of these learning questions can be found in the annex

Recommendations (3 of 4) | GrowPact's services have potential to increase impact at the farm-level but there is need for more research for new services under development before roll-out.

	Observation	Recommendation
Service Delivery	• GrowPact's envisioned service offering includes high-quality seedlings, soil testing services, agronomy and post-harvest handling trainings, automated agronomic support and market access. • GrowPact's growing media (*mtumbwi* system) and organic fertilizer units are still in early development stages and will need to undergo research and validation before they can be officially launched. Key considerations include estimating demand for the products, conducting trials and ensuring adequate supply of raw materials for the scale that GrowPact targets. • While services to be provided under GrowPact Academy have been operational in the past in the form of farmer demo days, trainings are targeted to go beyond crop management to support farmers in building farming enterprises and thus will require significant investments. Trainings are expected to increase GrowPact's touch points with its farmer base thus driving the numbers of repeat customers with an assumed attrition rate of 10%. • At the projected scale, farmers are expected to produce a total of 26k tons of tomatoes and 15k heads of cabbages creating the need for efficient market access	• Engage farmers in the design of trainings and other services/products to ensure relevance and drive uptake • Adequately plan for the resources required to deliver these services to farmers to ensure efficiency • Build and showcase the evidence of a successful service delivery model to attract financing partners for a potential working capital facility for its farmer base • Create market coalitions to ensure farmers get access to markets for their produce. Facilitating access to market to farmers builds trust and loyalty and improves the capacity of GrowPact to retain its farmer base

These topics, challenges and recommendations were derived from a set of learning questions that were formulated up front. A list of these learning questions can be found in the annex

Recommendations (4 of 4) | The FMIS is expected to reduce the cost to serve by streamlining and automating some operations.

	Observation	Recommendation
FMIS	• While the cost to serve increases per segment, it is expected that these costs will be recovered from the farmers through an extended relationship with the farmers. • Implementing a FMIS will help streamline operations through the supply chain from nursery to seedling and improve GrowPact resource allocation strategy. This is expected to reduce GrowPact's cost to serve farmers specifically through inventory management, production planning, quality control and creating market access for farmer produce	• Customize the FMS based on identified needs to capture the crucial data points that need to be collected. • Create ownership at the farmer level through sensitizing farmers on the importance and benefits of using the system to drive behaviour change and enhance acceptability.

These topics, challenges and recommendations were derived from a set of learning questions that were formulated up front. A list of these learning questions can be found in the annex

Innovations: The innovations to be deployed by GrowPact will result in benefits not only to the company but to its farmers who are expected to increase productivity and reduce production costs resulting in higher profitability

	Organic fertilizer	Growing media	GrowPact Academy
The innovation	Scaling up of production and marketing of organic fertilizer to horticulture farmers in Kenya	Trialing, piloting, production and marketing of growing media to greenhouse horticulture farmers in Kenya	Trialing, piloting, production and marketing of growing media to greenhouse horticulture farmers in Kenya
Envisioned outcomes	**GrowPact**: Tapping into a new and promising market, diversifying their product and thus revenue mix. In doing so it provides more farmers with access to organic fertilizer and growing media; **Farmers**: enhancing their farm's soil health in a cost-effective way which in turn increases productivity	**GrowPact**: Coupled with soil sterilization and testing services, growing media allows for diversification of its revenue mix while offering greenhouse farmers better management of their production process. **Farmers**: Better pest and disease management resulting in lower production and investment costs in the long-run which increases productivity and profitability	**GrowPact**: Increasing farmer knowledge of crop management which in turn increases demand for seedlings. **Farmers**: Increased knowledge of good agricultural practices and financial management resulting in increased productivity and profitability and better management of the farming enterprise.

2

The Service Delivery Model

Objectives and/or targets | GrowPact aims to build a business model that enhances inclusivity and profitability both at the farm and business level

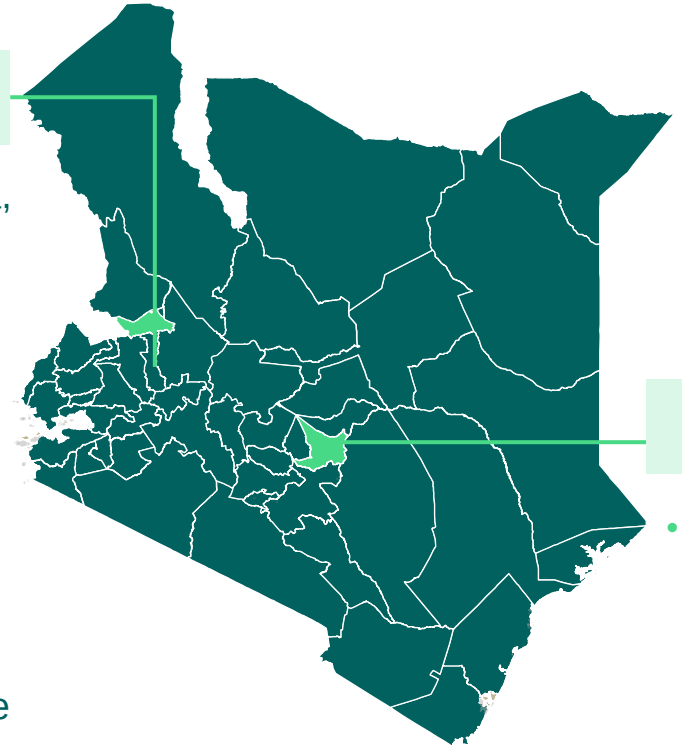
	Objective	Farmers	GrowPact	IDH
Core objective	Increase the commercial viability of the business through increased sales of affordable seedlings.	• Higher use of high-quality inputs by farmers • Improved yield and income resilience	• Improved farmer loyalty • Stable sales growth	• Contribute to security of supply of horticultural food crops to local markets
Secondary objectives	Increasing productivity, profitability and resilience of smallholder farmers.	• Better yields and income resilience	• Increased sales of seeds, fertilizers and crop protection • Improved farmer loyalty	• Contribute to security of supply of horticultural food crops to local markets
	Improve market linkages to connect buyers to producers	• Improved bargaining power with buyers • Higher prices / premiums for produce	• Increased farmer interest to take part in SDM	• Increase supply of horticultural food crops in Kenya
	Increase sustainability of farming practices	• Increased awareness of good agricultural practices • Provided access to organic fertilizer	• Diversification of product portfolio	• Increased sustainability of the horticulture sector

Sources: GrowPact interviews (2022)

Location | GrowPact has its primary nursery operations in Kitale for supply across the country and plans to expand to Embu in the near-term

Trans-Nzoia County

- GrowPact primary operations are in Kitale, Western Kenya, where the business engages in seedling propagation.
- The standard operations are complemented by a training center and an upcoming laboratory for soil testing and tissue culture seedling production.
- The business' propagation unit employs 2 models:
  - fully fledged nursery services supplying ad-hoc demand for seedlings;
  - propagation services for farmers who place advance orders and supply their own seeds.
- With most of the vegetable seedling operators based in the counties of Kiambu, Nakuru and Kajiado, GP's location allows the company to strategically target the Western region which is traditionally a maize and sugarcane producer but with potential for vegetable production.



Embu County

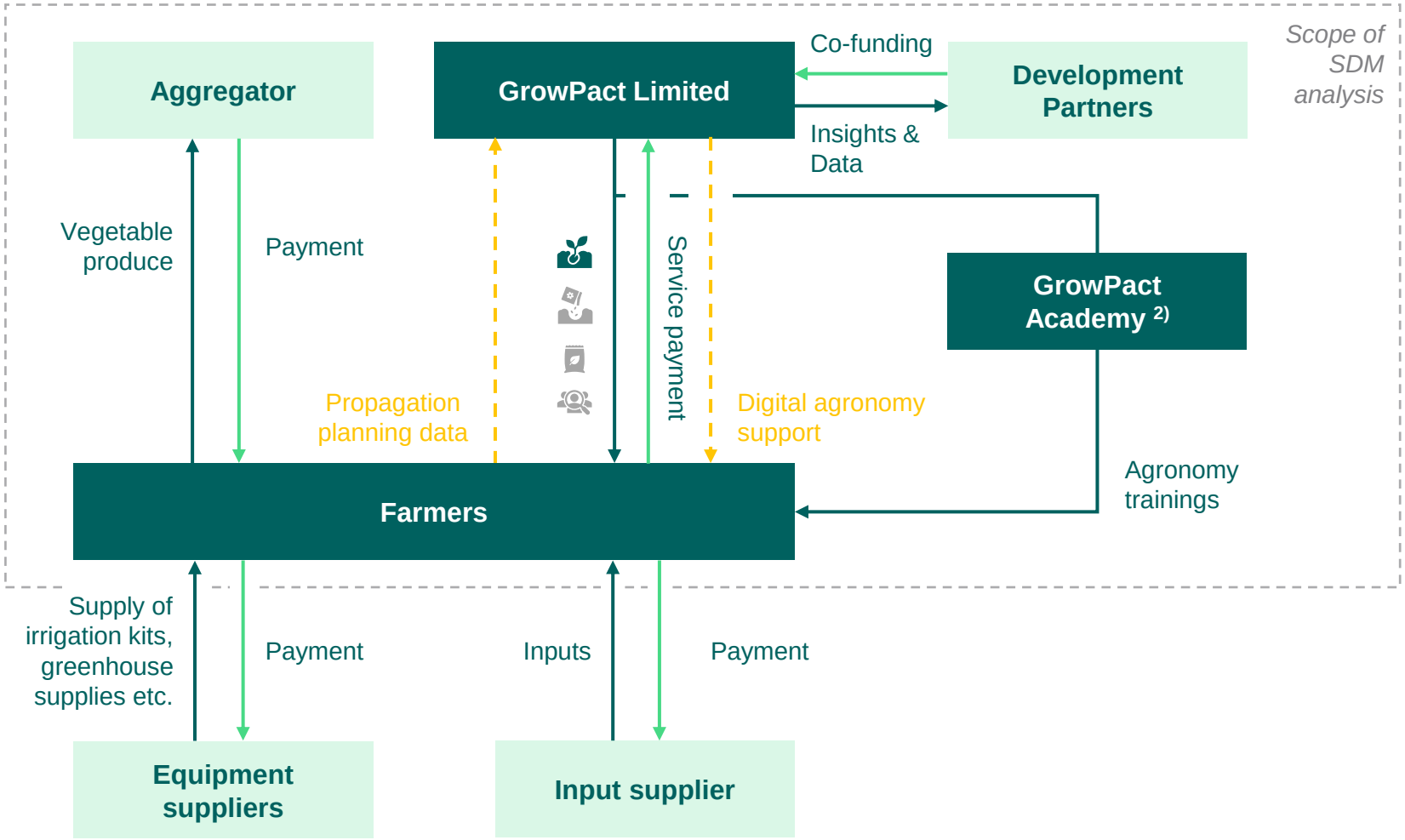
- GP operates a distribution center in Embu county which serves farmers in the Mt. Kenya region.

Sources: 1. GrowPact interviews (2022). 2. Kenya editable map 3. GrowPact produces seedlings for tomato, cabbage, peppers, kales, spinach, African indigenous vegetables, among others.

SDM overview | GrowPact plans to incorporate agronomy trainings, soil testing and sterilization services and market linkages to complement its existing seedling propagation business.

Legend:

- Goods & services
- Money
- Data & information
- Operational
- Under development
- Soil/Water testing [1)]
- Organic fertilizer and growing media
- Market linkages
- Seedlings



Note: 1) Soil and water testing includes the possibility to perform soil sterilization
Source: GrowPact interviews (2022)

Stakeholders | While GrowPact works largely with farmers, there is potential to collaborate with a broad range of partners to improve the productivity of the farmers they work with.

Actor	**Legal status**	**Function** (within this SDM)	**Revenue model** (within this SDM)	**Incentive to participate** (Within this SDM)
Horticulture Farmers	Individuals	• Receive services, training and input • Provide produce	Profit from sales of produce	Improve income and thereby livelihood
Farmer Groups	Individuals or registered FOs	• Delivery of trainings • Distribute inputs • Provide farmers with loans	Subscription fee by SHF members	Obtain training and sometimes inputs based on group savings, de-risking individual farm operations
Off-takers	Limited company	• Demand offtake	Profit from sales of produce	Improved quality and quantity of produce
FMS provider	Limited company	• Traceability platform, management information system to document interactions with farmers	Annual subscription fees	Revenue from offering service
IDH	Non-profit	• Supporting design of SDM • Knowledge partner • Potential future TA (technical assistance) funding	N/A	Improve farmer productivity and profitability through service delivery

Source: GrowPact interviews (2022)

Farmer relationships | With the additional services in its portfolio, GrowPact will need to develop robust procedures to enable efficient service delivery

Outreach

- GP lacks an outreach strategy and demand for its products has largely been through word-of-mouth referrals.
- Successive sales to customers are supported by a Sales team.
- There are opportunities to acquire new customers by marketing GP through digital platforms.

Selection

- GP has not explicitly specified selection requirements.
- All farmers who require GP services will receive these under the SDM initially based on the farmers' willingness and ability to pay and subsequently subject to the graduation model to be employed.

Contracting

- GP does not have any formal contracts with its farmers and sales orders are assumed to be binding.
- With the graduation model and the move towards forward contracts for propagation services, there will be need to develop a robust contracting process.

Segmentation

- GP currently lacks a segmentation strategy and gleans farmer size insights from sizes of orders
- SHFs can be segmented based on their crop grown, size of operations (small/medium-scale) and the growing method (greenhouse/open field) as these factors influence training costs and the costs of inputs (seedlings, growing media and organic fertilizer).

Graduation

- GP's current cash-based model of supplying only seedlings creates no need for farmer graduation.
- Other service add-ons create opportunities for farmer graduation based on farmer loyalty and timely repayments which provide access to discounts, extended repayment periods and mentorship.

Data collection

- GP does not have a robust data collection system. Through the FMIS to be acquired, GP aims to collect more data from its farmers in a standardized manner.
- Over time, the FMS should allow GP to build a more intentional selection, segmentation and potential graduation of farmers.

Source: GrowPact interviews (2022)

Services | GrowPact's business model is anchored on four core services of which most are currently under design and development.

Category	Service	Impact	Implementation	Revenue model	Status
Training & information	**Agronomy training**	Increase good management practices to utilize impact of access to other services.	GP Academy	Training fee	Piloting in 2022
	Financial literacy training	Increase understanding of farm economics and the business case of horticulture farming to increase understanding of repayment of loans and rational behind investments	GP Academy	Training fee	Under development
	Digital agronomy services	Increase good management practices to utilize impact of access to other services.	GP Academy	Potential subscription fee	Under development
Inputs	**High quality seedlings**	Increase the yield of farmers accessing seeds through GP	GP Nursery	Seedlings sales	Operational
	Growing media and organic fertilizer	Increase the yield of farmers accessing seeds through GP	GP Nursery	Sale of products	Under development
	Soil testing services	Reduce the risk of crop losses due to diseases	GP Lab	Testing fees	Under development
Financial services	**Financing for seedlings**	Support farmer working capital to enable access to quality seedlings.	GP Nursery	None	Under development*
Market access	**Market coalition**	Secure off take of increased horticulture produce for a market fair prevailing price	GP and off-taker partners	None	Under development

*Note: *This service will potentially be provided to farmers based on performance*
Source: GrowPact interviews (2022)

Farmer segments | Farmers are segmented based on type of crop grown, growing method and scale of operations

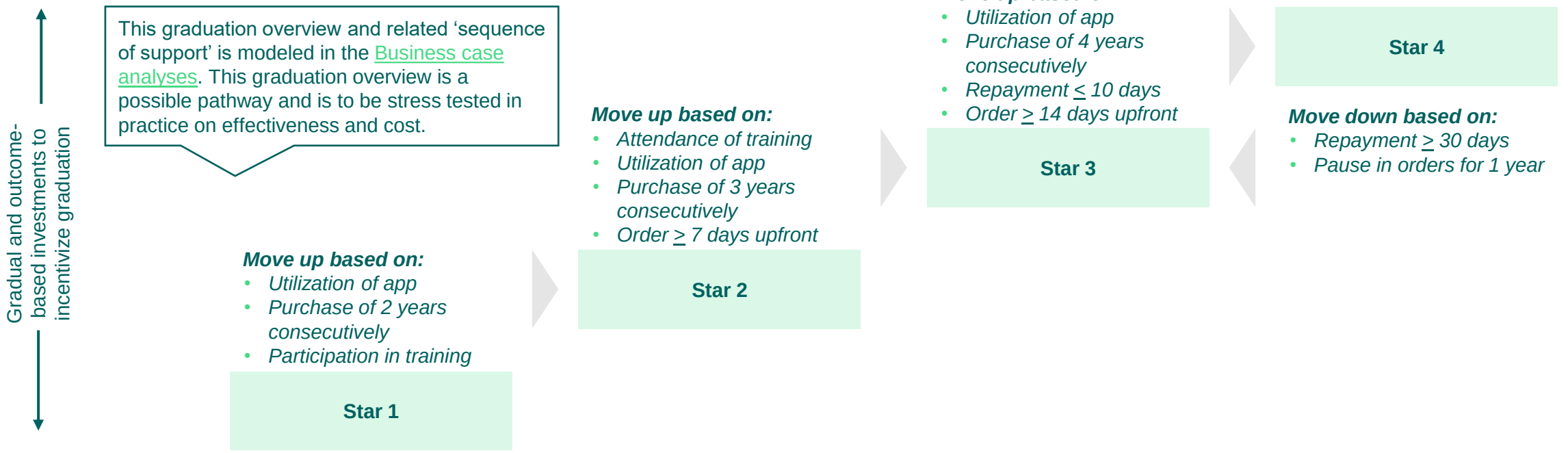
	Segment 1: Tomato (Open field)	Segment 2: Tomato (Greenhouse)	Segment 2: Cabbage (Open field)
Description	• Farmers who grow tomatoes on open land and currently access seedlings only from GP. They will receive additional services under the SDM based on a graduation model.	• Farmers who grow tomatoes in greenhouses and currently access seedlings only from GP. They will receive additional services under the SDM based on a graduation model.	• Farmers who grow cabbages on open land and access seedlings only from GP. They will receive additional services under the SDM based on a graduation model.
Challenges	• Pests and diseases • Poor post-harvest management	• Requirements for skilled technical expertise • High set-up costs • Pests and diseases	• Pests and diseases • Poor post-harvest management
Scale	Small: 0.25 acres Medium: 1.25 acres	Small: 1 greenhouses* Medium: 5 greenhouses*	Small: 0.25 acres Medium: 1.25 acres
Services received	• Access to high quality seedlings • Access to agronomic training • Access to quality organic fertilizer • Market linkages • Soil testing services • Working capital facility**	• Access to high quality seedlings • Access to agronomic training • Access to growing media • Soil testing and sterilization services • Market linkages • Working capital facility**	• Access to high quality seedlings • Access to agronomic training • Access to quality organic fertilizer • Market linkages • Soil testing services • Working capital facility**

Key characteristics	• Average yield
	  ○ SDM: 3kgs per plant
	  ○ Baseline: max 4 kgs per plant
	• Location: Eastern Kenya, Western Kenya
		• Average yield:
		  ○ SDM: 8kgs per plant
		  ○ Baseline: max 20 kgs per plant
		• Location: Eastern Kenya, Western Kenya
			• Average yield:
			  ○ SDM: 8kgs per plant
			  ○ Baseline: max 20 kgs per plant
			• Location: Western Kenya

Baseline farmer	• Farmers who grow tomatoes in the open and access seedlings only from GP.	• Farmers who grow tomatoes in the open and access seedlings only from GP.	• Farmers who grow cabbages in the open and access seedlings only from GP.

*Notes: * Each greenhouse is 240m^2 **This service is potentially to be provided to farmers based on performance*
Sources: GrowPact interviews (2022), PDC data

Farmer graduation | Farmers will receive different levels of support and training based on their loyalty to GrowPact and their success with their farming enterprises.



GrowPact Academy	Digital & Training	Digital & Training discount	Digital, Training disc & Mentoring	Digital, Training disc & Mentoring
Organic fertilizer 1)	No access	Access	Access at discount	Access at discount
Soil tests/treatment	Full price	Full price	Discounted 5%	Discounted 5%
Seedlings	Full price	Full price	Discounted 5%	Discounted 5%
***Mtumbwi* system**	Full price	Full price	Discounted 5%	Discounted 5%
Extended repayment 1)	Purchase	% Order / % Purchase	% Order / X days Purchase	% Order / Y days Purchase

Notes: 1) Due to a lack of available data, and uncertainty of related assumptions, the SDMA excludes the services of organic fertilizer and extended payment of services;
Source: GP interviews (2022)

SWOT Analysis | GrowPact's understanding of its farmer base will enable the business to establish long-term client relations to drive vegetable value chain development in Kenya.

Strengths

- Dedicated management team with a clear vision
- GrowPact has strong focus on continuous improvement (pilot first, then scale nursery operations to Embu)
- Skill for propagating a broad variety of and high-quality vegetable and other seedlings creating more impact for farmers
- Strategic location of operations to target the Western Kenya region
- Diversified product portfolio

Weaknesses

- Limited access to market information (demand) which impacts production leading to stock-outs
- GrowPact's limited service offering limits the ability to influence farmer loyalty
- High logistics costs for distant farmers due to location of operations

Opportunities

- Development of partnerships and collaborations with other businesses and organizations in the agriculture sector
- Growing demand for high quality vegetable seedlings in Kenya
- Growing demand for soilless growing substrate and organic fertilizer in Kenya

Threats

- Climate change and unpredictable weather patterns influence production of focus crops
- Competition from established players in the market
- Limited access to market information

Sources: GrowPact interviews (2022), Observations during client visit

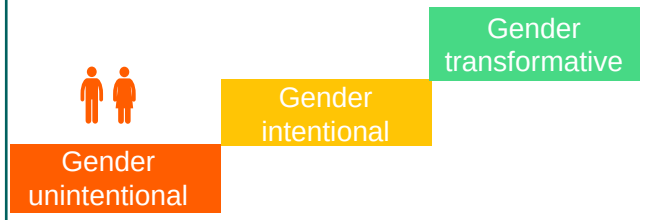
Gender assessment | To better support women within the SDM, GrowPact will need to document their gender strategy

Questions	Answer	Explanation
Gender strategy: Is gender equality a strategic goal for GP which is communicated in documents?	No	Gender is not captured in a detailed and formalized strategy. There is increasing interests from investors in the business for tracking of gender indicators and the incorporation of gender into tailored services.
Data collection: Does GP collect data on staff or customers/farmers disaggregated by gender?	No	Farm-level data is not deliberately gender-disaggregated and can thus hardly be used for analytics and reporting on gender. Staff data is gender disaggregated.
Inclusive workplace: Does GP have policies or practices to make the workplace inclusive for both women and men?	No	There is no written policy, but bi-weekly meetings are held with representatives from staff to discuss staff issues. There are plans to develop policies including HR and sexual harassment.
Inclusive consultation: Does GP speak to or consult both male and female customers (farmers) to learn about their different needs and preferences when designing a product	No	Consultations are done with farmers individually and take a gender lens. This is however narrow in scope as consultations are guided purely by demand for seedlings and do not take other services into consideration.
Inclusive tailoring: Does GP tailor services based on how needs may be different for men and women?	No	Services are tailored purely based on farmer demand for seedlings. GP aims to work towards, potentially gender-tailoring of services with the acquisition and implementation of the FMS.
Independence and control over resources: Do services enable women to improve their independence, control over resources and/or value capture?	No	Contracts are assigned with individuals rather than households and without discrimination of services by gender.

Sources: GrowPact interviews (2022), IDH Gender Tool

Recommendations | GrowPact and its farmers could benefit from directly implementing inclusive policies and services while lifting key barriers to women economic empowerment

Where is GrowPact on its gender journey?



GrowPact is gender Unintentional

The IDH partner's previously employed business model created limitations on its capacity to take a data-driven approach to understand the different needs and constraints of women and men.

The business therefore did not have sufficient data to be able to tailor services to ensure either that men and women have access to resources, control over the benefits of those resources or are working in an inclusive workplace

GrowPact could strengthen its gender strategy by:

Taking a data-driven approach to understand the different needs and constraints of women and men in its internal and external processes with the goal of ensuring that both women and men have access to resources, have similar control over the benefits of those resources and/or are working in an inclusive workplace.

Best practices to implement

Collect and analyze gender-disaggregated data for:

1. on farmers (e.g., age, socio-economic status, crops, access/control over household resources and willingness to adopt new tech), when making service delivery decisions
2. on employee recruitment, pay, promotion, skills training, and turnover and diagnose where there might be challenges and install safeguards against violence and harassment

Consult women and men about norms around movement to better understand preferences around meeting time, location or format

Investigate factors of productivity (e.g., seeds, irrigation) and market access to understand differences in income based on gender and identify actions for improvement in equalized access.

Consult women and men on needs and preferences on inputs (e.g., taste, maturation, yields of seeds)

Bundle inputs provision with training specific to known skills gaps for women and men (e.g., negotiating skills, literacy programs, agronomic training)

Sell inputs directly to both men and women customers, whether or not they are the household heads or not, and tailor timing and length of trainings on application of inputs to men's and women's existing responsibilities

Barriers to be lifted

Economic: women's access and control of resources particularly land and finance is comparatively lower than that of men.
Practical: access to high quality inputs is a challenge to most women

Benefits to GrowPact

Collecting **gender disaggregated data on farmers and inclusive consultation** leads to better **decision-making and innovation** around products and services suited to farmers

Results in enhanced **business reputation, competitiveness and performance**

Inclusive consultation can result in enhanced reputation and competitiveness

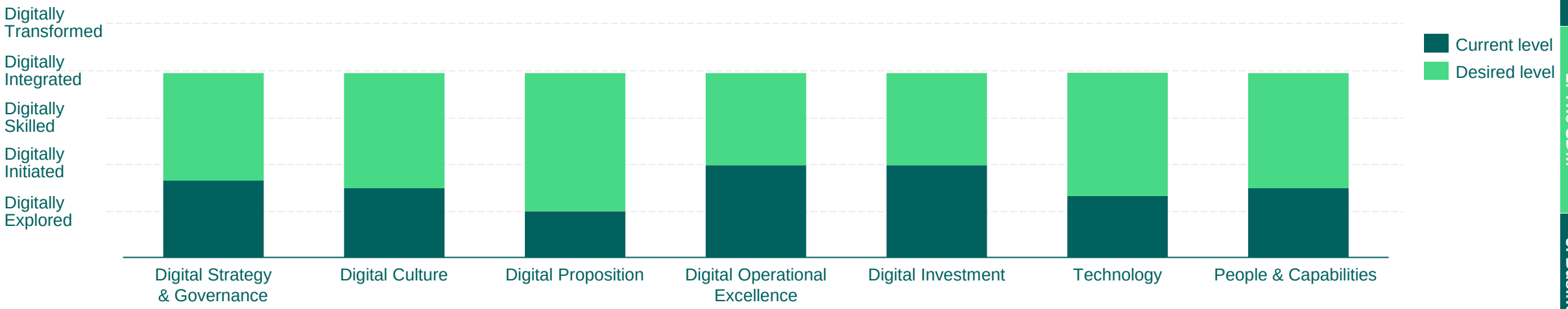
Creating a **gender strategy** and embedding this into the business can lead to improved **farmer and employee engagement and retention**

Women's financial resilience is beneficial in household and community resilience and **fosters stable market and constant supply** chains[3].

Increases the probability of attracting impact finance from investors with a gender focus

Notes: 1. Davies, M. Baars, M., (2017)., Link-up business case insights: Retrospective learnings from offering bank accounts to savings groups in Tanzania and Kenya
Source: IDH Gender tool

Digital Maturity Assessment (1/3) | GrowPact is digitally initiated and is currently focused on implementing a farmer management information system



Results

The digital maturity assessment for GrowPact shows that the organization is digitally initiated:

- Overall, the leadership acknowledges the role that digital technologies play in enhancing operational experience have several ad hoc initiatives in the planning which account for the potential impact and role of digital for the future.
- The company is in the process of sourcing for a FMIS to support nursery planning and service delivery to farmers
- GrowPact leverages the QuickBooks system for its accounting. Paper (administration) still plays a part in order processing.
- The company has, however, not embraced the role of digital in its service delivery to farmers

Recommendations

- Implement a FMIS to facilitate collection and management of farmer data to support efficient delivery of services and tailoring of services to the different farmer segments.
- Hire personnel to oversee the design and implementation of the FMIS including training/ capacity building of the relevant stakeholders.
- Ensure employees from all layers of the company are onboarded with the digital agenda (particularly on the FMIS), to avoid a lack of alignment.
- Document formal policies and rules that provide structure and guide quick decision making in the organization.
- Set aside an annual budget for digitization activities.

Digital Maturity Assessment (2/3) | Consideration of best practices will be key for the successful implementation of an FMS to profile and manage their farmers.

FMS design and implementation best practices

1. **Understand business needs:** understanding the business needs that GP envisions to solve at the onset helps in customizing the system to capture the crucial data points that need to be collected. These needs include tracking inventory, managing orders, scheduling production and tracking farmer production activities. For example, since GP intends to leverage some of the data to support production planning, it will be critical to ensure alignment with farmers on data to be collected and ensure farmers understand the need for this. Other important factors to consider includes ease of use, customization options and integration with GrowPact's existing software systems.
2. **Create ownership both at GP and farmer level:** there needs to be full support from the company's management team**.** GP should onboard a person to oversee the design and implementation of the FMS including data collection, training/ capacity building of the staff and agents.
3. **Design clear workflows/roadmap:** clearly articulate all the activities that need to be undertaken and assign responsibilities between FMS provider staff and GP staff involved with implementation.
4. **Capacity building and facilitation of staff:** Success largely depends on the ability of GP's staff to collect and verify data, maintain relationship with farmers and influence adoption and loyalty. The sales team will need to be well trained and equipped to implement the FMS. Particularly, GP should provide the its sales team with smartphones and data bundles to facilitate farmer onboarding.
5. **Gender integration:** to incorporate gender into FMS implementation, GP can a) collect gender disaggregated data and continuously assess the data to identify trends, b) encourage women participation in initial trainings and demos, and c) have women agents to cater to the needs of women farmers.
6. **Data security and consent:** involve an external expert if needed when it comes to data security (e.g., when mobile money payments are integrated) and integrate farmers consent when sharing data with 3rd parties.
7. **Clarity on costs:** Aside from the initial hardware and software costs, GP should get clarity on additional running costs such as maintenance; costs of data collection, costs for bulk SMS, training of users and additional application programming interface (API) after initial set-up to ensure these are budgeted for annually

Digital Maturity Assessment (3/3) | Understanding the business data and decision needs across the various supply chain nodes will ensure GP customises its FMS to meet those needs

	Farmer level	GrowPact level
Business needs	• Timely communicate with farmers (weather information, training tips etc.). • Track production cycles/calendar and follow up of farm activity including automated agronomy support (production calendar, input use). • Measure performance/ productivity of farmers • Track farmer attrition with an aim to increase farmer loyalty. • Leverage data to inform farmer graduation/tailor services	• Understand farmer production cycles to ensure adequate seedling supply for ad hoc demand • Timely seed propagation for farmers with advance orders • Ability to link nursery production needs to the company budgets • Ability to leverage the FMS data to facilitate access to credit for farmers who qualify • Manage loans to farmers. • Ability to create market linkages for farmers
Data points	• Farmer personal data • Production data • Farmer mobile details • Service data (Type of services received) • Farmer group details, where applicable	• Farmer advance orders • Farmer credit details (loan size, repayment period etc.) • Market information data e.g., prices
Potential risks	• Reluctance of the farmers to share their data. • Accuracy of the data provided/collected • Low levels of digital literacy and mobile phone/mobile money account ownership.	• Ability to onboard people with the right digital skills. • Lack of ownership by GP staff and potential resistance to change • Inadequate capacity building support to staff. • Limited budget dedicated to the digitization agenda. • Ensuring data security.

3

Business Case

For business sensitivity reasons, we have excluded the pages of 'GrowPact's business case' chapter from the report.

4

Impact Case

Farmer segments | GrowPact's farmer base is made up of open field and greenhouse tomato and cabbage farmers, with segments being differentiated by yield and farm size/production units.

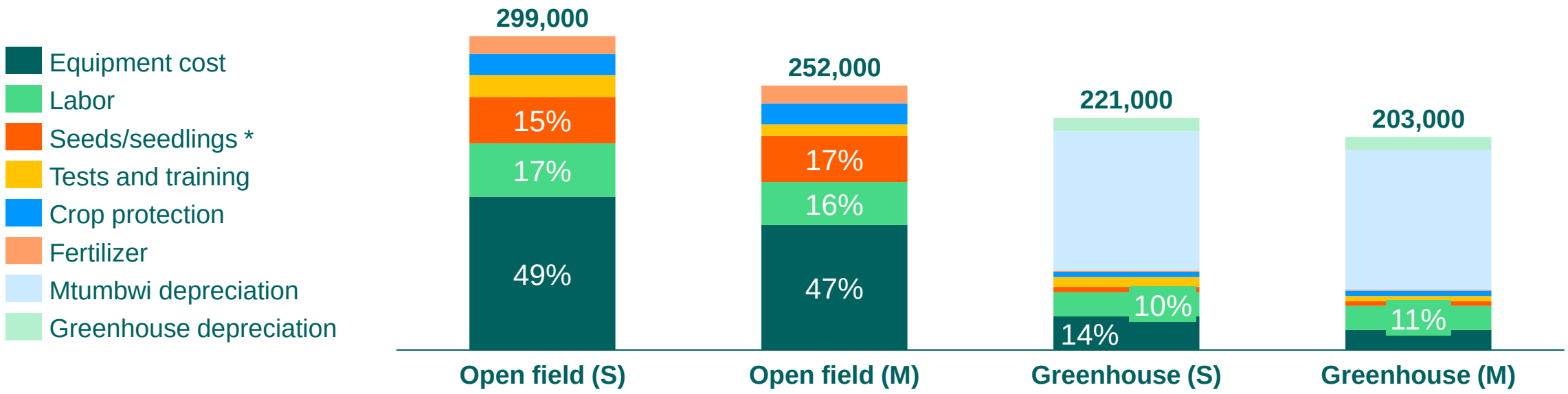
Characteristics [1]	Small scale	Medium scale	Small scale	Medium scale	Small scale	Medium scale
Focus crop	Tomato + Cab-S	Tomato + Cab-S	Tomato + Cab-S	Tomato + Cab-S	Cabbage	Cabbage
Production type	Open field	Open field	Green house	Green house	Open field	Open field
Current yield	3 kg/plant	3 kg/plant	15 kg/plant	15 kg/plant	9,800 #/acre	9,800 #/acre
Maximum yield	4 kg/plant	4 kg/plant	20 kg/plant	20 kg/plant	12,600 #/acre	12,600 #/acre
Farm size (units)	0.25 acre	1.25 acre	1 # [3]	5 # [3]	0.25 acre	1.25 acre
Farm-gate price	50 KES/kg	50 KES/kg	50 KES/kg	50 KES/kg	22 KES/#	22 KES/#
Western Kenya [3]	30%	21%	1%	1%	35%	11%
Embu [3]	35%	61%	1%	4%	-	-
	Baseline				**Baseline**	
Current yield	3 kg/plant	3 kg/plant	8 kg/plant	8 kg/plant	9,800 #/acre	9,800 #/acre
Projected yield	3 kg/plant	3 kg/plant	8 kg/plant	8 kg/plant	9,800 #/acre	9,800 #/acre

*Notes: 1) Baseline farmers indicated as sub-category in overview; 2) Estimation of segment size based on analysis from Primary Data Collection 2022. 3) Greenhouses of 240 m^2 (8m * 30m);*

Cost of production | Medium-scale farmers attain scale advantages of KES 47,000 and KES 18,000 per unit of production for open field farmers and greenhouse farmers respectively.

Cost of production (KES/cycle/acre or greenhouse)

TOMATO



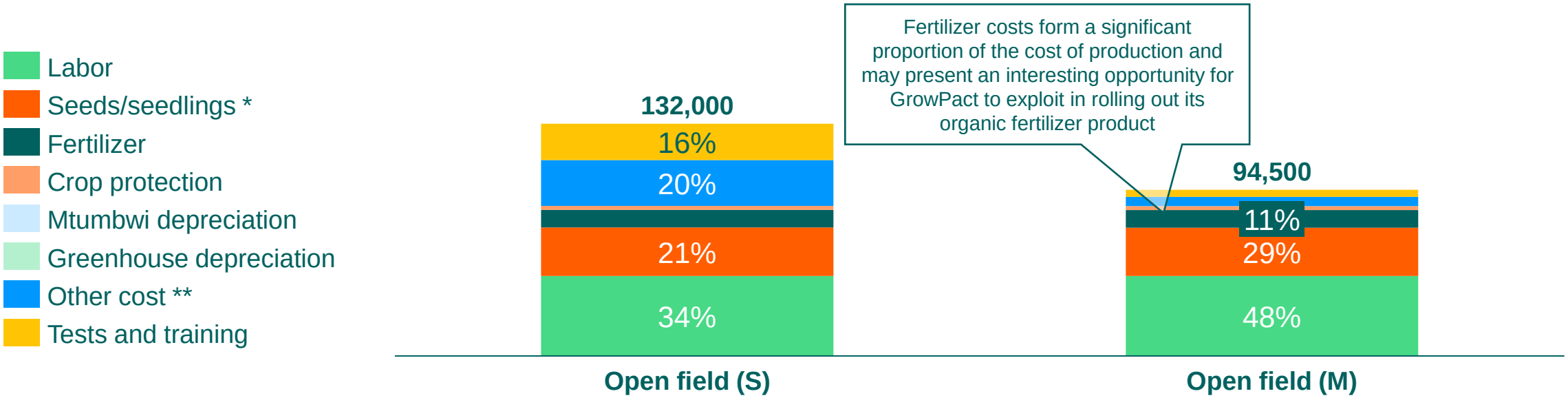
	Open field (S)	Open field (M)	Greenhouse (S)	Greenhouse (M)
USD/cycle/unit	2,450	2,050	1,800	1,700
Production units	0.25 acre	1.25 acre	1 #	5 #
Cycles/year	2	2	1	1

*Note: * Seedlings are bought from GrowPact*

Cost of production | Acquiring additional services from GrowPact, beyond high quality seedlings, puts pressure on the effectiveness of small cabbage farmers.

Cost of production (KES/cycle/acre)

CABBAGE



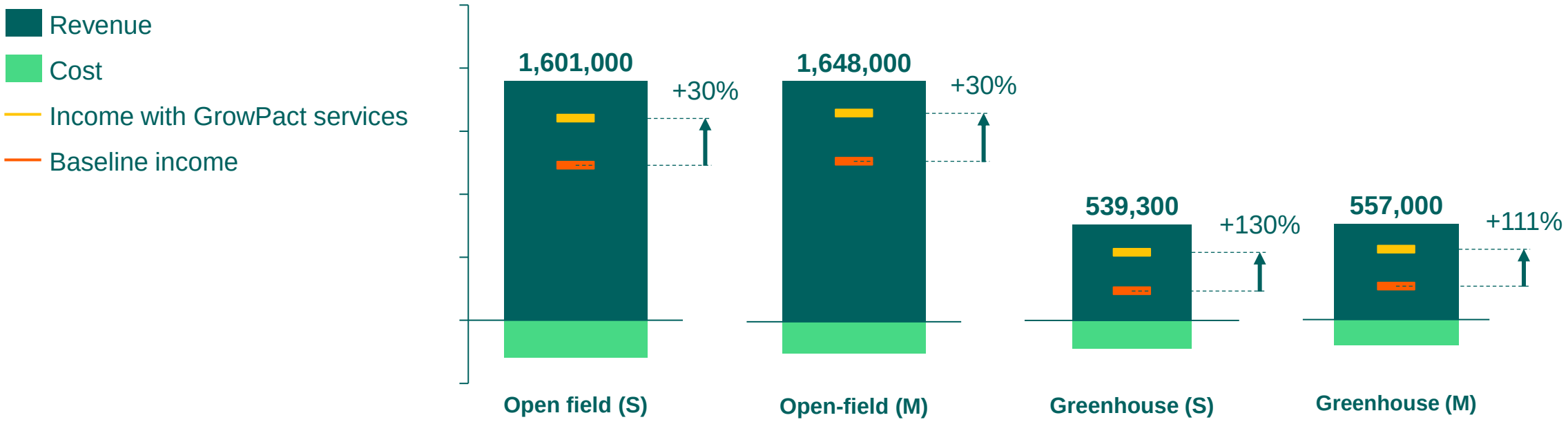
	Open field (S)	Open field (M)
USD/cycle/unit	**1,100**	**750**
Production units	**0.25 acre**	**1.25 acre**
Cycles/year	**2**	**2**

*Notes: * Seedlings are bought from GrowPact; ** Other cost consists of equipment and transportation cost;*

Profitability per acre | Open field farmers have better margins per unit of production, but this will not hold at larger scales of production due to labor limitations

Profitability (5-year average KES/cycle/acre or greenhouse)

TOMATO

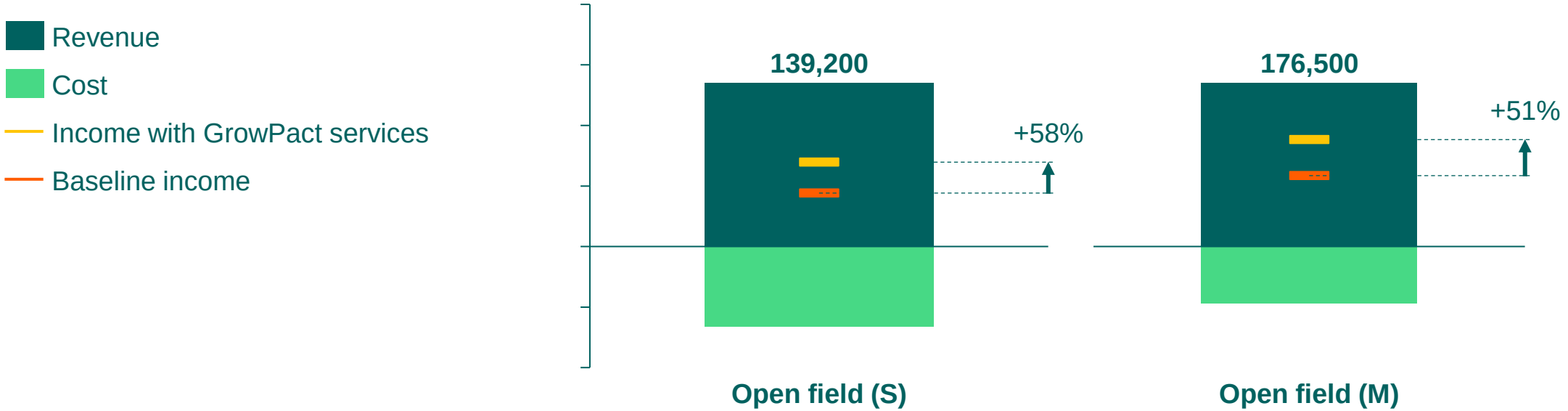


Marketable surplus per cycle	**38,000 kg/acre**	**38,000 kg/acre**	**15,200 kg/#**	**15,200 kg/#**
Production units	**0.25 acre**	**1.25 acre**	**1 #**	**5 #**
Margin (result) %	**84%**	**87%**	**71%**	**73%**

Profitability per acre | Cabbage farmers working with GrowPact outperform Baseline farmers, increasing their profitability by 58% and 51% for small and medium scale farmers respectively

Profitability (5-year average KES/cycle/acre or greenhouse)

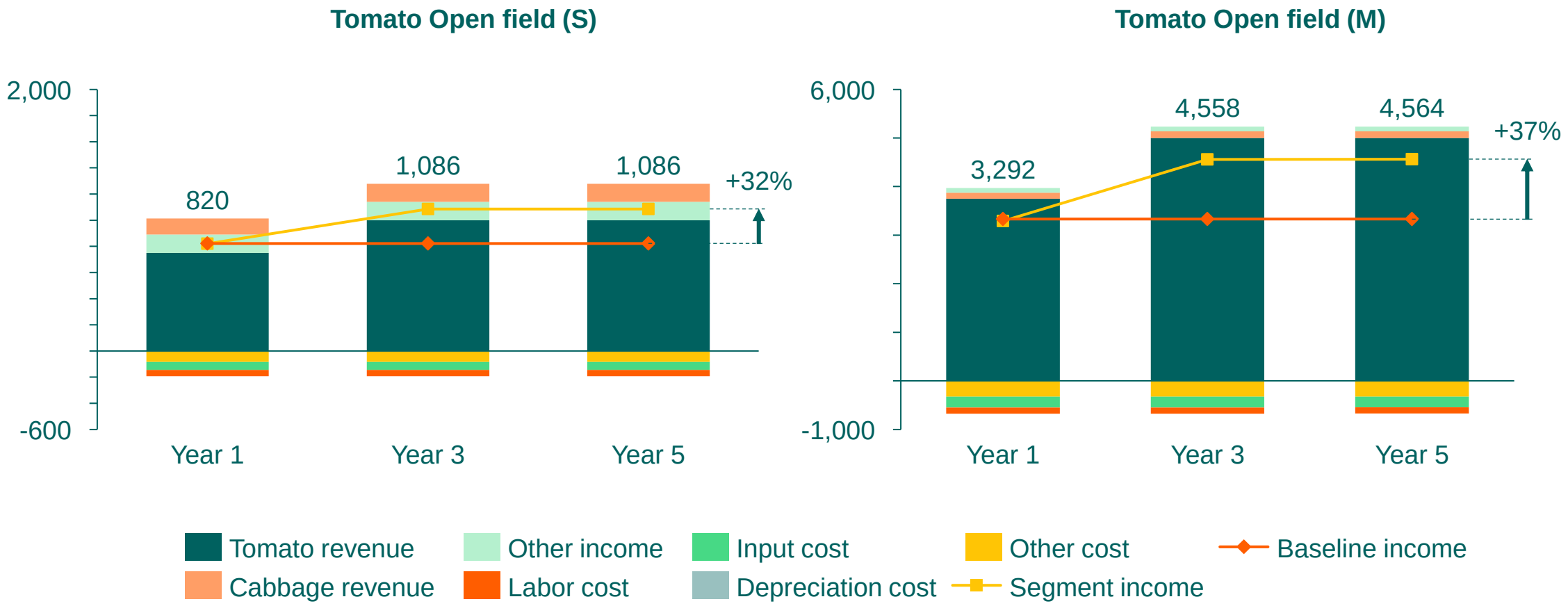
CABBAGE



Marketable surplus per cycle	**12,300 #/acre**	**12,300 #/acre**
Production units	**0.25 acre**	**1.25 acre**
Margin (result) %	**50%**	**65%**

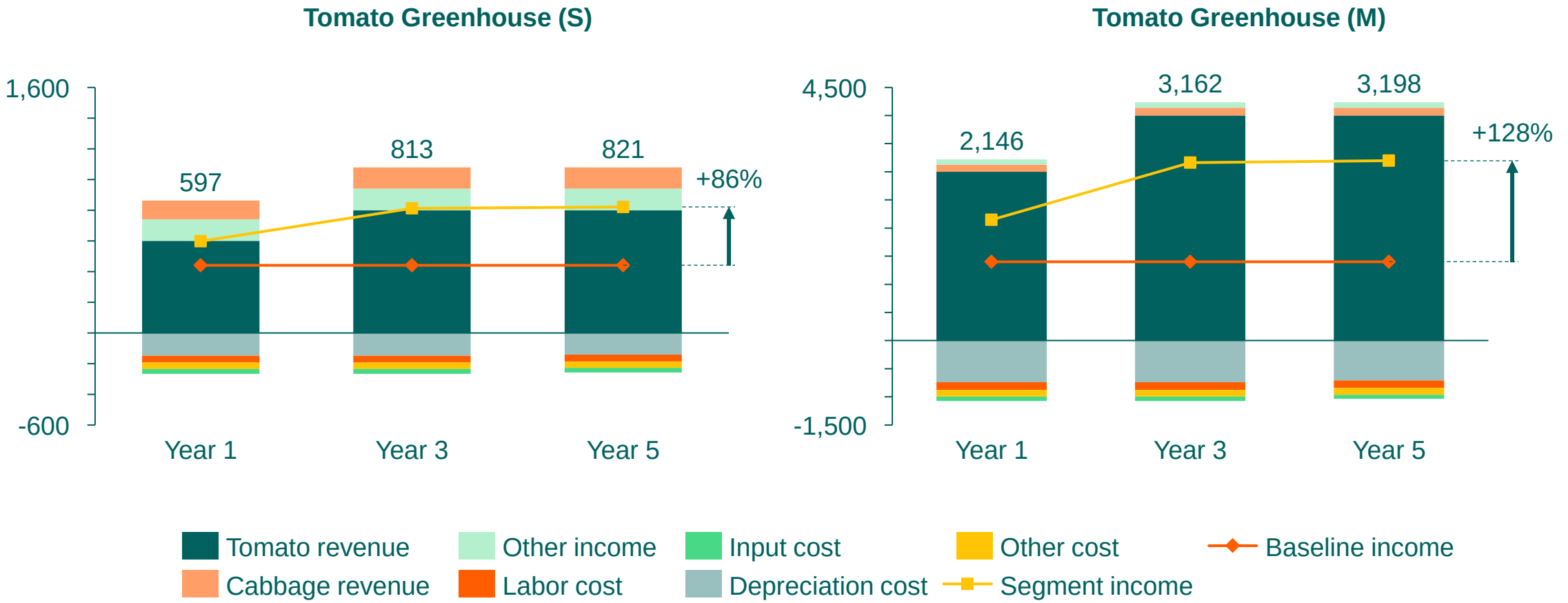
Farm P&L | Farmers receiving services from GrowPact outperform Baseline farmers in the long-run by 32% and 37% for small and medium-scale farmers respectively.

Profit and loss for a five-year period (,000 KES/year)



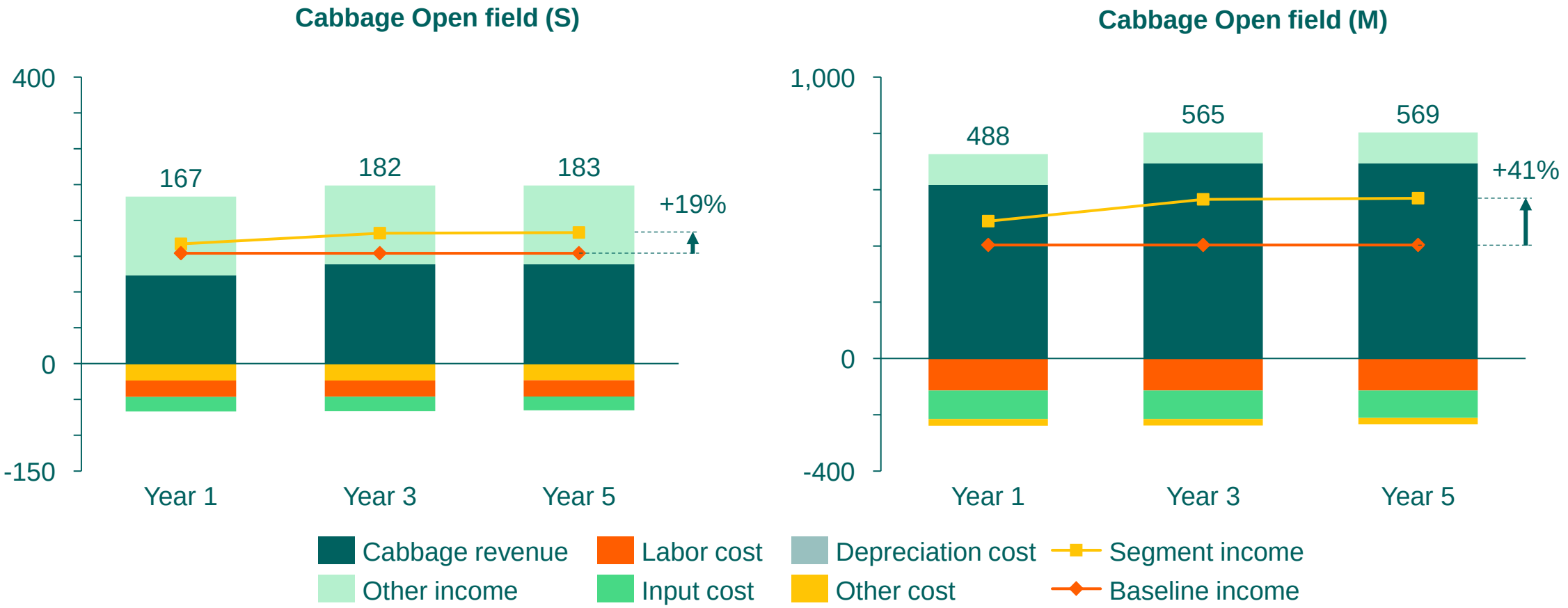
Farm P&L | Farmers working with GrowPact outperform Baseline farmers, which shows farm-level business case of investing in the *Mtumbwi* farming system and implementing GAP

Profit and loss for a five-year period (,000 KES/year)



Farm P&L | Cabbage farmers receiving services from GrowPact marginally outperform Baseline farmers which signals potential hurdles in reaching cabbage farmers with additional services.

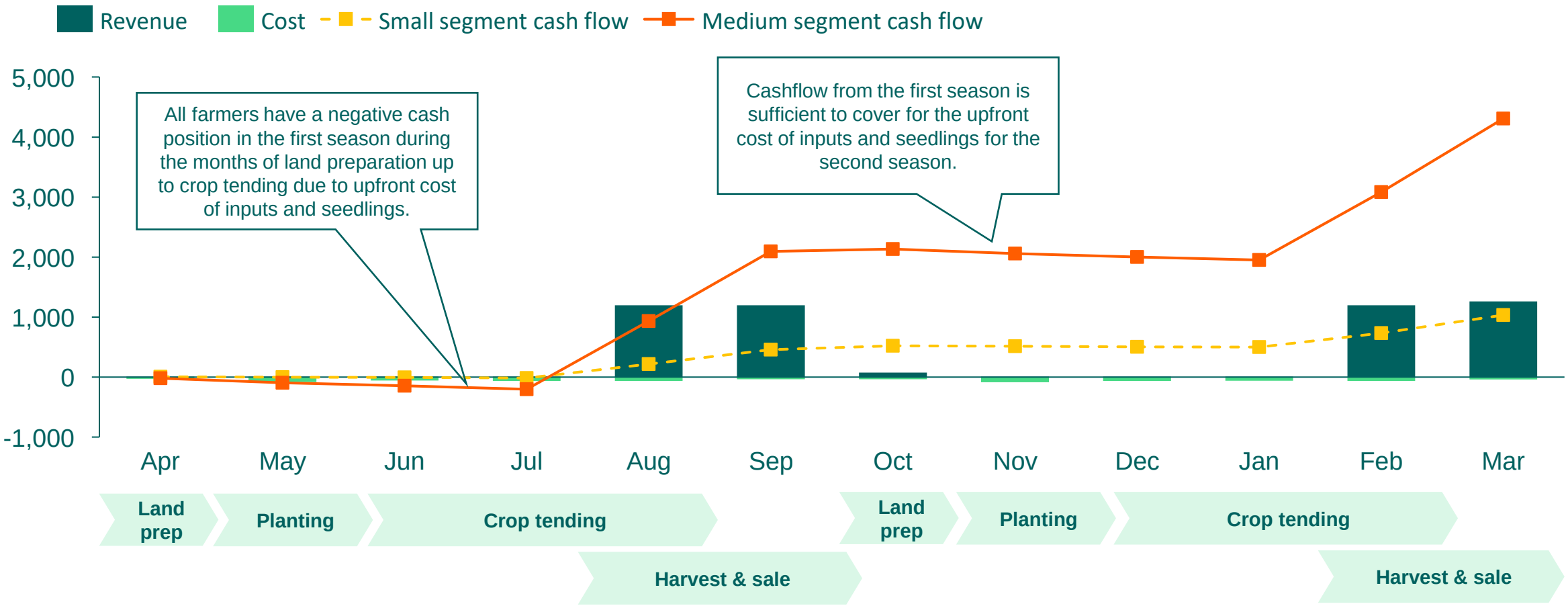
Profit and loss for a five-year period (,000 KES/year)



Monthly cash flow | Cultivating two seasons per year provides farmers with sufficient liquidity to acquire high quality seedlings and other services from GrowPact.

Cumulative net cash flow (,000 KES/month) [1) / 2)]

TOMATO – Open field

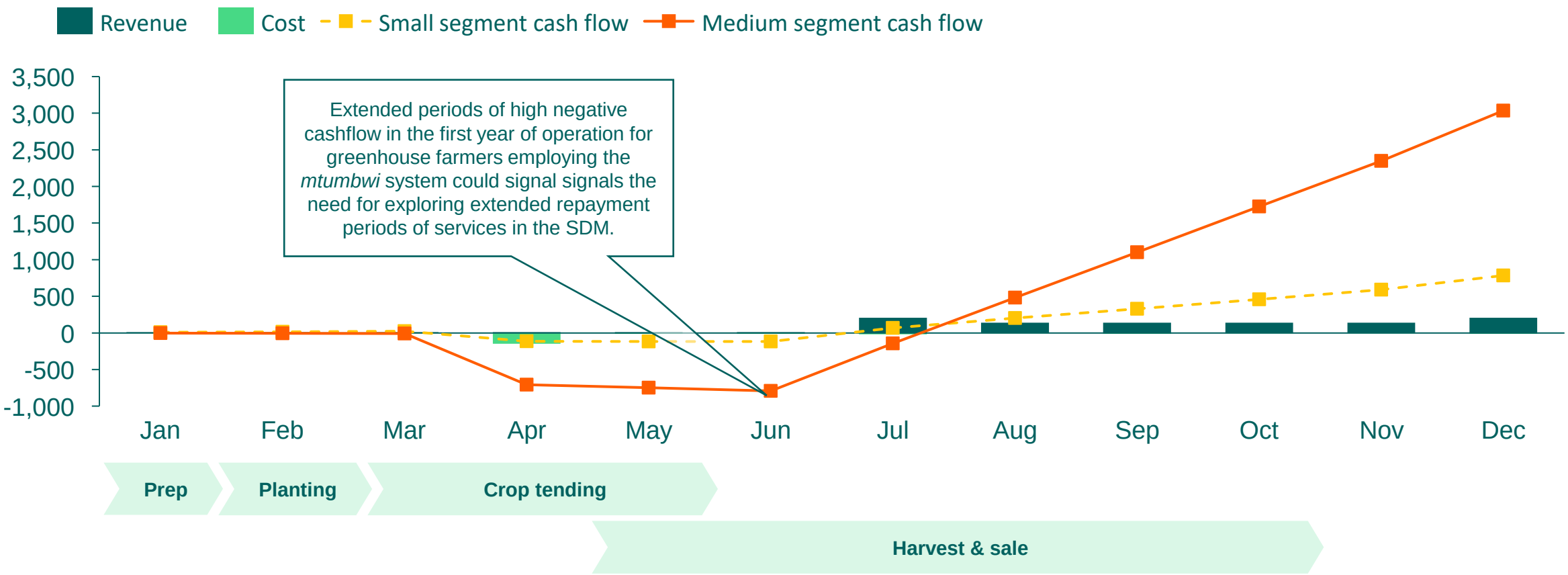


Notes: 1) Cumulative cash flow of focus crop operations excl. depreciation of greenhouses; 2) Depreciation of Mtumbwi system, which is to be depreciated over 3 years, is added to the cost of planting (February).

Monthly cash flow | Investments in the *Mtumbwi* system and skilled labor puts greenhouse farmers in a cash trapped position between April until August.

Profit and loss for a five-year period (,000 KES/year)

TOMATO – Greenhouse

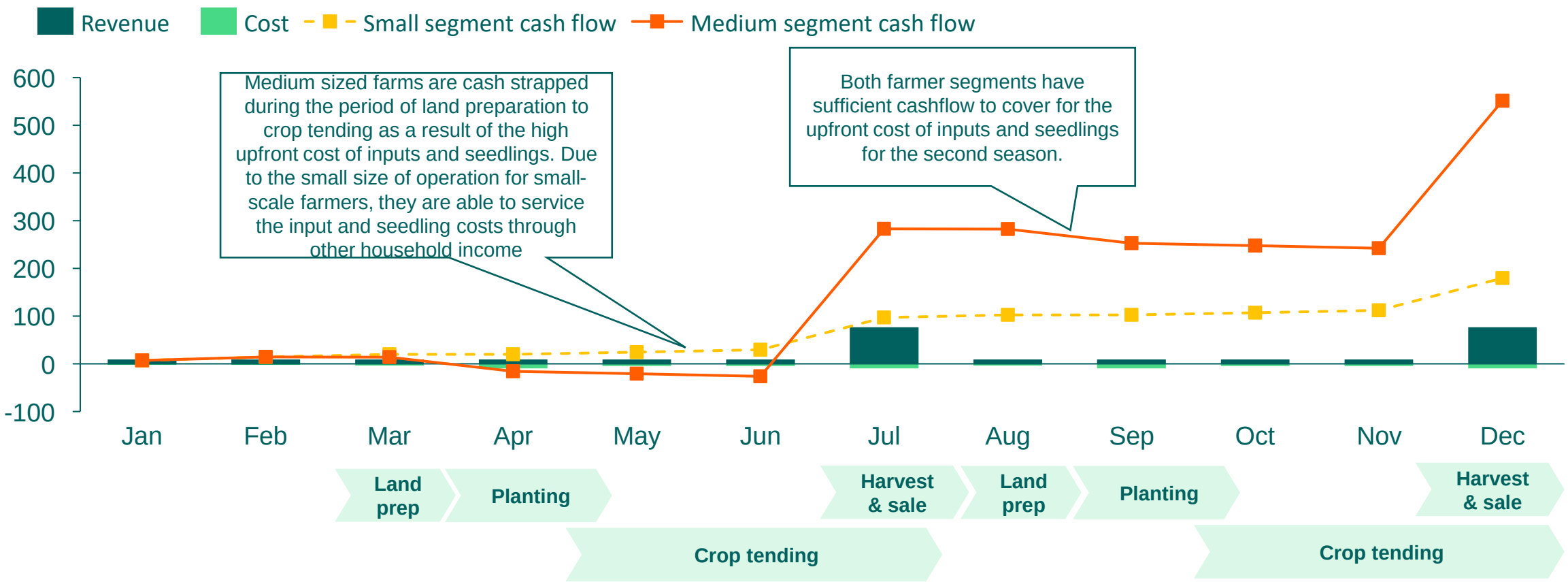


Notes: 1) Cumulative cash flow of focus crop operations excl. depreciation of greenhouses; 2) Depreciation of Mtwumbwi system, which is to be depreciated over 3 years, is added to the cost of planting (February).

Monthly cash flow | Smallholder cabbage farmers have sufficient liquidity to maintain a positive cash flow through out the year due to earning sufficient diversified income

Profit and loss for a five-year period (,000 KES/year)

CABBAGE

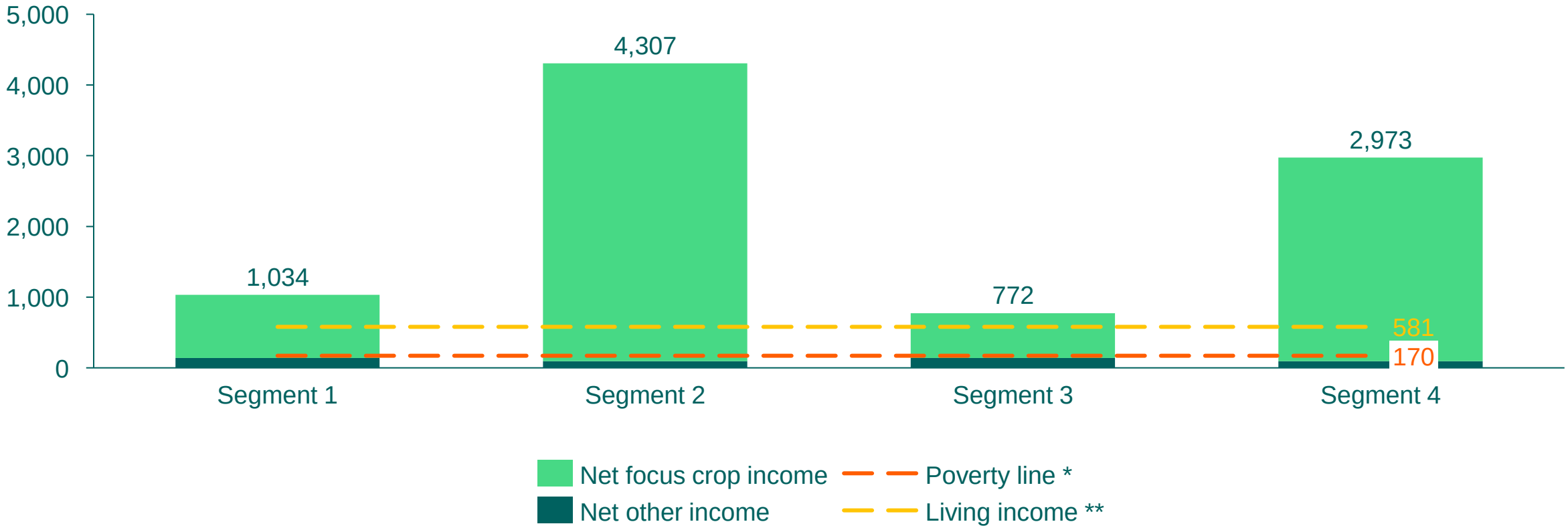


Notes: 1) Cumulative cash flow of focus crop operations excl. depreciation of greenhouses; 2) Depreciation of Mtwumbwi system, which is to be depreciated over 3 years, is added to the cost of planting (February).

Living income | Tomato farmers in each segment earn an income above the living income benchmark indicating the potential of GrowPact to work with tomato farmers to increase production

Household income, living income, poverty line (,000 KES/year)

TOMATO

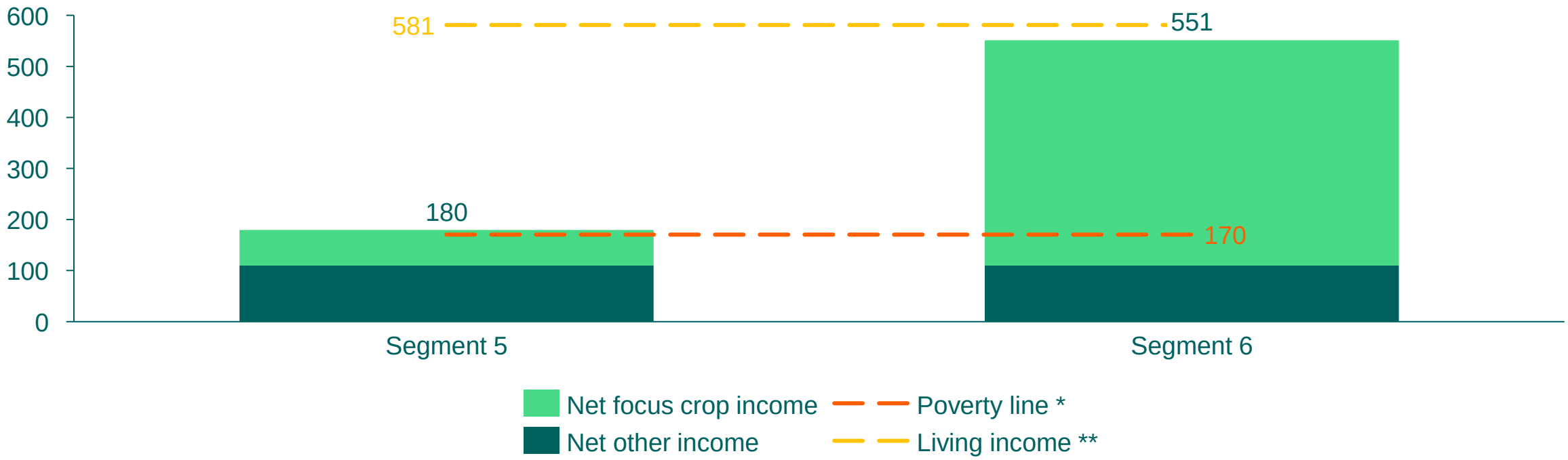


*Notes: * The World Bank poverty line was adjusted to a household of 7 members and a PPP conversion factor of XXX LCU per USD. Further assumptions can be found in the annex*
*** The living income benchmark is based on a family composition of 2 adults and 5.7 children with 1.7 FTE. Further assumptions can be found in the annex*

Living income | Small-scale farmers cultivating cabbage as a focus crop earn an income just above the poverty line, signaling the need to diversify towards higher value crops such as tomato.

Household income, living income, poverty line (,000 KES/year)

CABBAGE



*Notes: *The World Bank poverty line was adjusted to a household of 7 members and a PPP conversion factor of XXX LCU per USD. Further assumptions can be found in the annex*
*** The living income benchmark is based on a family composition of 2 adults and 5.7 children with 1.7 FTE. Further assumptions can be found in the annex*

Sensitivity analysis | The high value of tomatoes enables open field tomato farmers to increase their income through feasible changes in land-size and potentially yield and sales prices.

The tables below shows the relative change that is needed (all else equal) for the small-scale open field tomato farmer and each of the income drivers* to increase farmer incomes by 1,000 USD/year. With a current (5-year) average annual income of USD 8,400, an income of USD 9,400 is targeted.

Feasible | Neutral | Unfeasible

TOMATO only – Open field

Income driver	Current value	Required value	% change	Comment
Farm size (acre)	0.25 acre	0.30 acre	**+15%**	An increase of 0.04 acre seems possible for tomato cultivating farmers, as the PDC has shown that farmers have between 1.0 – 3.0 acres of farmland on average. It is important however to acknowledge that this calculation is excluded the opportunity cost when substituting a piece of cultivated land with a tomato, which might influence the outcome of this income driver.
Yield (kg/acre/cycle)	38,000	41,000	**+10%**	To achieve an increase of 3,000 kg/acre/cycle, farmers should achieve a feasible yield per tomato plant of a total of 4.2 kg/plant/cycle (current assumption 4.0 kg/plant/cycle). This productivity is only to be achieved with the implementation of GAP and advanced pest control.
Farm-gate price (USD/kg)	0.41	0.46	**+15%**	Tomato sales prices fluctuate throughout the year and are different per sales channel. If GrowPact can enable market access through the right channel, the increase of 0.05 USD/kg (6.47 KES/kg) may be feasible during periods of low supply.
Cost of production (USD/cycle)	610	110	**-/- 80%**	Cultivating two cycles per year, farmers require a production cost decrease of 110 USD/cycle, which may not be feasible in light of the target to utilize high quality inputs and implement GAP.
Other income (USD/year)	1,140	2,140	**+90%**	Further research is required to evaluate the extent to which farmers are able to diversify their income within the limits of capital, labour, and land.

*Note: * The different income drivers influence the farm income through the following simplified formula:* $Total\ household\ income = Farm\ size \times Yield \times Price - Cost\ of\ production + Other\ income$

Sensitivity analysis | The high commercial value of tomatoes enables tomato cultivating farmers to increase their income through feasible changes in land-size and potentially sales prices.

The tables below shows the relative change that is needed (all else equal) for the small-scale greenhouse tomato farmer and each of the income drivers* to increase farmer incomes by 1,000 USD/year. With a current (5-year) average annual income of USD 6,200, an income of USD 7,200 is targeted.

Feasible | Neutral | Unfeasible

TOMATO only – Greenhouse

Income driver	Current value	Required value	% change	Comment
Farm size (greenhouses)	1	1.23	**+25%**	Adding an additional greenhouse requires an investment of approx. 2,050 USD (250,000 KES), which seems feasible based on the projected income earned by greenhouse farmers.
Yield (kg/GH/year)	15,200	18,700	**+25%**	Increasing yields does not seem feasible under current conditions. Farmers currently are projected to yield 20 kg/plant/cycle from the *Mtumbwi* system, due to an increased length of the harvest period. Further increasing the yield per plant, as density per greenhouse is not possible.
Farm-gate price (USD/kg)	0.41	0.47	**+15%**	Tomato sales prices fluctuate throughout the year and are different per sales channel. While GrowPact can enable market access through the right channel, the increase of 0.07 USD/kg (8.1 KES/kg) may only be feasible during low supply periods.
Cost of production (USD/cycle)	1,800	800	**-/- 60%**	Cultivating one cycles per year, farmers require a production cost decrease of 894 USD/cycle, which may not be feasible in light of the target to utilize high quality inputs and implement GAP.
Other income (USD/year)	1,150	2,150	**+90%**	Further research is required to evaluate the extent to which farmers are able to diversify their income within the limits of capital, labour, and land.

*Note: * The different income drivers influence the farm income through the following simplified formula:* $Total\ household\ income = Farm\ size \times Yield \times Price - Cost\ of\ production + Other\ income$

Sensitivity analysis | The low commercial value of cabbages hinders small scale farmers from significantly increasing and change their income by investing in their cabbage operations.

The tables below shows the relative change that is needed (all else equal) for the small-scale and medium scale open field cabbage farmer and each of the income drivers* to increase farmer incomes by 1,000 USD/year. With a current (5-year) average annual income ranging USD 1.5k – 4.5k, an income ranging between USD 2.5k – 5.5k is targeted.

Feasible | Neutral | Unfeasible

CABBAGE only

Income driver	Small scale		Medium scale		Comment
	Current	Required	Current	Required	
Farm size (acre)	0.25	0.70 *(+180%)*	1.25	1.60 *(+30%)*	PDC data shows that cabbage farmers have between 0.5 - 2.5 acres of total farmland. Increasing land dedicated to cabbage to the required value is feasible for medium scale farmers but may not be feasible for the smaller scale farmer in the short-run
Yield (#/acre/cycle)	12,300	23,300 *(+90%)*	12,300	21,000 *(+70%)*	Currently farmers are assumed to sow at a density of 14,000 per acre with a success rate of approx. 80%, which is the optimum sowing density. Therefore, increasing the success rate will not enable the farmers to increase their productivity to the required value.
Farm-gate price (USD/#)	0.18	0.34 *(+90%)*	0.18	0.03 *(+20%)*	Cabbages are a lower value vegetable and even when considering price fluctuations due to over/under supply, the required sales price for the smallholder farmer may not be feasible. Medium scale farmers may be able to attract the price increase required to increase their incomes by USD 1,000
Cost of production (USD/cycle)	270	N/A	970	470 *(-/-50%)*	Cultivating one cycles per year, medium-scale farmers require a production cost decrease of 500 USD/cycle, which is not feasible considering the target to utilize high quality inputs and implement GAP.
Other income (USD/year)	895	1,895 *(+110%)*	895	1,895 *(+110%)*	Further research is required to evaluate the extent to which farmers are able to diversify their income within the limits of capital, labour, and land.

*Note: * The different income drivers influence the farm income through the following simplified formula:* $Total\ household\ income = Farm\ size \times Yield \times Price - Cost\ of\ production + Other\ income$

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transforming markets

IDH Annual Report 2021

This report was created using think-cell

Thanks

IDH would like to express its sincere thanks to GrowPact for their openness and willingness to partner through this study. By providing insight into their model and critical feedback on our approach, GrowPact is helping to pave the way for service delivery that is beneficial and sustainable for farmers and providers

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GrowPact

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5

Annex

Abbreviations

Abbreviation	Meaning
EBIT	Earnings Before Interest & Tax
FMIS	Farmer Management Information System
FPEAK	Fresh Produce Exporters Association of Kenya
HCD	Horticultural Crops Directorate
KEPHIS	Kenya Plant Health Inspectorate Service
KES	Kenyan shilling (currency)
PHL	Post Harvest Losses
MT	Metric ton (1,000 kg)
P&L	Profit and loss statement
PCPB	Pest Control Products Board
SDM	Service delivery model
SHF	Smallholder farmer
SWOT	Strengths, weaknesses, opportunities and threats
OPVs	Open Pollinated Varieties
USD	United States dollar (currency)
UAE	United Arab Emirates

Farmer assumptions (1/7)

1. GENERAL INFORMATION

Segment distribution		Other PDC Analysis	EMBU PDC Analysis	Other Aggregate	EMBU Aggregate
Segment 1	%/farmers	29%	33%	30%	35%
Segment 2	%/farmers	21%	57%	21%	61%
Segment 3	%/farmers	1%	1%	1%	1%
Segment 4	%/farmers	1%	4%	1%	4%
Segment 5	%/farmers	35%	0%	35%	0%
Segment 6	%/farmers	11%	0%	11%	0%
				100%	*100%*

Attrition rate		
Attrition	%/farmers	10%
Loyalty (continue buying from Growpact)	%/farmers	90%

Farmer assumptions (2/7)

		TOMATO								CABBAGE			
		OPEN FIELD				GREEN HOUSE				OPEN FIELD			
		SMALL		MEDIUM		SMALL		MEDIUM		SMALL		MEDIUM	
		BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM
Indicator/data point	**Unit**												
Includes performance of other segment													
Select	Select	CABBAGE_OPEN FIELD_SMALL_BASELINE	CABBAGE_OPEN FIELD_SMALL_SDM	CABBAGE_OPEN FIELD_SMALL_BASELINE	CABBAGE_OPEN FIELD_SMALL_SDM	CABBAGE_OPEN FIELD_SMALL_BASELINE	CABBAGE_OPEN FIELD_SMALL_SDM	CABBAGE_OPEN FIELD_SMALL_BASELINE	CABBAGE_OPEN FIELD_SMALL_SDM	NONE	NONE	NONE	NONE
Production area													
Open field	#/acres	0.25	0.25	1.25	1.25	0.0	0.0	0.0	0.0	0.25	0.25	1.25	1.25
Green house	#/green houses *(240m2)*	0.00	0.00	0.00	0.00	1.0	1.0	5.0	5.0	0.00	0.00	0.00	0.00
Production cycle													
Number of cycles per year	Cycles/year	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0
Cycle length	Months/cycle	4.0	4.0	4.0	4.0	6.0	6.0	6.0	6.0	3.0	3.0	3.0	3.0

Farmer assumptions (3/7)

				TOMATO								CABBAGE			
				OPEN FIELD				GREEN HOUSE				OPEN FIELD			
				SMALL		MEDIUM		SMALL		MEDIUM		SMALL		MEDIUM	
				BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM
Productivity															
Tomato yield															
Year 1	kg/plant/cycle			3.0	3.0	3.0	3.0	8.0	15.0	8.0	15.0				
Year 2	kg/plant/cycle			3.0	4.0	3.0	4.0	8.0	20.0	8.0	20.0				
Year 3	kg/plant/cycle			3.0	4.0	3.0	4.0	8.0	20.0	8.0	20.0				
Year 4	kg/plant/cycle			3.0	4.0	3.0	4.0	8.0	20.0	8.0	20.0				
Year 5	kg/plant/cycle			3.0	4.0	3.0	4.0	8.0	20.0	8.0	20.0				
Success rate cabbage															
Year 1	%/seedlings planted											70%	80%	70%	80%
Year 2	%/seedlings planted											70%	90%	70%	90%
Year 3	%/seedlings planted											70%	90%	70%	90%
Year 4	%/seedlings planted											70%	90%	70%	90%
Year 5	%/seedlings planted											70%	90%	70%	90%
HH consumption															
Proportion of HH consumption	kg/year			50	50	50	50	50	50	50	50	50	50	50	50
Sales channels		KES/unit	USD/unit												
General sales prices - Tomato	KES/sales unit	50	0.41	50	50	50	50	50	50	50	50	50	50	50	50
General sales prices - Cabbage	KES/sales unit	22	0.18	22	22	22	22	22	22	22	22	20	22	20	22
Other income															
Other crop income	KES/year			25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	30,000	30,000	30,000	30,000
Livestock income	KES/year			15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Off farm labour income	KES/year			85,000	85,000	40,000	40,000	85,000	85,000	40,000	40,000	50,000	50,000	50,000	50,000
Off farm non-labour income	KES/year			15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000

Farmer assumptions (4/7)

			TOMATO								CABBAGE			
			OPEN FIELD				GREEN HOUSE				OPEN FIELD			
			SMALL		MEDIUM		SMALL		MEDIUM		SMALL		MEDIUM	
			BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM
2. EXPENSES														
2.1.1 Labor - Tomato - Green house														
Activities		**KES/Manday**												
Nursery costs	#/year	300					2.0	0.0	10.0	0.0				
Land preparation	#/year	300					1.0	0.0	5.0	0.0				
Bed preparation	#/year	300					1.0	0.0	5.0	0.0				
Transplanting	#/year	300					1.0	1.0	5.0	5.0				
Top dressing	#/year	300					7.0	7.0	35.0	35.0				
Spraying	#/year	300					21.0	21.0	105.0	105.0				
Weeding	#/year	300					2.0	0.0	10.0	0.0				
Pruning, Staking & Trailing	#/year	300					26.0	26.0	130.0	130.0				
Harvesting and grading	#/year	300					20.0	20.0	100.0	100.0				
2.1.2 Labor - Tomato - Open field														
Activities		**KES/Manday**												
Nursery costs	#/year	300	4.0		4.0									
Land preparation	#/year	300	1.0	1.0	5.0	5.0								
Bed preparation	#/year	300	1.0	1.0	5.0	5.0								
Transplanting	#/year	300	0.5	0.5	2.5	2.5								
Top dressing	#/year	300	1.5	1.5	7.5	7.5								
Weeding	#/year	300	6.0	6.0	30.0	30.0								
Chemical spraying	#/year	300	12.0	12.0	60.0	60.0								
Staking & Trailing	#/year	300	2.0	2.0	10.0	10.0								
Watering	#/year	300	16.0	16.0	80.0	80.0								
Harvesting & packing	#/year	300	12.0	12.0	60.0	60.0								
Irrigation	#/year	500	20.0	20.0	50.0	50.0								

Farmer assumptions (5/7)

					TOMATO								CABBAGE			
					OPEN FIELD				GREEN HOUSE				OPEN FIELD			
					SMALL		MEDIUM		SMALL		MEDIUM		SMALL		MEDIUM	
					BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM
2.1.3 Labor - Cabbage																
Activities			KES/													
Nursery costs	#/year		300	/manday									1.0	0	5.0	0
Ploughing and furrow making	#/year		6,000	/manday									0.5	0.5	2.5	2.5
Transplanting	#/year		2,100	/manday									0.5	0.5	2.5	2.5
1st Weeding & top dressing	#/year		3,000	/manday									0.5	0.5	2.5	2.5
2nd Weeding	#/year		3,000	/manday									0.5	0.5	2.5	2.5
Chemical application	#/year		1,800	/manday									0.5	0.5	2.5	2.5
Harvesting, Sorting and Grading	#/year		2	/head									4,900.0	4,900.0	24,500.0	24,500.0
Irrigation	#/year		500	/manday									10.0	10.0	50.0	50.0
2.2 Inputs																
Input cost		**KES/unit**														
Seeds/Seedlings		**Other**	**GrowPact**													
Tomato seedling (OF)	#/units/year	3.0	Proprietary information	/ Seedling	20%	5,000	5,000	25,000	25,000							
Tomato seed (OF)	#/units/year	0.5		/ Seed	20%	5,000	5,000	25,000	25,000							
Tomato seedling (GH)	#/units/year	3.0		/ Seedling	10%					800	800	4,000	4,000			
Tomato seed (GH)	#/units/year	8.4		/ Seed	10%					800	800	4,000	4,000			
Cabbage seedling	#/units/year	0.9		/ Seedling	20%									7,000	7,000	35,000	35,000
Cabbage seed	#/units/year	0.1		/ Seed	20%									7,000	7,000	35,000	35,000
Mtumbwi (GH) – R-husk	#/units/year	4.2		/ M2						0	240	0	1,200				
Year 1	% of price					100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Year 2	% of price					100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Year 3	% of price					100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Year 4	% of price					100%	95%	100%	95%	100%	95%	100%	95%	100%	95%	100%	95%
Year 5	% of price					100%	95%	100%	95%	100%	95%	100%	95%	100%	95%	100%	95%

Farmer assumptions (6/7)

				TOMATO								CABBAGE			
				OPEN FIELD				GREEN HOUSE				OPEN FIELD			
				SMALL		MEDIUM		SMALL		MEDIUM		SMALL		MEDIUM	
				BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM
Fertilizer															
D.A.P	#/units/year	110	/Kgs	25	25	125	125	3	3	15	15	25	25	125	125
C.A.N	#/units/year	90	/Kgs	25	25	125	125	6	6	30	30	25	25	125	125
Micro nutrient (foliar) fertilizer	#/units/year	1,800	/Litre	2	2	10	10	0	0	1	1	0	0	0	0
Manure	#/units/year	2,000	/Mt	0	0	0	0	1	0	3	0	0	0	0	0
Crop protection															
Fungicides	#/units/year	900		9	9	43	43	2	2	10	10	0	0	0	0
Pesticides	#/units/year	7,500		0	0	2	2	0	0	0	0	0	0	1	1
Bio control products	#/units/year	3,000		0	0	0	0	1	1	5	5	0	0	0	0

2.3 Production facility/Equipment

Equipment types		**Cabbage**	**T-Small**	**T-Mediu**												
Non mechanic equipment	#/farm	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Mechanic equipment	#/farm	5,500	8,000	16,000	8,000	8,000	16,000	16,000	8,000	8,000	16,000	16,000	5,500	5,500	5,500	5,500
Other equipment	#/farm	5,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	5,000	5,000	5,000	5,000
		KES/unit	**Years**	**Depr.**												
Trailing ropes	#/farm	6,800	0.5	13,600	4	4	20	20	1	1	5	5	0	0	0	0
Production facilities		**KES/unit**	**Lifespan (yrs)**	**Depreciation**												
Green house	#/farm	250,000	20.0	12,500					1	1	5	5				
Mtumbwi system	#/farm	Proprietary information							0.0	240	0.0	1,200				
Year 1	% of price								100%	100%	100%	100%				
Year 2	% of price								100%	100%	100%	100%				
Year 3	% of price								100%	100%	100%	100%				
Year 4	% of price								100%	95%	100%	95%				
Year 5	% of price								100%	95%	100%	95%				

Farmer assumptions (7/7)

			TOMATO								CABBAGE			
			OPEN FIELD				GREEN HOUSE				OPEN FIELD			
			SMALL		MEDIUM		SMALL		MEDIUM		SMALL		MEDIUM	
			BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM	BASELINE	SDM
4. MONTHLY ACTIVITIES OVERVIEW														
Cashflow selection														
Type of flow	Select		Open field	Open field	Open field	Open field	Green house	Green house	Green house	Green house	Open field	Open field	Open field	Open field
TOMATO - Open field		**Month**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
Land preparation	%/activity		50%						50%					
Planting	%/activity			50%						50%				
Cultivating	%/activity				17%	17%	17%				17%	17%	17%	
Harvesting	%/activity						25%	25%					25%	25%
Marketing	%/activity						25%	25%					25%	25%
Other activities	%/activity		8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
TOMATO - Green house		**Month**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Land preparation	%/activity				100%									
Planting	%/activity					100%								
Cultivating	%/activity						33%	33%	33%					
Harvesting	%/activity								17%	17%	17%	17%	17%	17%
Marketing	%/activity								17%	17%	17%	17%	17%	17%
Other activities	%/activity		8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
CABBAGE		**Month**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Land preparation	%/activity				50%					50%				
Planting	%/activity					50%					50%			
Cultivating	%/activity						17%	17%	17%			17%	17%	17%
Harvesting	%/activity								50%					50%
Marketing	%/activity								50%					50%
Other activities	%/activity		8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%

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.

Digital Transformation Assessment methodology

The Digital Transformation Assessment identifies and prioritizes digital opportunities (tech use-cases) that fit an agri-service provider's needs, with ROI estimates. Additionally, through a digital maturity analysis, areas of improvement are suggested for the agri-service provider. Based on the assessment, the tool allows you to match-make with relevant tech-providers.

Identify digital gaps

Identifying and prioritizing the tech uses cases that are best-fit for your business

Expert network

We match-make through a database of tech providers and agri-specialists in your country

Efficient and cost-effective

An affordable, simplified process, supported by our experienced team.

Intuitive, web-based platform

Web-based platform powered by a dynamic global database of 300+ tech providers

The DTA process

1. **Introduction with the organization:** Discuss the overall process
2. **Identification:** Performing the first step of the methodology in the online DTA on the use case database
3. **Prioritization:** Prioritize the earlier identified use cases from the database based on desirability and feasibility
4. **Digital Maturity Assessment:** Conduct the Digital Maturity Assessment to distinguish strengths and opportunities for improvement
5. **Results:** The results include identified and prioritized use cases and DMA analysis with improvement areas

LI definitions

Living Income

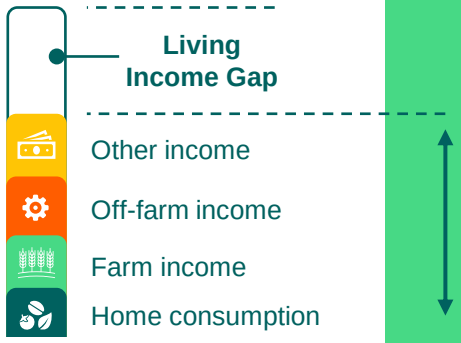
Earning a living income means that all income sources from a farming household are sufficient to afford a basic but decent cost of living for a family

Living Income Benchmark

The Living Income Benchmark is equivalent to the cost of decent living for a family

Cost of a decent standard of living for a family
(specific to a time and place)

Living Income Gap



Actual income

To measure the Living Income Gap, **compare the living income benchmark with farmers' actual income** (earned by **all adult household members** from their own farming enterprise, as well as all other income sources).

Next steps

Once gaps are identified, you can take action through a smart-mix of solutions that include: delivering bundled services to farmers, adopting better procurement practices, collaborating with and beyond your trade partners, innovating through brand and consumer engagement, and embracing transparency