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AGRI-CONNECT

Ikanga

SDM Case Report

AGRICON BORESHA CHAI

CEFA The seed of solidarity

TEA RESEARCH INSTITUTE OF TANZANIA

idh the sustainable trade initiative

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Introduction of IDH and the SDM analysis

Importance of Service Delivery

Agriculture, including forestry, 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 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 (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 Farmfit analyzes these models to create a solid understanding of the relation between impact on the farmer and impact on the service provider's business.

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 Farmfit aims to inform the agricultural sector and catalyze innovations and investment in service delivery that positively impact people, planet, and profit.

Farmfit Intelligence

The data collected through this SDM analysis is aggregated with other data collected through Farmfit's interventions. The aggregation of these insights enables both the benchmarking of different SDMs and the ability to better identify trends and best practices. Farmfit Intelligence's learning takes place at three different levels:

1. Business- and farm-level | Under what conditions can SDMs and coalitions/partnerships of SDMs be effective, cost-efficient, resilient and create a sustainable return on investment, at scale?
2. Enabling environment | What are the key barriers in the enabling environment that constrain the functioning of SDMs and smallholder agricultural markets?
3. Market-wide | How can SDMs and interventions improve the inclusivity, sustainability and commercial viability of smallholder agriculture markets?

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Introduction of IDH and the SDM analysis

Agricultural Commodities Business Unit - Tea program

IDH has been active in the tea sector for ten years. Over these years, we have been addressing core sustainable issues. We have built partnerships across issues ranging from living wage and working conditions, to gender issues including gender-based violence, to living income and smallholder profitability, to climate change and deforestation. Through our partnerships and joint roadmaps, we are working step by step in prominent tea producing regions in Africa and Asia on sustainable production, and on sustainable procurement in Western Europe and Asia.

Over the recent years, large tea packers and producers have made a significant shift to becoming more open to pre-competitive collaboration, to be able to jointly tackle sustainability issues that cannot be dealt with as a single company. This allows IDH to step in and play its convening role to further address sustainability in the tea value chain. IDH is investing in pilots and innovations on the sector level, but also through partnerships with individual companies.

Through our work in East Africa, we are convening the industry to address complex sustainability issues. In Rwanda, Tanzania and Vietnam, IDH focus is on smallholder inclusion and health and safety. In the Southwest Mau landscape, in Kenya, we work together with large tea plantations in the area to conserve and restore 60,000 hectares of forest. IDH is also addressing gender and gender-based violence issues in the Kenyan tea sector, through the multi-stakeholder Gender Empowerment Platform.

In Tanzania, IDH is working as part of the EU Agri-Connect Programme, along with its partners Tea Research Institute of Tanzania (TRIT), CEFA, and Tanzanian Smallholder Tea Development Agency (TSTDA). Our goal is to improve incomes and nutrition of smallholder tea farmers located in Mufindi, Rungwe, and Njombe districts, and we seek to achieve these goals by promoting the inclusiveness, productivity, competitiveness, and resilience of smallholder tea farming. Our work with Ikanga Tea Factory is conducted as part of this EU Agri-Connect Programme.

Thanks

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

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Improving Income and nutrition of Smallholder Tea Farmers in Southern Tanzania

PROGRAM INFORMATION

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Consortium partners

Partner name	About the Partner
IDH the Sustainable Trade Initiative (IDH)	Dutch public-private partnership facility. Lead applicant. Expertise: farmer GAP training, financial decision-making, private sector engagement.
Tanzania Smallholders Tea Development Agency (TSHTDA)	Tanzanian government body. Co-applicant. Expertise and knowledge on Tanzania tea sector and smallholder farmers. Extension officers provide in-kind support to Action.
Comitato Europeo per la Formazione e l'Agricoltura Onlus (CEFA)	Italian NGO, working in Tanzania since 30 years. Co-applicant. Expertise: cooperative development and governance, nutrition, working with the EU in several proposals.
Tea Research Institute of Tanzania (TRIT)	Tanzanian public-private partnership. Co-applicant. Bringing research expertise on innovations in tea sector and implementation of innovations in the sector.

Program Objectives

Overall project objective
Improving income and nutrition of smallholder tea farmers in Southern Tanzania

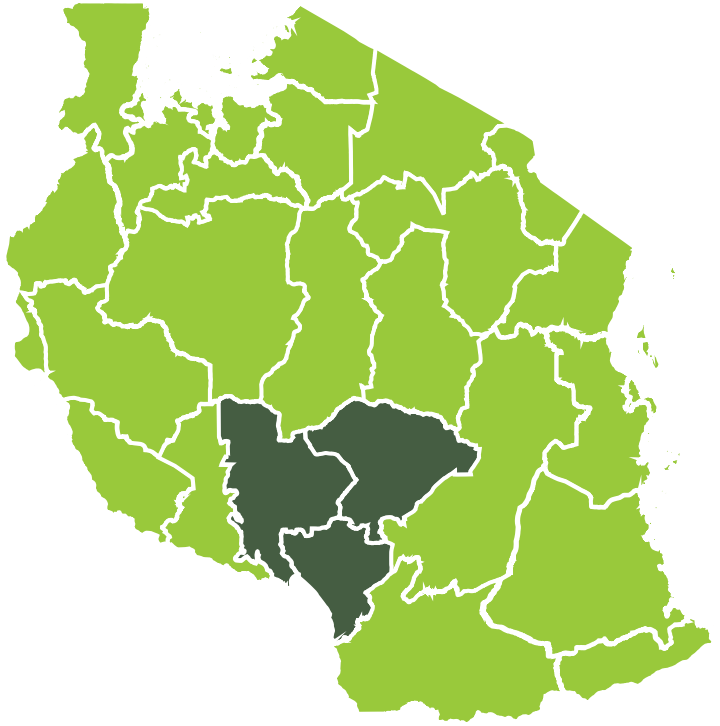
Specific objectives: To promote the inclusiveness, productivity, competitiveness and resilience of smallholder tea farming while fostering sustainable livelihood, nutrition, gender equality, among tea farming families in Southern Tanzania.

> **Specific objective 1**: To sustainably improve the performance and climate resilience of smallholder tea farmers.
>
> **Specific objective 2**: To diversify income generation and reduce malnutrition and stunting in tea farming communities.

Program duration: 4 years

Program beneficiaries & Location

- **Action's primary target group** are 22,000 smallholder tea farmers - 1,600 in Mufindi District Council, 5,000 in Njombe District Council and 15,400 in Rungwe and Busokelo District Councils, thus covering >70% of Tanzania's tea smallholders.
- **The Action's secondary target group are tea farmer cooperatives -** 34 cooperatives and/or farmer groups
- **The Action's tertiary target group are the private sector tea companies** - constrained by the low and inconsistent volume and quality of green leaf supplied by smallholder farmers inefficiencies of service delivery to smallholders.
- **Final beneficiaries** - Approximately 103,000 members of tea farming households (average 4.7 persons per household)



- **Project Period**: 4 years
- **Amount**: 5,560,000 MLN EUR
  - 5MLN EUR funded by EU
  - 560.000 EUR co-funding Consortium members

Work Packages (Key Activities)

1) **Strengthening tea farmer cooperatives:**
   - Provide training to tea farmer cooperatives
   - Stimulate female leadership and youth participation in tea cooperatives
   - Grant financial support to cooperatives to improve service delivery to their members

2) **Sustainable service delivery, training and quality-based payment for tea smallholders:**
   - Introduce sustainable Service Delivery Models (SDM) for tea cooperatives and farmers
   - Build capacity of tea smallholders through Farmer Field Schools
   - Implement a bonus system to promote and reward higher green leaf quality

3) **Implement Sustainable innovations:**
   - Demonstrate and promote
     - optimized nutrient application in smallholder tea farms
     - mechanized tea harvesting services
     - irrigation of smallholder tea farms

Implement Sustainable innovations (continued)
   - Establish improved clone nurseries for increased climate resilience and productivity
   - Promote digital financial and information services for smallholder tea farmers

4) **Income diversification:**
   - Convenes partners for secondary value chain services and offtake
   - Implement SDM for secondary value chain and establish market linkage

5) **Nutrition and household decision-making:**
   - Promote good household nutrition through sensitization, training and demonstrations
   - Build financial literacy and promote balanced decision-making in tea farming households

Expected Results

WORK PACKAGE	OUTPUTS/ RESULTS
1. Strengthening of tea farmer cooperatives	▪ 34 cooperatives improve performances ▪ 150 villages reached through a sensitization campaign on coops ▪ At least 10 cooperative receive grant funding to deliver improved/new services
2. Sustainable service delivery, training and quality-based payment for tea smallholders	▪ 3 service delivery model systems in place ▪ 560 Farmer Field Schools in the target districts are established ▪ Increased green leaf volume of acceptable quality from 50 to 65%
3. Sustainable innovations	▪ TRIT soil lab accredited under international standards ▪ 6 innovations used (Nutrient application, mechanized harvesting, irrigation, improved clones, digital finance and info services) ▪ 1,500,000 tea seedlings distributed to farmers through the established tea nurseries ▪ 80% farmers access digital finance and info services
4. Income diversification	▪ 4 Non-tea value chains strengthened ▪ 50% smallholder tea farming families diversify their income
5. Nutrition and household decision-making	▪ 150 villages reached through a sensitization campaign on nutrition ▪ 1,050 vulnerable households receive start-up kits for vegetable garden and small animal husbandry ▪ 50% smallholder tea farming families diversify their diet ▪ 40% reduction in stunting

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Chapter overview

Throughout the report, you can click the corresponding icons on the left of each page to be taken to the first page of that chapter

1. Executive Summary

- Situation and purpose of the analysis
- Main findings, recommendations and potential next steps

2. Recommendations

- Overview of recommendations
- Supporting arguments and analyses

3. Annex

- Context of the SDM
- Strategy and financial performance of Ikanga Tea Company Limited
- Farmer segments' business case
- Underlying assumptions

1. Executive summary

This section:

- *States the current situation and the purpose of the analysis*
- *Lays out the main findings, recommendations and potential next steps*

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This SDM seeks to answer the question: “How can Ikanga improve livelihoods of smallholders it sources from in order to sustainably secure consistent quality and quantity of green leaf tea supply?”

Situation

- Ikanga Tea Company Limited (Ikanga) is located in Southern highlands of Tanzania in Njombe region. The Company is a subsidiary company of the DL Group, who purchased it from Rift Valley Corporation in 2017. Its primary operations is processing of green leaf (GL) into made tea.
- It currently sources 100% of GL from smallholder farmers spread across 20 villages in Lupembe ward with a total area of planted tea of 1,387.15ha. This encompasses 6,147 registered farmers, of which 3,221 are certified by Rainforest Alliance (RA). Of the RA certified farmers, ~2,800 are active and supply GL to Ikanga under annual sourcing contracts, whilst receiving extension services and training on good agricultural practices (GAP), quality inputs (fertilisers and herbicides) on credit from Ikanga.
- Ikanga’s factory two processing lines have a combined annual capacity of about 11,000 MT of green leaf (2,200-2,600 MT of made tea per year). Ikanga plans to increase overall quality of tea and revenues (and therefore profits). Therefore, it aims to expand production by installing a third processing line, thereby increasing green leaf intake from farmers to 18,000MT per year.

Complication

- Ikanga is currently facing two critical challenges to its continued operations and success in the tea industry:
  - Firstly, Ikanga’s tea production operations have been and are still loss-making. This has weakened its financial strength and stability, both of which are necessary for Ikanga to support the growth of its farmers, employees, and other business stakeholders.
  - Secondly, tea production for smallholders is currently not a lucrative activity and is unable to sustain the basic needs of households to be able to live a decent standard of living.
- These two factors have worked to mutually reinforce each other over the past few years. Ikanga’s operational losses have precluded it from being able to pay farmers for their produce on time and meet its commitments to its partners like input providers, worsening farmers cash flows and ability to invest in tea farms.
- Similarly, farmers who are lacking sufficient capital or motivation to invest in production are choosing to leave their fields dormant, selling to competitors, or selling low- and poor-quality green leaf to Ikanga, thereby keeping its factories running below capacity.
- As a result of these core issues, a second order of challenges arise:
  - Ikanga’s service delivery to farmers has not been able to maintain high standards: extension officers have had to be let go due to funding issues; input supply to farmers on credit has stopped due to non-payment of dues to input providers; and the company has not been able to support in-filling of fields because of lack of own tree nurseries dedicated to farmers.
- Aside from these local factors, Ikanga’s success is also constrained by falling global tea prices aggravated further by the Covid-19 pandemic, as well as the lack of appropriate recognition and quality signaling of Tanzanian tea at auction houses.
- Given this macro-context, the operator and farmer are locked into a vicious cycle that can only be broken through emergency cash infusion into the business and strategic diversification of farm activities, for both to manage risks better.

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Addressing the mentioned challenges requires a three-tier approach which focuses on improving Ikanga's operational performance, strengthening the business case for tea farmers, and bridges the living income gap

Recommendation	Conclusions
Improving Ikanga's operational performance	• To improve its operational performance, Ikanga requires it to: i) secure affordable and sufficient working capital and capex financing; ii) strengthen management capacity and professionalize service provision; and iii) support the development of professionally-run cooperatives. • This study reveals that with a worsening financial position (given current and forecast losses), Ikanga may find it more difficult to attract external or commercial funding. For Ikanga to be able to attract commercial funding, it would first need to turn around its performance. Therefore, **a business process improvement plan** is highly recommended. • Without financing, Ikanga would not be able to implement the other operational improvement initiatives.
Strengthening the business case for farmers	• Strengthening the business case for tea farmers would require Ikanga to: i) develop an effective farmer onboarding and retention strategy supported by an enhanced service package; ii) implement mechanisation services to address labor challenges and increase the cost effectiveness of tea farming; and iii) introduce a quality bonus scheme to farmers to incentivize tea production and quality. • This study shows that **introduction of mechanised harvesting services** would not only bring down prohibitively high costs of production for farmers and boost their incomes (by reducing a labor costs by 85-90%) but would also generate additional income for Ikanga (USD 184,483 over 5 years). • Should Ikanga be able to generate sufficient operating cashflows, it can introduce a bonus scheme to farmers. This would not only incentivize farmers but also increase their income by about ~41%.
Bridging the living income gap and lowering food insecurity	• Bridging the living income gap would first require an estimation of the living income gap and determination of the the most effective drivers to prioritise. On the other hand, to lower food insecurity amongst tea farmers, noting that tea is a cash crop which in addition to poor productivity has been facing dwindling prospects in the global markets, diversification of incomes and food would be critical. • The study reveals that **tea farmers continue to earn significantly below the poverty line and living income benchmarks** (36% and 82%, respectively, below those income benchmarks) considering income from tea farming alone. Amongst land, yield, cost of production and price, land size appears to be the number one driver that can significantly help move farmers towards earning a living income. • Noting the above limitations in tea production, diversification is thus seen as a critical solution to the poor livelihoods of tea farmers. Comparing profitability of crops and animal rearing in Njombe demonstrates **a strong business case for pigs and poultry**, while avocado can also be seen as an interesting crop if farmers can afford the up-front investment.

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For these recommendations we have identified the required next steps, potential partners to involve, as well as the need for technical, financial or other support

Recommendation	Actions required to execute this recommendation	Type of actor most strongly positioned for driving the service	Service providers and/or other stakeholders to collaborate with	Support required?	Next step to be taken
High priority					
Securing working capital and capex financing for Ikanga's operations	1. A detailed financial due-diligence of Ikanga 2. Business process improvement plan 3. Development of a business plan 4. Identification of suitable financing partners 5. New financing facility for Ikanga	SDM Operator(Ikanga) DL Group (parent company)	• Banking and financial institutions • IDH Farmfit Fund (for consultation, not funding) • Turnaround experts	Yes, support is required: • Capital for operations • Technical assistance (TA) on business improvement, focusing on cost optimization and performance turnaround	• Strategic discussions with DL Group management • Development of a business plan for approaching financial institutions
Medium priority					
Strengthening management capacity and professionalizing service delivery	1. Adequate financing is an essential pre-requisite 2. Hiring new extension officers (EOs) and quality control (QC) manager 3. Contracting and implementing ERP software and use cases	SDM Operator (Ikanga) DL Group (parent company)	• IDH Digital Transformation Team • IT consultants • HR and recruitment professionals	Yes, support is required: • Finance for implementation • TA on ERP selection and implementation	• Development of job descriptions for QC and EO positions and start recruitment drives • Consultations with ERP software providers
Implement mechanisation services to address labor challenges and increase the cost effectiveness of tea farming	1. Design and launch of new harvesting mechanisation service under Ikanga	SDM Operator (Ikanga)	• Provider of mechanized harvester • Financial institution for access to finance	No external support required	• Analyse farmer appetite for mechanized harvester (survey) • Develop a business plan

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For these recommendations we have identified the required next steps, potential partners to involve, as well as the need for technical, financial or other support

Recommendation	Actions required to execute this recommendation	Type of actor most strongly positioned for driving the service	Service providers and/or other stakeholders to collaborate with	Support required?	Next step to be taken
Medium priority					
An effective farmer onboarding and loyalty approach	1. Establishing farmer outreach plan 2. Prioritize farmer segments 3. Develop system to track farmer performance and loyalty 4. Finalizing partnerships with TRIT and TSHTDA for in-filling service	SDM Operator (Ikanga) DL Group (parent company)	• TSHTDA • TRIT • Agricon Boresha Chai Program • IT service provider	Yes, support is required: • TA on farmer recruitment and engagement • TA on appropriate KPIs to capture and monitor	• Strategic discussions with Ikanga and DL Group management
Facilitate diversification practices which include new crops and livestock	1. Support farmers in set-up of pig and poultry farming 2. Support farmers in obtaining access to finance for investment of avocado	SDM Operator (Ikanga)	• Farmer Groups / Cooperatives • Produce offtakers • Agricon Boresha Chai Program	Yes, support is required: • TA on value chain development • In-depth market study analysis for each crop and livestock	• Link farmers with pig and poultry offtakers • Link farmers with input providers • Align with DL group on potential for avocado market
Support the development of professionally-run cooperatives to increase efficiency of service delivery	1. Mobilise farmers into determinable groups 2. (Re)registration of cooperatives with relevant government authority 3. Capacity building of Ikanga staff and farmer leaders	Government Agencies Development Agencies	• TSHTDA • Agricon Boresha Chai Program	Yes, support is required: • TA on cooperative development • Capacity building	• Strategic discussions with Ikanga management and TSHTDA • Farmer registration

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Low financial capacity remains the biggest limiting factor for Ikanga in establishing initiatives that would have more impact on the livelihoods of farmers

Company project that requires TA	1. Strategic diversification into crops and livestock	2. Development of cooperatives in Njombe	3. Capacity building to enhance gender equality
Company ability to implement project	**Low** Ikanga's management is not able to take up the responsibility of a diversification program immediately, as this is not part of it short to medium term strategic plans	**Low** Ikanga does not have the capacity to conduct on-ground implementation of a cooperative development project. It can, however, offer local support and guidance to implementing agency	**Low** Ikanga is currently not gender intentional. It would require capacity building to upskill its management and staff on difference aspects of gender equality
Company ability to co-fund project	**Low** Ikanga will not be able to co-finance investments required for diversification into crops aside from tea, noting the financial constraints it currently faces	**Low** Ikanga does not have the financial wherewithal to invest in cooperatives at this point, but could be willing to support by offtaking through cooperatives at a future date	**Medium** Ikanga may be able to utilize its current team to drive the gender equality agenda

2. Recommendations

This section:

- *Contains all the recommendations to improve the business model and overcome challenges*
- *Provides all the supporting arguments to back up the recommendations*

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The below pyramid captures the summary of recommendations and supporting arguments

Question: How can Ikanga effectively increase the livelihood of the smallholders it sources from, in order to sustainably secure consistent quality and quantity of its green leaf tea supply?

Ikanga can improve the livelihood of smallholders and secure sustainable supply of green leaf by: ① restoring and strengthening farmer engagement; ② making tea farming economically attractive; and ③ bridging living income gap and lowering food insecurity

Recommendation 1:
Restore and strengthen engagement with tea farmers through operational excellence

Pillar 1

- **1.A** Secure affordable and sufficient working capital and capex financing to strengthen Ikanga's operating cashflows
- **1.B** Strengthen management capacity and professionalize service provision to increase the value Ikanga delivers to farmers
- **1.C** Support the development of professionally-run cooperatives to increase efficiency of service delivery

Recommendation 2:
Make tea farming economically attractive to farmers through the provision of high-quality services

Pillar 2

- **2.A** Develop an effective farmer onboarding and retention strategy supported by an enhanced service package
- **2.B** Implement mechanisation services to address labor challenges and increase the cost effectiveness of tea farming
- **2.C** Introduce a quality bonus scheme to farmers to incentivize tea production and quality

Recommendation 3:
Bridge living income gap and lower food insecurity through diversification initiatives

Pillar 3

- **3.A** Estimate the living income gap and determine the most effective drivers to prioritise
- **3.B** Facilitate diversification practices which include new crops and livestock that can improve farmers' food security and cashflow

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Recommendation 1:
Restore and strengthen engagement with tea farmers through operational excellence

Pillar 1

1.A

Secure affordable and sufficient working capital and capex financing to strengthen Ikanga's cashflows and operational capacity

1.B

Strengthen management capacity and professionalize service provision to increase the value Ikanga delivers to farmers

1.C

Support the development of professionally-run cooperatives to increase efficiency of service delivery

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Ikanga's current and forecast performance reflects a worsening financial position, which exacerbates its inability to attract external funding

- Whilst Ikanga has had legacy financial constraints, such us pre-existing loans and creditors, and huge amounts owed to it by the Tanzania Revenue Authority (~USD 3.6 million), it continues to make losses. This is primarily driven by high cost of production (USD 1.55/kg of made tea) resulting from suboptimal factory operations, compared to an average sales price of only USD 1.08/kg of made tea. Ikanga does not appear to benefit from economies of scale as a result of increased sourcing volumes, noting the fixed unit cost of production.

- Under these conditions, Ikanga cannot breakeven, particularly at gross profit level and would require either a significant increase in market price or a significant reduction in its cost of production. In order to attract better market prices, Ikanga needs to invest in improving the quality of its made tea, therefore increasing the ratio of primary grade tea above its current target of 80%. However, with the dwindling global market conditions for tea, it would be difficult for the company to fetch higher prices in the short to medium term.

	Actuals		*Estimates*	*Projections*				
Income statement (USD)	**FY18/19**	**FY19/20**	**FY20/21**	**FY21/22**	**FY22/23**	**FY23/24**	**FY24/25**	**FY25/26**
Revenue								
Tea sales								
Cost of sales								
Tea sales								
Gross profit								
Operating expenses								
Staff costs								
General & admin costs								
EBITDA								
Depreciation								
EBIT								
Finance costs								
EBT								

- In order to breakeven, Ikanga would need to achieve the following optimal level KPIs:
  a) Price of primary and secondary grade of USD 2.08/kg and USD 0.75/kg, respectively, of made tea; and
  b) Ratio of primary and secondary grade tea of 88%:12%; and
  c) Unit cost of production of USD 1.45/kg of made tea.
- Of the above three levers, Ikanga has more control on the quality mix and cost of production than the market prices

** Ikanga did not provide its income statements for the most recent two year, FY19/20 and FY20/21.We have therefore estimated this based on assumptions and other inputs provided by Ikanga. The Company's financial year runs from July-June.*

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For Ikanga to be able to attract commercial funding, it would first need to turn around its performance. A business process improvement plan is therefore highly recommended

- It is imperative that Ikanga obtains immediate funding in order to be able to: i) settle historical debts such as amounts owed to farmers ([redacted]), amounts owed to input suppliers, particularly Yara ([redacted]) and legacy GBF loan ([redacted]), all outstanding as of March 2021; ii) meet current and future working capital and capex requirements; and, iii) invest in strengthening management capacity and enhancing service provision, including introduction of mechanised harvesting (see slide 24 for details).

- A comparison of the costs and benefits of internal (Group) and external (financial institutions including banks and development institutions/donors) shows that **internal financing** would be the **most feasible** source of financing for Ikanga in the **immediate and short term**.

		Without mechanisation					With mechanisation				
Forecast funding requirements	**Unit**	**FY21/22**	**FY22/23**	**FY23/24**	**FY24/25**	**FY25/26**	**FY21/22**	**FY22/23**	**FY23/24**	**FY24/25**	**FY25/26**
Working capital	USD	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Capex	USD	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	**USD**	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Internal (Group) financing	Vs	**External (commercial, grant) financing**
• Ease of access – no need for elaborate due diligence and protracted engagement process and can negotiate flexible repayment terms • Cheaper for Ikanga as only a nominal interest rate, or no interest at all, would be charged on the amounts borrowed		• Potential for grant/donor funding from development institutions given Ikanga's primary focus on smallholder sourcing • A tripartite financing agreement can be entered into between Ikanga, financial institution and input provider to establish a revolving input credit scheme • Potential of receiving de-risking facilities from an impact investor to catalyse funding from a commercial bank
• Lack of adequate funding from the Group if other subsidiaries are also underperforming, thus little retained earnings and can be distributed to Ikanga • May require shareholders to inject capital into the business, which may be limited if the Group has other priorities different from Ikanga		• Business is currently not bankable, given continuing losses and weak balance sheet (as a result of historical debts and carried forward losses) to provide security for external debt financing • High cost of local commercial debt, currently at 18% • Lengthy engagement and contracting processes • Grant funding is not sustainable in the long term and may only be available for farmer capacity building

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Professionalizing and improving service delivery will require strengthening capacity and additional investment in divisions that currently work with smallholder farmers

Current situation

Ikanga has been offering a couple of services to farmers directly, but has faced a number of challenges which have limited its ability to do so efficiently and effectively. See Service Delivery Model overview for details.

Recommendations

1 Increase resources towards key operational functions

- Currently, only 4 Ikanga extension officers (EOs) to serve all of Ikanga's ~2,800 active farmers, an engagement ratio of 1 officer to 700 farmers. This can compromise depth of engagement and remediation of practices with individual farmers.
- An expected 16 government officers supplements this force. To meet an ideal ratio of 1:300, Ikanga would need to add 8 more to its own team by Year 5, at an annual cost of USD 9,764 per officer.
- Ikanga needs to refinance its input credit scheme, which has been suspended since 2018.
- Ikanga should consider recruiting a quality control/ compliance manager to improve factory output and quality of incoming GL.

2 Improve efficacy of service delivery activities

- Current training curriculums do not cover many essential topics that can help farmers better manage their tea production business.
- Ikanga should fill these gaps by adding modules on farm management and record keeping, managing soil erosion, sustainable agriculture, climate change, and non-business topics like farming as a business, nutrition, diversification, and gender inclusion.
- Ikanga can partner with the Agricon Boresha Chai program that is currently developing farmer field schools and curriculums.

3 Institutionalize a performance measurement and monitoring framework for service delivery

- Data on types of trainings, farmer attendance, input uptake, yields, etc., are spread across different systems and are difficult to collate farm indicators and to get a comprehensive view of how services are impacting farmers.
- A monitoring, evaluation, and learning (MEL) framework for Ikanga's service delivery unit can help set clear targets for employees, streamline data collection processes, and enable Ikanga to measure the impact of its services and take corrective measures where required.

4 Restructure financial reporting and management

- Ikanga's accounting system and servers are currently not operating, and it has to rely on HQ to prepare financial statements.
- This lead to a lower diligence in financial management and slower response times to the company's own financial needs.
- Ikanga should invest in a functional financial reporting and management system to be able to timely obtain reports on the financial affairs for the company. This will be critical to fundraise to solve for its financing issues.

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To supplement the aforementioned efforts, Ikanga should consider piloting a digital enterprise resource planning (ERP) system that brings all its data under one integrated system

Operational data
on farmer services, sourcing and processing, staffing, etc.

+

Financial data
Accounting, financial planning and financial review processes and systems, etc.

=

Solution: Digital ERP systems

- **ERP systems** integrate all business management functions including planning, inventory/materials management, engineering, order processing, manufacturing, accounting and finance, human resources, etc. The biggest advantage of an ERP system lies on its real-time capabilities and the ability to see what is going on within the organization as it happens, whilst concurrently managing smallholder farmers and field activities.
- Examples of service providers in Africa include:
  - PanAgro Agri ERP https://agrierp.panapps.co/ (available in Tanzania)
  - Capagri http://www.cap-agri.com/
  - FarmERP https://www.farmerp.com/case-study
  - Farmlogics https://farmlogics.com/
- For further support in identifying, interviewing and selection a potential ERP solutions provider, Ikanga can seek the support of IDH's Digital Transformation team: https://www.idhsustainabletrade.com/project/solution-design/

Rationale

- As Ikanga updates its farmer management services and financial management as recommended on Slide 16, it can integrate the two systems and incorporate data systems of all its key departments under one umbrella (including sourcing, human resources, etc.).
- This integration can have a host of benefits, including:
  - Integrating and sharing of information across different departments;
  - Reducing redundant data entry and processes;
  - Guarantee for the security of organization data;
  - Better communication across various departments; and,
  - Improving workflow and security.
- For Ikanga, this can improve response time for field services, make sourcing more adaptive to market and field signals, and help employees coordinate efforts across departments better, and revise budgets and resources as per the needs of its farmer onboarding program.
- Costs to consider include costs of software purchase, implementation, maintenance, training of staff, and data conversion.

Source: Farmfit Digital Transformation Analysis and Advice https://www.idhsustainabletrade.com/project/farmfit-digital-transformation-analysis-advice/;

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2. Recommendations | 1.C: Support the development of professionally-run cooperatives

Whilst professionally run farmer organisations have been shown to improve efficiency of service delivery, Ikanga would need technical and financial support to establish functional cooperatives in Njombe

- Cooperatives in general are currently not fully functional in Njombe. Less than 10% of farmers in the region are members of a cooperative, with most farmers abandoning participation due to poor services received against mandatory membership fees.

- However, with the government regulations requiring companies sourcing from smallholder farmers to do so through formal cooperatives, it is crucial for Ikanga to be at the core of facilitating the establishment of a fully functional cooperatives for its member farmers. However, given its financial constraints, and benchmarking from other successful cooperative models in Southern Tanzania[1], there is inevitable need for partnerships between Ikanga and external aid agencies who bring in development finance and subsidize the cost of

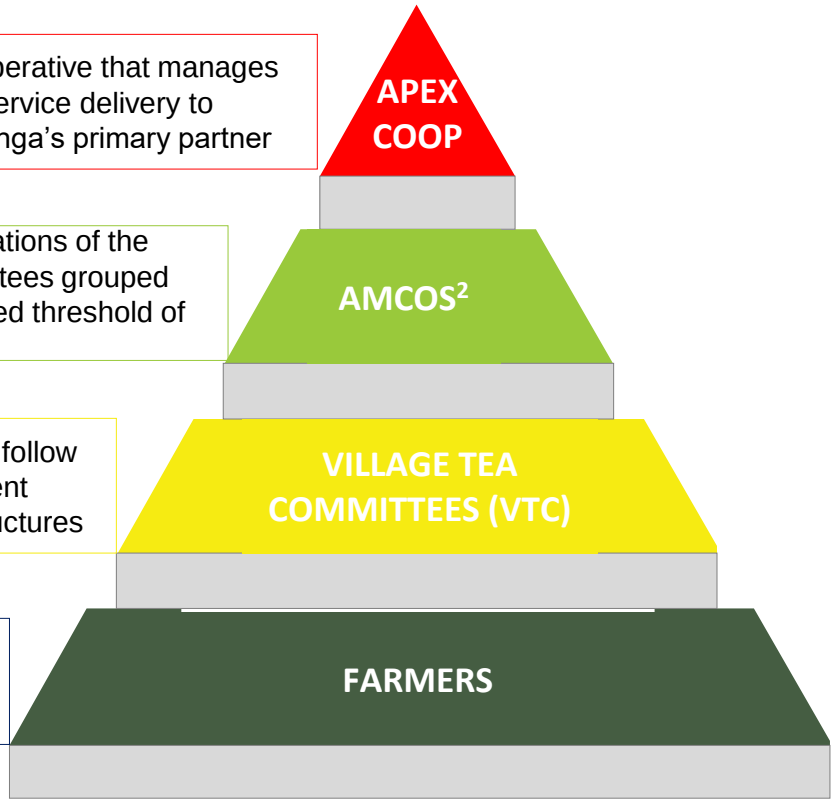
Potential set-up of farmer organisations

The umbrella cooperative that manages and coordinates service delivery to farmers and is Ikanga's primary partner

Oversee the operations of the village tea committees grouped based on an agreed threshold of VTC

VTC organized to follow existing government administrative structures

Individual farmers spread across various villages



Best practices in management of farmer organisations

1. **Mandate:**
   - Facilitating: access to finance (savings and credit products); access to inputs and planting materials, access to markets through partnership with buyers/offtakers; and coordinating agricultural extension and training services.
2. **Management and governance:**
   - Democratically elected Board with an appointed manager and treasurer at the apex cooperative, should be led by a skilled Chief Executive Officer.
   - Competent Management team appointed by the Board that oversee the day-to-day activities of the farmer organisations.
   - Strong and independent supervisory Board comprising of members with different but complimentary professional profiles.
   - Independence between Board and Management to enhance accountability, with management reporting to the Board.
   - An advisory committee of non-members with specific technical expertise in running of cooperatives and tea processing.
   - Regular meetings to facilitate accountability and decision making such as annual general meetings(AGMs).
3. **Funding and capacity building:**
   - Membership fee augmented by surplus from service fees and potentially management fee from Ikanga. At set-up, development aid may be utilized to fund staff salaries and operations.
   - Third party experts to provide training and advisory services to the cooperative, including development of a strategic business plan outlining how it can grow into financial independency and viability.

Source: TSHTDA website; 1) a cooperative set up by as a result of a partnership between the Wood Foundation, Gatsby Africa, DFID, and Unilever, and RBTC-JE, set up with the support of Agriterra and WATCO, 2) Agricultural and marketing co-operatives societies (AMCOS)

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Recommendation 2:
Make tea farming economically attractive to farmers through the provision of high-quality services

Pillar 2

2.A

Develop an effective farmer onboarding and retention strategy supported by an enhanced service package

2.B

Implement mechanisation services to address labor challenges and increase the cost effectiveness of tea farming

2.C

Introduce a quality bonus scheme to farmers to incentivize tea production and quality

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Ikanga should have a twin focus on farmer onboarding as well as improving their loyalty and performance; for the former it can use the segmentation approach suggested in this report

Current situation

Ikanga does not currently segment its farmers formally, but rather has a "rule of thumb" approach to service delivery, i.e., farmers who sign a contract and supply to Ikanga get trained and certified, and additionally farmers who sell 1,000kg of green leaf get access to inputs on credit.

Challenges

- Ikanga's approach does not have a clear strategy of onboarding new farmers.
- It does not also have mechanism to measure impact of its services.
- As a result, services cannot be fine-tuned or differentiated for the varied needs of different kinds of farmers.

Objectives

Short-medium term

1. **Onboard new farmers** to meet sourcing volumes required to fill factory capacity

Medium-long term

2. **Improve performance and loyalty of farmers** in order to receive consistent supplies of high-quality green leaf while increasing farmer incomes

Approach

- In order to effectively onboard new farmers, Ikanga can use a simplified segmentation approach suggested in this report (shown on the next slide).
- There are two types of farmers outside existing farmers that Ikanga can target: **Baseline farmers** who currently work and sell to competitors in the region, and **Dormant farmers** who have suspended tea production recently and need to be activated again.
- Ikanga and these farmers will have to address trade-offs of joining the sourcing program which are discussed on slide 21.

- For farmers that have been onboarded and become active farmers, Ikanga should focus on high-quality and consistent delivery of existing and new services.
- Services that directly lower the costs of production for farmers or increase revenues will have the most impact on farmer loyalty, motivation and performance, and thus should be focused on. See slide 22 for details.
- In particular, Ikanga should start measuring performance of farmers to assess the impact of services on indicators that are important to the business.
- This would allow it to both assess the efficacy of its own service delivery, as well as the performance and behaviours of different types of farmers.
- Based on this data, Ikanga can consider a more nuanced segmentation approach in the future where it customizes its services for unique farmer profiles.

Source: Farmfit analysis

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The suggested segments have different farm characteristics and production needs, both of which must be considered as they are approached for onboarding onto Ikanga's sourcing program

Segment	BASELINE	SDM ACTIVE	SDM DORMANT
Description	These farmers have no working relationship with Ikanga. They are actively engaged in tea production but sell all their produce to Ikanga's local competitor	These farmers sign annual contracts with Ikanga, have supplied to them for the past 12 months consistently, and are the main beneficiaries of Ikanga's current services	These farmers once had contracts with Ikanga and are present in their database, but abandoned their tea farms due to the poor rewards from tea cultivation
Characteristics (2021)			
Total farm size	**3 acres**	**3 acres**	**3 acres**
Tea farm size	**1 acre**	**1 acre**	**1 acre**
Yields	**2,732kg/acre/year**	**3,238kg/acre/year**	**1,821kg/acre/year**
Year 1 tea income	**USD 272**	**USD 206**	**USD 236**
Needs	• Baseline farmers produce less than active farmers but have higher incomes largely due to receiving a better price from competitors. • To join Ikanga's program, they would need cost-reducing and yield enhancing services like in-filling and mechanization for Ikanga to be advantageous to them. Without this, they stand to lose.	• Active farmers have the highest yield but take home the lowest net income largely due to very high labor costs. This is driven by higher level of farm activity, in line with GAP. • Their biggest need, therefore, is to lower their cost of labor through mechanisation services. • To ensure they are retained in the program as the most loyal farmers, they should be first in-line to receive a bonus incentive.	• Dormant farmers do not maintain their tea fields proactively and only harvest and sell intermittently through the year. • They would need to substantially increase investment in labor and inputs to resume functioning with Ikanga, and lose 87% of their income in doing so. • It is not recommended to onboard dormant farmers without external subsidies that can offset this loss.

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To support this onboarding and retention, Ikanga will need to enhance its value proposition to its existing and new SDM active farmers by bringing them additional services

To implement	To incentivize	To facilitate
Mechanization *Labor costs for harvesting are prohibitively high for active farmers, and farmers cannot purchase harvesting machines on their own. This present a strong opportunity for Ikanga to build a rental business for a two-person plucking machine. Machines can be leased to farmers during harvest days, lowering labor costs for farmers and bringing in new revenue for Ikanga*	**A performance bonus scheme** *In the years where Ikanga is able to generate surplus due to improved tea quality and/or higher market prices, it should pass on a proportion of this to farmers in the form of a performance bonus.* *Farmers who have been with Ikanga the longest should receive priority for this scheme in order to incentivize long-term participation in the program.*	**In-filling/seedlings** *Facilitate farmer access to TRIT and TSHTDA run nurseries including registration of demand, transport, and extension services, to increase productivity per acre* *TSHTDA sells a seedling at a subsidised rate of TZS 60 which cannot be matched by Ikanga. Ikanga can play a facilitative role by registering farmer demand, connecting them to TSHTDA, and helping with training and extension to properly plant and maintain new seedlings*
Details on the impact of this service on slide 24	*Details on the impact of this service on slide 25*	*Details on the impact of this service on slide 64*

Source: Farmfit analysisp

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Enhanced services can improve incomes of both tea farmers and Ikanga; the actual impact of these changes must be measured and studied carefully to make necessary strategic decisions

Farmer impact of enhanced SDM as per projections

Active farmers (current and newly onboarded) can see a **~9% increase in net incomes** from tea by year **10** and between a **60-80% increase in their tea yields** over the same period.

Dormant farmers would potentially see a far greater of **~27% increase in net incomes** from tea by **year 10.** However they would suffer an **87% reduction in income** in the beginning and take till year 8 to receive a net positive result from reactivating as Ikanga farmers.

Without a substantial subsidy/assistance program, onboarding dormant farmers risks pushing them **deeper below the poverty line.**

Ikanga can potentially generate a total **revenue of** USD 184,482 **over 5 years**, from a **new harvesting mechanization service**

Measuring impact on farmer performance and loyalty

Why	To test the assumptions in this SDM model in real-life and measure the impact of enhanced services on key parameters of farmer loyalty and performance.
What	A composite index made up of measures of loyalty, motivation, capacity, and farm outputs. These could include: • Years supplying to Ikanga; • % of produce sold to Ikanga; • % total farm devoted to tea; • % of trainings attended every quarter; • Evidence of use of supplied inputs and practice of GAP; • Monthly yields; and • Produce acceptance rate/rejection rate.
How	• Extension officers should increase the frequency of updating their farm database to capture these dynamic variables and make more frequent changes to their service delivery based on results seen on farm • This can be done more cheaply by recording data on mobile phones/tablets, and using a sampling methodology if not all farmers can be covered every quarter. See capabilities of an ERP system on slide 17.

Details on impact numbers can be found on slide 63 and slide 65

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Mechanization of harvesting activities can bring down prohibitively high costs of production for farmers and boost their incomes

Challenge

- Tea production is very labor intensive: activities such as tree cutting, pruning, and plucking/harvesting require 100+ days of labor per year at an average rate ranging between TZS 6-10k per day.
- **Labor costs constitute between 50 - 66% of total costs of production**, depending on the segment of farmers.
- This is primarily due to labor costs of harvesting, which constitute between **85% to 90% of total labor costs** for farmers.
- Further, labor availability has declined steadily over the past decade as youth migrate towards better paying blue collar and service jobs.
- As a result, these unmet/infeasible costs of manual harvesting are a **key driver of low net incomes** of active farmers, and a **reason for dormant farmers dropping** out of active tea production.

Solution:

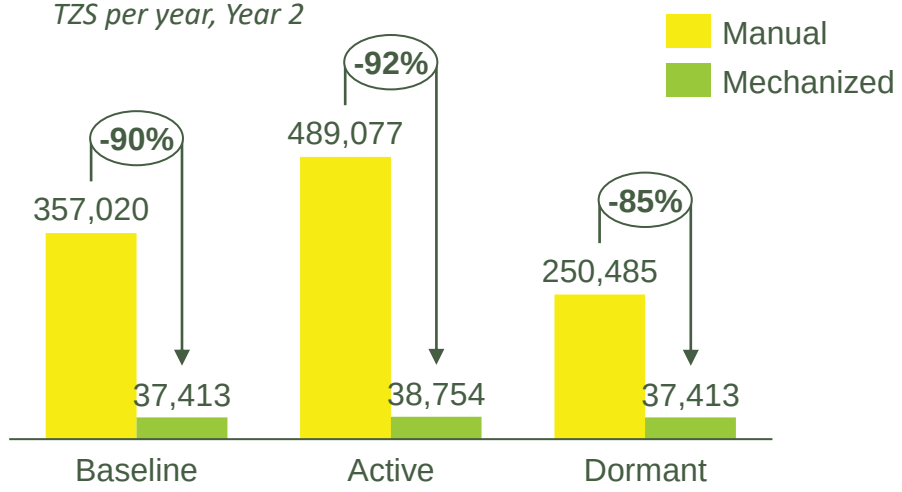
- A two-man plucking machine is the most widely recognized solution to improving harvesting productivity on smallholder tea plots.
- It typically cost **TZS 5 million per machine** and imported models are available in markets in Dodoma. These have a capacity of **plucking 300-500 kg of GL per liter** of fuel spent.

Considerations

- Whilst mechanized harvesting is seen a solution to the high harvesting labor cost, mechanized harvesting **may result in lower green leaf quality**, compared to manual harvesting that can achieve the required plucking specification of two leaves and a bud.
- Subsequently, lower leaf quality would impact the **price** received by Ikanga for its made tea.
- Ikanga will need to invest in a dedicated training program that covers updated harvesting schedules, safe and optimal machine operation, and tea bush maintenance, all of which will differ from existing knowledge and practices of manual harvesting methods

Annual labor expenses for farmer segments with and without mechanization of harvesting

TZS per year, Year 2



- Based on our calculations, Ikanga can launch this service at a highly competitive cost of **TZS 80.5/kg of GL.**
- With the introduction of mechanisation, **labor costs** can go down by around **85-90% per year** for all farmers.
- Overall, mechanisation of harvesting can **improve tea net incomes** of farmers by about **33-40% annually**, with the biggest benefits seen by Baseline and Dormant farmers as machines help offset the additional labor activities they would be required to do to harvest as per GAP guidelines.

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A bonus scheme that provides an active farmer an additional price of USD 0.01/kg of green leaf has the potential to increase net income of SDM active farmers by 41% on average

Overview

- Tea is harvested through the year, with peaks between January-May, and troughs in July-November. (See slide 64 on monthly cashflows).
- Most farmers are paid into their bank accounts directly. A smaller percentage (<10%) receive payments through their SACCOs.
- Ikanga also deducts the cost of inputs provided to farmers (provided in November) from these payments in tranches of 4-6 monthly deductions starting in January.
- However, Ikanga has been unable to pay farmers within the stipulated time (15th of every month and has arrears running into months that it is currently trying to offset.
- While a bonus scheme has been in consideration previously, Ikanga's precarious financial situation and existing outstanding dues to farmers have precluded it from implementing this.
- Based on this SDM analysis, a bonus scheme could only be feasible if tea prices were to recover from their current levels, leading Ikanga to break-even in its tea production business (see slide 14).
- Such a scheme would solve two problems for Ikanga: it would increase loyalty and retention of farmers and increase their incomes. Combined, this may lead to greater farm investments and quality of leaf produced by farmers.
- A bonus would be most beneficial to farmers if given in the months of September-November, when farmer cashflows fall to their annual lows.

Net income for a Year 2 SDM active farmer
(USD/year)

Modeled assumption

Farm gate price for green leaf (USD/kg GL) → *Quality bonus (USD/KG GL)*

Productivity (kg GL/acre) ↓

	0.117	0.123	0.13	**0.136**	0.143 (0.01)	0.150 (0.01)	0.157 (0.02)
1658	-16	-8	1	10	19	28	38
2072	11	21	32	43	55	67	79
2590	45	58	71	85	100	115	130
3238	87	103	120	**138**	156	175	194
3886	129	149	169	191	212	234	258
4663	180	204	228	254	279	306	335
5595	241	269	298	329	360	392	426

- A cash bonus to tea farmers if prices improve from current levels of USD 0.136/kg GL can improve their net incomes from tea. For example, if Ikanga pays farmers **15% more per kg of GL** from current prices, it can **increase tea net incomes by ~41%.** However, a drop in prices of **just 5%** can lower tea net incomes by **~13%.**
- In absence of price changes, improving productivity can be a strong lever too: A **~40% increase in productivity** from current levels results in an **~80%** increase in tea net income of farmers.
- If both occurred together, say the bonus payment leading to improved farm investments and hence productivity, farmer net incomes could rise by **~140%.**

Notes: The sensitivity table here is benchmarked at current (Year 1) yields of active farmers, and prevailing farm gate price. The farm gate price maximum is the price paid by Ikanga's competitor currently. Productivity ceiling is 5,261kg GL/acre, slightly below the maximum shown here

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Recommendation 3:
Bridge living income gap and lower food insecurity through diversification initiatives

Pillar 3

3.A

Estimate the living income gap and determine the most effective drivers to prioritise

3.B

Facilitate diversification practices which include new crops and livestock that can improve farmers' food security and cashflow

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An estimate of tea farmers in Njombe district show that these farmers currently earn significantly below the poverty line and living income benchmark

Drivers of household income

- Farmer income is affected by several drivers: yield, price, land size, cost of production (CoP) and diversification income. For Tanzanian tea farmers in general, land size appears to be the key driver to increasing farmer income. However, before recommending this to specific farmers, there needs to be a clear business case[2]. Also, yield, price, CoP and diversification have a positive potential income effect, but often to a lesser extent[2].

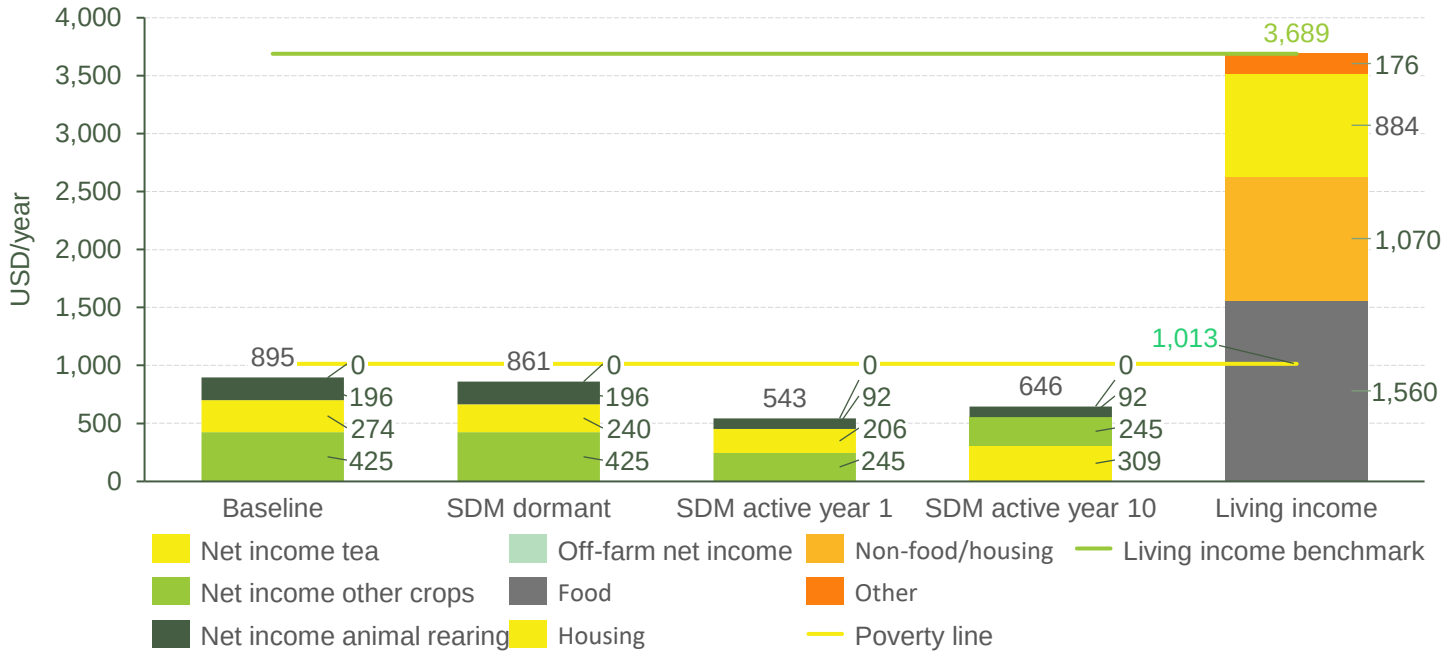
1. In Njombe, average tea smallholder yields are well below the optimal yields, which are estimated around 5,261kg of green leaf per acre[4] (1,821kg/acre for dormant farmers, 2,732/kg/acre for baseline and 3,238kg/acre for active farmers). This is largely due to limited access to agro-inputs and lack of GAP application.
2. Additionally, the average tea bush density in Njombe is suboptimal with 3,707 bushes per acre for Baseline and 3,856 bushes per acre for active farmers compared to a recommended density of 4,000 tea bushes per acre for traditional seedlings, which contributes to the low overall tea yield per acre.
3. Based on PDC data, whilst Njombe farmers consider tea farming as their main source of income, it only currently contributes an average of 31-38% of their income. Other crops and income from animal rearing contribute on average of 62-69% of total net income, with most Njombe farmers not generating any additional off-farm income.
4. With globally low tea prices and Tanzanian tea attracting some of the lowest prices at Mombasa Auction compared to other East African counterparts, the price is clearly a limiting driver for farmer income.
5. Additionally, CoP is high as competing crops are putting pressure on hired labor, which is especially critical for plucking.

Household income situation

- In Tanzania, the annual average household income for tea farmers in the Southern Highlands is USD 752[2].
- However, the tea farmers in Njombe generate an annual total HH net income between 543 and 895 USD, as per the graph below, and consists of income from tea, other crops and animal rearing. Most tea farmers in Njombe do not have income generated through off-farm activities.
- This total HH net income of tea farmers in Njombe is clearly significantly below the poverty line of USD 1,013 per year and living income of 3,689 USD per year[6,3].
- The SDM active farmer, after participating for 10 years in Ikanga's SDM, would earn a total HH income of USD 646.

Njombe household income compared to the living income benchmark[3]

Average income and living income of an HH in Njombe district (USD/year)



Sources: [1]DHS Tanzania. [2]IDH (2020) Income driver analysis.[3]WageIndicator (2019) Living wage series. [4]TRIT. [5]PDC data. [6]World Bank (2016), Online PPP database, private consumption.
***The poverty line adjusted for purchasing power is estimated at USD 253/individual/year in Tanzania. For a farmer household consisting of 4 members (average HH size based on PDC collected), this equates to USD 1,013 per household annually. *The living income benchmark for a standard family of 4 equates to USD 3,689 per household annually.*

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Excluding diversification, land size appears to be the number one driver that can significantly help move farmers towards earning a living income, compared to the other drivers

- Even after 10 years, SDM active farmers with an annual net household income of USD 646 would earn significantly below the poverty line and living income benchmark* (64% and 18%, respectively, of those income benchmarks). This indicates a clear need for support towards these tea farmers to lift them out of poverty.
- The table below demonstrates which drivers of income could have the largest impact towards increasing SDM active farmers' total net income of USD 646 per year towards the living income benchmark** of USD 3,689 per year.
  - SDM active tea farmers own on average 3 acres of farmland. A redirection of all farmland towards tea farming would lead to the highest direct increase in net income.
  - Additionally, tea farmers could embark on other income generating activities such as cash-crop cultivation, animal rearing, timber or off-farm activities. However, these might require additional farmland, which might compete with land dedicated to tea farming.
  - A rain-fed SDM active tea farmers could also increase yields further up to 8,195 kg/acre, although these yields are often only obtained through applying professional farming practices such as timely plucking, sufficient plucking rounds, sufficient and timely fertilizer and 100% GAP application.
  - Alternatively, SDM active tea farmers could hire mechanized harvesters for plucking, allowing them to decrease CoP to USD 0.060/kg of green leaf.
  - Lastly, if Ikanga can provide a quality bonus to farmers to top up the current farm-gate price, this could lead to a further net income increase of 12%.
- A combination of all drivers, excluding diversification and tea price, could lead to an income increase of 244% up to USD 2,224**. The driver tea price is excluded as this is not within the direct control of the SDM active farmer, while the diversification driver is excluded as the additional space for optimization is analyzed in more detail in the next slides.

Drivers of HH income	Baseline assumption	Required assumption for reaching living income of 3,689 USD/year	Potential optimal
Land size (acre)	*1*	*Max 3 [USD 1,264 ~ income increase of 96% ~ remaining living income gap of 66%]*	*USD 2,224 ~income increase of 244% ~ remaining living income gap of 40%*
Yield (kg Greenleaf/acre)	*5101*	*Max 8,195 [USD 833 ~ income increase of 29% ~ remaining living income gap of 77%]*	
CoP (USD/kg Greenleaf)	*0.076*	*Min 0.060 [USD 728~ income increase of 13% ~ remaining living income gap of 80%]*	
Price (USD/kg Greenleaf)	*0.137*	*Max 0,152 [USD 721 ~ income increase of 12% ~ remaining living income gap of 80%]*	*Remains static*
Diversification (USD)	*336*	*3,380 [USD 3,689 ~ income increase of 471% ~ remaining living income gap of 0%]*	*Remains static*

**The poverty line for a farmer household consisting of 4 members equates to USD 1,013 annually. The living income benchmark for a standard family of 4 equates to USD 3,689 annually.*
*** The tea price used in this analysis remained static and thus assumes that also external influences such as the global tea price does not incur changes.*

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Avocados and pig rearing have strong enabling factors that can help farmers scale up production in these value-chains

Opportunities and challenges of selected diversification crops and livestock for farmers

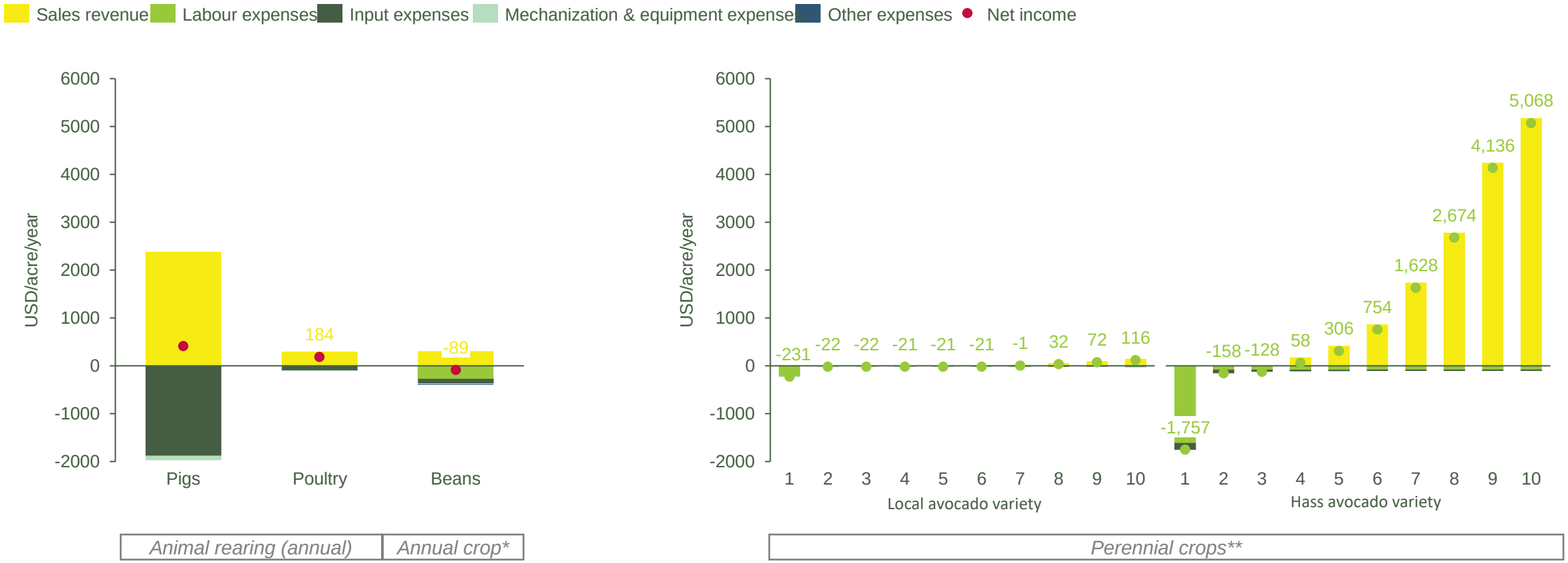
Criteria	Indicators	Avocado	Beans	Pigs	Poultry
Markets	• Demand trends • Channels	• Rising demand at lucrative prices for Haas variety, especially for export markets	• Mostly subsistence for home consumption	• Growing pig consumption locally with attractive margins in domestic markets	• Strong growth trends and production can substitute expensive imports in the local market
Agronomy	• Technical expertise required	• High need for TA and value chain development if happening at scale	• Widely grown in the region already, but mostly low-yielding varieties that are not profitable	• Modest new expertise needed to top up existing practices in the region	• Modest new expertise needed to top up existing practices in the region
Production	• Costs and availability of inputs	• High upfront cost of seedlings/trees but regional availability improving	• Inputs easy to find but very high cost of labor relative to income	• Specialized veterinary care and inputs required	• Specialized veterinary care and inputs required
Food security	• Impact on HH nutrition	• Nutritionally dense with good fats, but most production is sold on the market	• Good sources of essential micronutrients for the household	• Not for domestic consumption but can be a good source of protein and energy	• Eggs and meat are excellent sources of protein for the household
Gender	• Impact on gender balance or equity	• NA	• Easy availability of nutrition from homestead benefits women and children of household		
Overall opportunity		Attractive opportunity to create a new farm business for commercial production	Already widespread so additionality may be limited, but crop offers good nutrition	Both pigs and poultry have attractive commercial opportunity for farmers in the region, and small-scale animal rearing could offer both better incomes and nutrition at the household level	

Source: Primary data collection (PDC) conducted by Akvo, Expert interviews with IDH Tea program team

Comparing profitability of crops and animal rearing demonstrates a strong business case for pigs and poultry, while avocado can also be seen as an interesting crop if farmers can afford the up-front investment

Profitability per crop and animal rearing activity

Revenues, labor, input, equipment and transport cost, and total annual net income in USD per acre for crops and in USD per year for animal rearing*



Note: The presented crops and livestock are not an exhaustive list. This list is based on the most relevant crops for Njombe farmers.
* Bean cultivation is negative due to the required quantity of hired labor for farms =<1acrea and farmers retaining 40% of their produce for own consumption.
Sources: IDH diversification data collection for Ikanga

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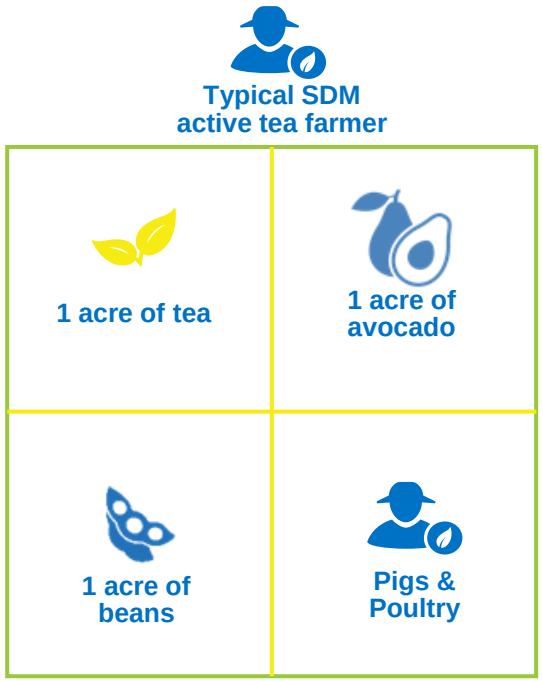
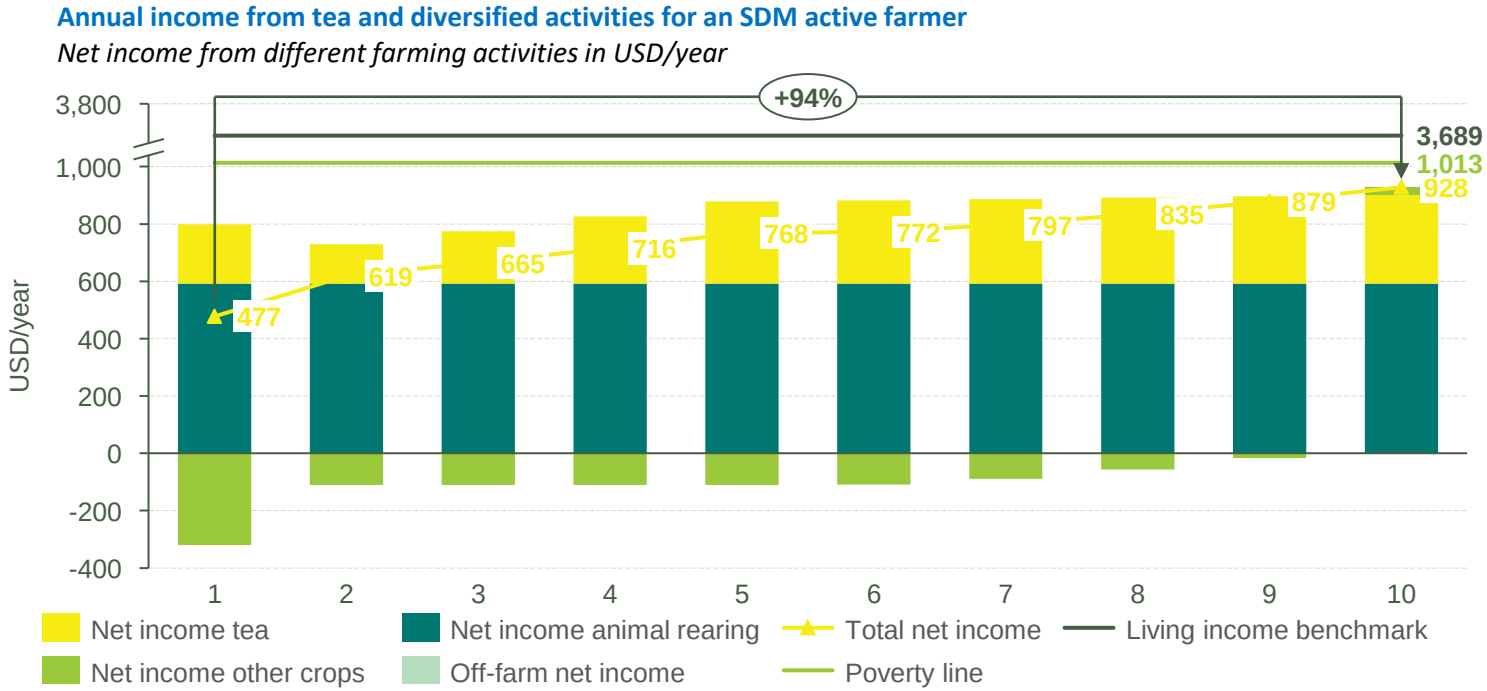
Combining profitable activities such as poultry and pig production, which can generate a return within 1 year, with more investment-intense crops such as avocado or beans could increase income by 94%

- PDC data on Ikanga active farmers has shown that tea farmers have on average a 3-acre farm and most farmers cultivate three different crops. The main crop is tea, to which 1 acre is dedicated, while the remaining two acres are commonly cultivated with maize, beans and/or avocado – with a 50-50% split.
- Most Ikanga farmers also have several animals in their farm, of which pigs and poultry are most common.
- The diversification scenario modelled below represents this situation and demonstrates the impact of investing in poultry and pigs, whose steady annual returns allow for investment in local avocado trees, which in turn can generate a profit from year 8 onwards.
- The production of beans represents a net loss, which can be offset by the net income of tea, pigs and poultry. Additionally, it is important to note that beans are largely used for own consumption and has a large contribution to food security of farmer households.





***The poverty line adjusted for purchasing power is estimated at USD 253/individual/year in Tanzania. For a farmer household consisting of 4 members (average HH size based on PDC collected), this equates to USD 1,013 per household annually. *The living income benchmark for a standard family of 4 equates to USD 3,689 per household annually.*
Sources: PDC data and IDH diversification data collection for Ikanga

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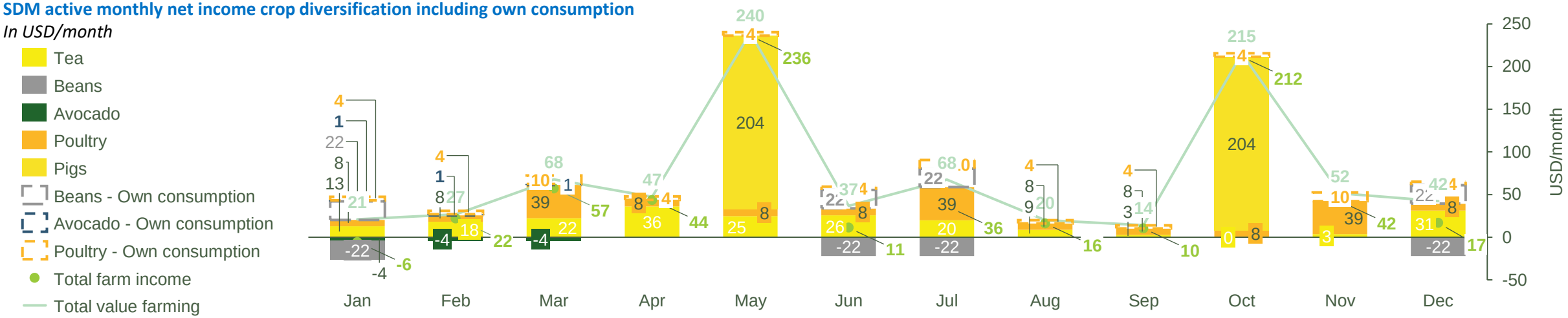
SDM active tea farmers could improve their food security and cashflow within the year through a combination of animal rearing, beans and avocado with tea

Improved food security for the SDM active farmer

- When looking at the different diversification scenarios, it is important to keep in mind a farmer's food security and monthly cash flow. It therefore might be more optimal to select a diversification strategy that is less profitable overall annually but that provides more stability throughout the year and has a high nutritional value, especially as 36% of SDM active farmers rely solely on food produced by themselves and 63% rely on a mix of own production and food bought in the market[1]. Therefore, it is critical to assess the value of produce farmers do not sell and use for own consumption.
- The combination of tea, beans, avocado and livestock was analyzed below in detail to demonstrate the monthly net income from sales and own consumption per crop and animal.
- In general, January and February are the months with most food insecurity, while cash flow challenges also occur between August and November. The presented diversification strategy could provide farmers with additional peaks in March, May, July, October and November, which could create a buffer for the months following. Additionally, the farmers can produce beans and avocado for own consumption throughout the whole year and from December to March.

SDM active monthly net income crop diversification including own consumption

In USD/month



Own consumption (unit)[2]	*Poultry*	eggs	eggs	1 chicken	eggs	eggs	eggs	1 chicken	eggs	eggs	eggs	1 chicken	eggs
	Beans	25kg					25kg	25kg					25kg
	Avocado	12kg	12kg	12kg									
Food Security[1]													

Note: this optimization has been developed for the SDM active farmer

Source: [1]PDC. [2]This data is from diversification data collection on production cycles of crops for Njombe farmers.

3. Annex

This section includes the following subchapters:

3.1 About the context (*About* **Tea** in **Tanzania)**

3.2 About **IKANGA**

3.3 About the farmers

3.4 Assumptions and methodology

3.1 About the context

Introducing the tea sector in Tanzania, its challenges and priorities

This section:

- *Describes the tea market and value chain in Tanzania*
- *Analyses the enabling environment and key sustainability risks*

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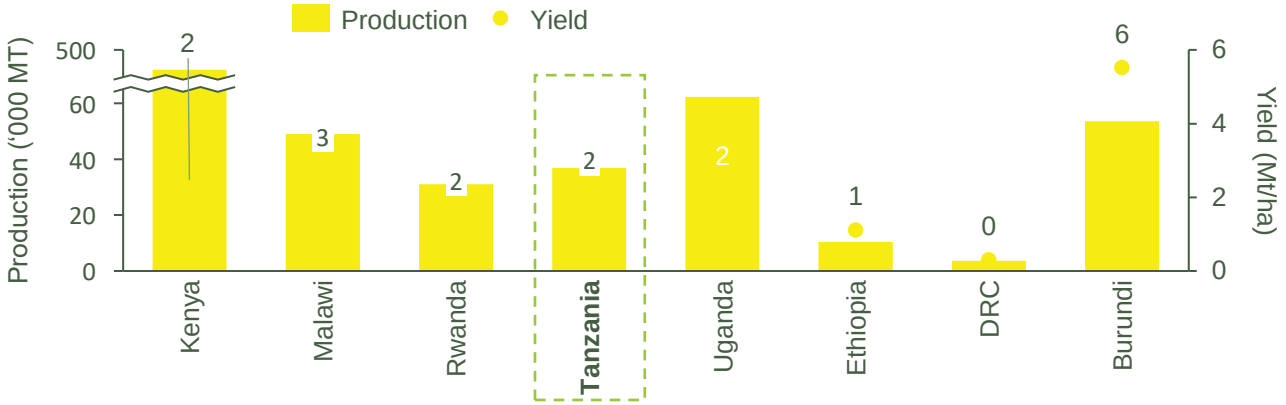
Tanzania has seen slow increase in tea production and yield over the last decade, which means there is room for improvement

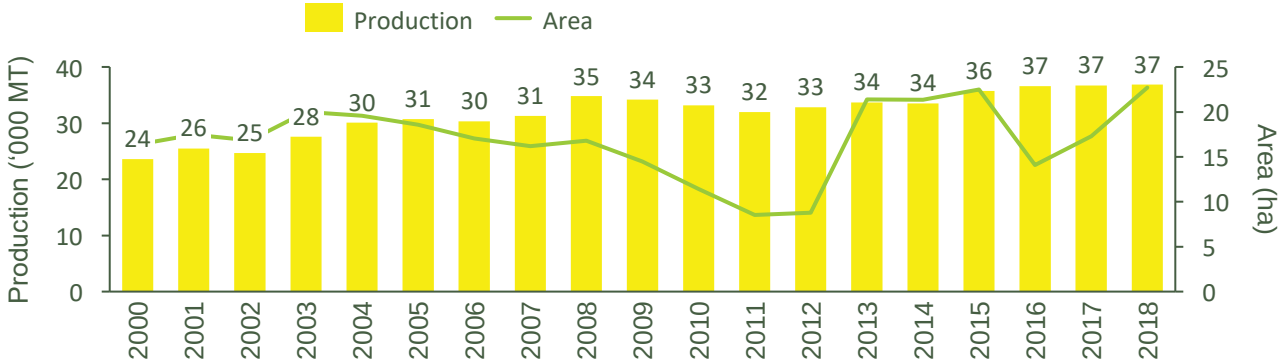
Made tea production by country (2018)[1]

Production in '000 MT and yield in MT per hectare in 2018



Domestic production of made tea[1]

Total production in '000 MT of made tea and production area



Production

- Among the tea producing countries in East Africa, Tanzania ranks fifth, as per 2018 statistics. The country's production has been rising steadily in the past two decades, from 24,000 MT in 2000 to 37,000 MT in 2018.
- However, the country's average yields are 40% lower than neighboring Kenya, largely due to the low productivity of smallholder farmers[5].
- Low productivity is mainly attributed to relatively lower altitudes compared to tea growing zones in Kenya, poor application of good agricultural practices (GAP), lack of extension services, lack of adequate and affordable inputs, amongst others. Therefore, there are opportunities to increase Tanzania's tea production.
- Tanzania has about 20,000 hectares of tea farmland[2]. However, available farmland cultivated by tea appears to follow a more volatile trend.
- In general, agricultural land in Tanzania is increasingly coming under pressure due to population pressure, land degradation and climate change. Additionally, the wide range of crops for which farmland often is suitable leads to crops competing for land[4].
- Studies indicate that the most effective solutions for improving productivity and incomes of tea farmers in Tanzania include encouraging participation of younger farmers, prioritizing extension services, expanding access to finance, strengthening tea associations, and improving access to markets that pay fair prices for higher quality tea[6]

Sources: [1]FAOSTAT (October 2020). [2]Theteadetective.com, Teas of Tanzania. [3]Committee on Commodity Problems, Report on the Tea Industry of Tanzania (2016). [4]Land for Agriculture in Tanzania: Challenges and Opportunities (2014). [5]SAGCOT. [6] Exploring factors affecting performance of smallholder tea farmers in Tanzania, (2017)

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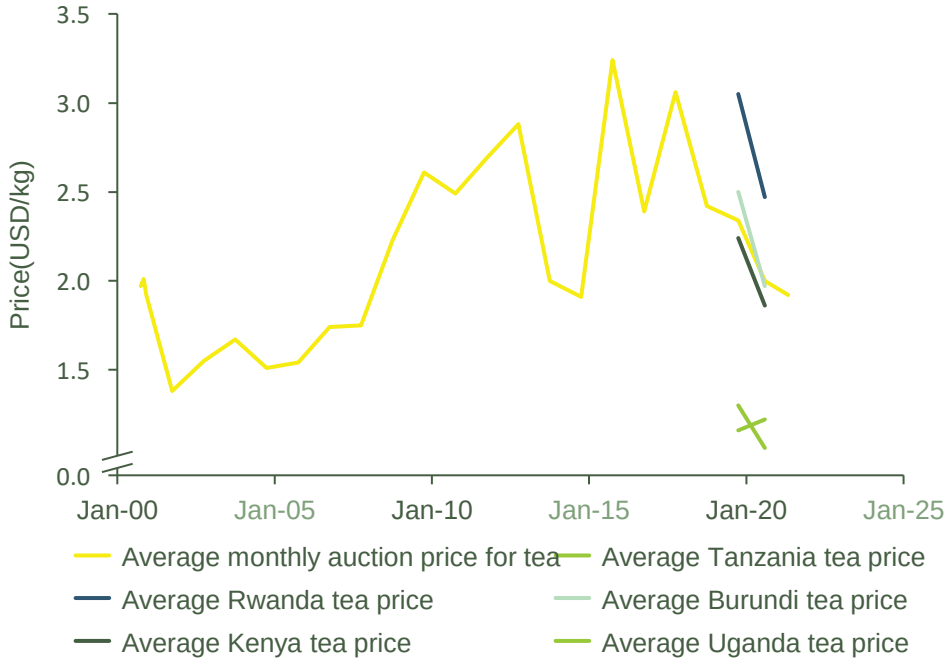
East Africa has had generally volatile tea prices, with Tanzanian tea capturing the lowest prices due to lower tea quality

Mombasa tea auction prices[1,2,4]

Made Tea price USD per kg over time



Sources: [1]Indexmundi. [2]TheEastAfrican: Rwandan tea price beats Kenyan at Mombasa auction on quality. [3]TheCitizen (2020) Start of tea auction in Dar. [4]NewVision(2020) Uganda fetches low price at Mombasa auction. [5]Value Chains and Chains of Values: Tracing Tanzanian Tea (2012)

Tanzania made tea prices

- Most of the East-African tea is auctioned at the Mombasa tea auction, making Kenya the leading tea exporter in the world[2]. More than three quarters of the produce traded comes from the country itself and the rest from its neighboring countries such as Rwanda, Tanzania, Uganda and Burundi.
- The historical Mombasa tea auction prices provide a good overview of African tea price fluctuations[1] and demonstrates a highly volatile nature, which impacts the rest of the value chain.
- Tea quality plays a vital role in determining the final value at auction. Although market forces may affect the general price levels, it is quality which distinguishes the value of tea across different factories irrespective of demand and supply patterns in the market[5]. Therefore, Rwandan tea often tends to capture the highest price of the teas offered due to its high quality. In 2019, Rwandan tea received 3.05USD/kg compared to a mere 1.3 USD/kg for Tanzanian tea[2].
- Due to the relatively low tea prices and the additional cost for Tanzanian tea aggregators to auction their tea in Kenya instead of in Tanzania, the Tanzanian government is planning to open their own tea auction house in Dar es Salaam[3].

Tanzania green leaf tea prices

- Each year the Tea Board of Tanzania (TBT) sets the green leaf tea price, based on an annual average from the Made Tea prices of tea processors, the green-leaf-to-made-tea conversion ratio and exchange rates.
- The determined green leaf tea price is the minimum tea price which can be paid to farmers selling their tea to processing factories and it usually constitutes a fair share price ratio of 37% of the tea auction prices. For Kenyan smallholder farmers, this ratio has been improving and is generally around 40-50%.
- Typically, tea price to the farmer consists of two parts:
    1. first payment is the minimum price set by the Government, based on average prices reported by processing factories; and
    2. second payment applies to companies which have sold and received a premium above the minimum price. TBT instructs this payment in order to meet the fair share price ratio of 37%.
- The price control by the TBT, unlike in other East African countries, was to force processing factories to pay farmers a fair price. This was necessitated by the very low prices that farmers received from private tea factories. Government envisions to discontinue the price control in the future.

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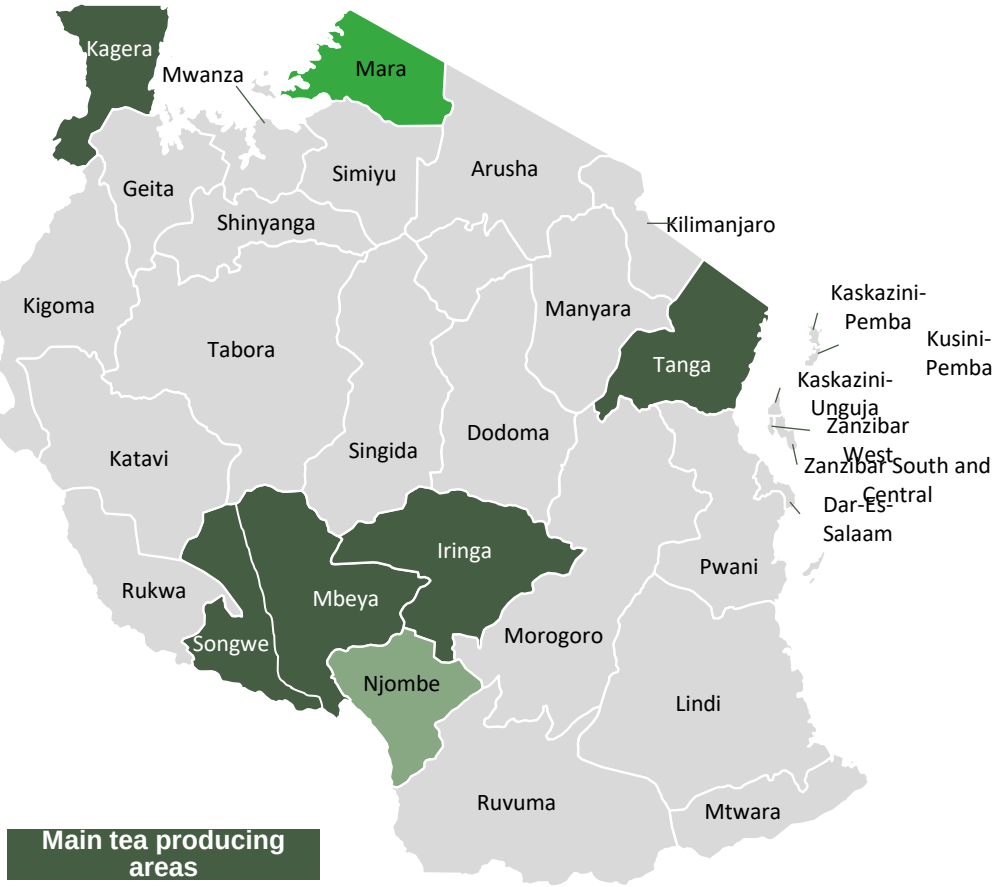
Tanzanian tea farmers are mainly located in the south and cultivate small, low-yielding plots while using little agrochemical inputs



Tanzania tea farmers are low-yielding

- Tea cultivation areas are geographically limited, as tea is a sensitive crop that requires specific growing conditions to thrive[3]. The Southern Highlands of Tanzania - Mufindi (Iringa), Njombe and Rungwe (Mbeya) - are the most significant tea-producing areas in this region[1].
- With around 30,000 smallholder farmers engaged in tea farming in Tanzania, tea is a key crop for smallholders[4].
- While smallholders account for almost half of the land allocated to tea[4], they only contribute to 32% of national production[5]. The other half of land consists of private estates who produce 68% of national tea production.
- The smallholder tea farmers struggle with low yields, averaging about 2,000 kg/acre. By comparison, average yield of private estates is 4,272/acre[2]. The main reason is their low use of farm inputs[6].

Tea farming in Njombe is losing out to competitors

- Despite having some of the best soils and climate in the region, Njombe has high rates of poverty: between 20-30% of the population here live below poverty line[7].
- Tea farming in Njombe has been relatively nascent and is mostly conducted on low-yielding small plots with limited extensions services.
- Tea production is rarely managed as an investable enterprise by smallholders in Njombe, and it frequently conflicts with the higher margin local crops such as avocado and potato[8] that can have 3-5X the gross margins of tea in the area.

Sources: [1]SAGCOT. [2]Woldbank (2004) Tanzania's tea sector constraints and challenges. [3]IISD (2019) Global market report: tea. [4]Theteadetective.com, Teas of Tanzania. [5]Committee on Commodity Problems, Report on the Tea Industry of Tanzania (2016). [6]LEI Wageningen: Baseline study of the Mufindi Outgrowers Project, Tanzania (2016). [7]TheEastAfrican: Tanzania targets five regions to boost tea yields and sales. [8] A new leaf: Transforming livelihoods through the Tea industry, NOSC (2020)

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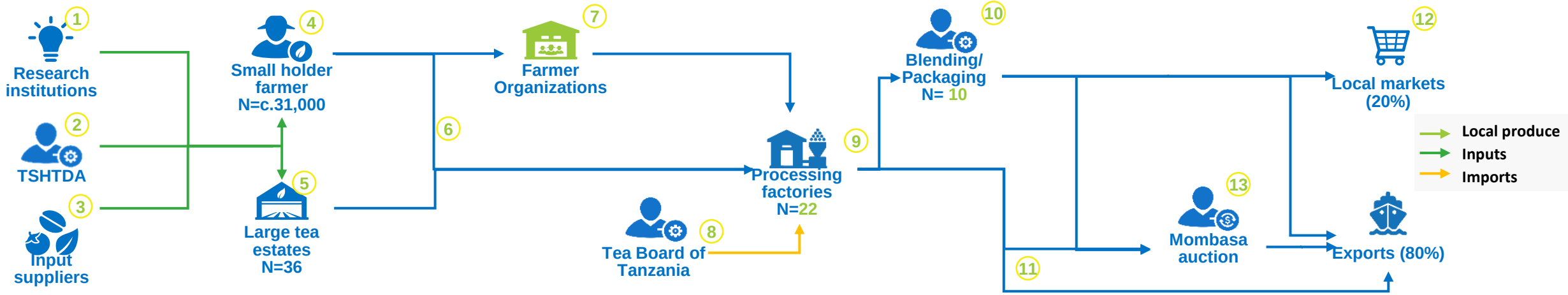
The Tanzania tea value chain is split between high-yielding, vertically integrated estates and low-yielding, low-earning smallholder farmers



Production

1. Research institutions such as the TRIT and TARI are leading the development and implementation of cloned tea seeds[6].
2. The Tanzania Smallholder Tea Development Agency (TSHTDA) provides high-quality seeds and extension services to other actors in the value chain such as farmers, farmer organizations and even processing factories[6].
3. High-quality inputs are often unavailable or unaffordable for the farmers[6].
4. Tea in Tanzania is cultivated by either smallholders farmers, on plots averaging less than one hectare with lower yields or by large estates[1].
5. Large tea estates often exceed 1,000 hectares and apply a combination of ingrower and outgrower farmer schemes[1,2].

Aggregation

6. Large scale tea estates are in control of their own aggregation while smallholder farmers are mostly members of a farmer organization which manages the aggregation and transport of picked tea leaves to the buyer and processor.
7. Tea farmers are often organized as associations or in non-registered groups for input provision and to improve their access to finance. Some tea growing regions have more well-organized farmer organisations than others.
8. The Tea Board of Tanzania regulates tea prices in the country and sets the minimum price payable by processing factories to smallholder farmers for their green leaf.

Processing

9. As picked leaves need to be processed within 6 hours, quick access to tea-processing facilities is key. Therefore, international tea manufacturers have established their own processing plants close to the fields, which has created a vertically integrated value chain[3].
10. Tanzania still counts relatively few blending factories as tea has historically been seen as an export crop. The increasing local interest in tea is seen as an opportunity in the blending market and a way to increase the focus on quality[6].

Markets

11. A significant amount of Tanzanian green leaf tea is sold outside of the auction through private contracts[5].
12. Although tea used to be seen as an export crop, the local market demand has increased to 20%[3].
13. Nearly two thirds of total Tanzanian made tea for export passes through the Mombasa tea auction[1] where market prices are fixed on a weekly basis. Afterwards, it might get repackaged and branded by Kenya so the tea looses the Tanzanian brand. This loss of value and the additional transport cost from Dar es Salaam to Mombasa has lead Tanzania to contemplate launching their own tea auction[4].

Source: [1]Woldbank (2004) Tanzania's tea sector constraints and challenges. [2]WUR (2015) Furthering sustainable tea in Tanzania. [3]IISD (2019) Global market report: tea. [4]TheCitizen (2020) Start of tea auction in Dar. [5]Value Chains and Chains of Values: Tracing Tanzanian Tea (2012). [6]Ikangainterviews

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Improving factory infrastructure, providing inputs on credit and support solutions to reduce labor shortages are key challenges for Ikanga

Risk *Neutral* *Opportunity*

Definition	Situation	Implication for SDM
Technology *Technology availability, research & development, delivery and adoption*	• Although ownership of mobile phones amongst SHF has increased in recent years, knowledge on the use of digital services, such as access to information on agronomics and to digital payments for transactions, remains very low.	• There is a clear opportunity to leverage digital tools for various use cases in Ikanga, including but not limited to ERP and farmer management systems. A cost-benefit exercise into these can help prioritize a few to pilot in the medium-long term.
Environment *Climate change, possibility of extreme weather, soil type, water supply and quality, pests and diseases. Potential environmental damages such as deforestation*	• Although Njombe district is highly suited for tea cultivation, climate change will affect rain patterns and increase incidence of extreme weather events in the future, such as droughts. • This will lead to lowered yields and farmer incomes, and could push even more farmers out of tea farming, affecting Ikanga's supply.	• Ikanga should start future-proofing its operations against climate-related risks. This can start with regular data collection in the short-term: on soil health, weather patterns, and eventually broaden to consider activities in the long-term around having a captive nursery, practicing regenerative agriculture, diversification, crop insurance, and other climate solutions.
Infrastructure *Existence and state of roads, water and electricity networks as well as proximity to main trading / processing hubs (e.g., access to market)*	• During rain season, road quality deteriorates and trucks carrying green leaf can get stuck. • Lack of an electricity back-up in the processing factory. Electricity outages in the processing factory can lead to major loss of income as sourced green leaf cannot be processed in time.	• Bad road infrastructure cannot not only lead to quality deterioration and post-harvest loss as picked leaves need to be processed within 6 hours to ensure quality[2], it also significantly increases transport costs of both green leaf and Made Tea. • Clearing any pending dues with local electricity supplier is key to smooth operations, as well as investing in power back-ups like diesel generators
Labor *Cultural norms that restrict /promote people of certain ages, genders or social groups from farm labor. Availability and cost of labor*	• Farm labor shortage due to competition among different value chains, especially during plucking as this activity is highly labor intensive and costly. • Due to the lack of available labor, farmers sometimes skip plucking rounds, leading to reduced quality of green leaf and lower yields	• Mechanization solutions will play a big role in bridging the labor gap on tea farms in the medium to long term. • It is important for Ikanga to evaluate and test smallholder-appropriate mechanical and automated technologies for plucking.
Inputs & Financing *Availability of affordable, quality inputs and the necessary marketing and distribution mechanisms. Availability of credit. Enabling regulatory environment*	• SHF' use few inputs due to weak seed production systems and input distribution infrastructure, and limited access to affordable credit[3]. • SHF represent high credit risks and their financial needs often extend beyond agricultural purposes[4]. Lack of collateral, credit history and offtake guarantee are some of the constraints to increasing supply of finance to farmers.	• There is a substantial unmet need for formal finance by farmers, which probably curtails their ability to invest in the improvement or expansion of their farms. • Ikanga should consider strengthening partnerships with local credit unions, micro-finance providers, and/or banks to increase supply of credit for new planned expansion of tea farming

Sources: [1]Enabling Environment survey. [2]IISD (2019) Global market report: tea. [3]GAFSP (2016) Agribusiness country diagnostic – Tanzania. [4]The Mastercard Foundation (2017) Responsible Agriculture Finance for Smallholder Farmers in Tanzania and Uganda.

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Addressing institutional instability is a key challenge for Ikanga, while unlocking female participation in the value chain and demonstrating the clear business case for tea cultivation are opportunities

Risk | *Neutral* | *Opportunity*

Definition	Situation	Implication on SDM
Trading System *Organization of the system through which crops are traded from farmer to market, including the number and type of actors involved*	• Tanzanian tea can be sold at the Mombasa auction, through local sales or direct contracts. The former is less favorable as it coincides with high logistics costs and little bargaining power of the seller, pushing down prices and reducing margins for SHF[2].	• Ikanga needs to find an optimal mix of sales to capture a higher price for Made Tea to enable the transfer of higher value of tea to its farmers. • Development of local and direct sales opportunities is important for Ikanga to realize a higher proportion of price (through better margins) and improve farmer payments.
Pricing & Competition *Market dynamics of the main crop of the SDM, including competition between buyers and possible price-setting by the government or other parties*	• The Tea board of Tanzania sets the minimum farm-gate price for green leaf tea. • The region has only two dominant factories: Ikanga and its competitor, both of which enter into annual purchase contracts with smallholders • Ikanga pays the minimum set farm-gate price to farmers, even if this means temporarily operating at a loss.	• Farmers are bound by contract to sell their quality tea to Ikanga, but since contracts are not legally enforced, farmers can side-sell to competitors • To counter competition, Ikanga needs to fix payment schedules with farmers, as well as tap into markets that give price premiums for quality that can be passed on to farmers as quality bonus.
Institutional Stability *Stable political environment, peace and security in farming areas*	• Many tea SHF in Njombe district remain independent while legislation obligates tea sourcing through formal farmer groups.	• All farmers will need to become formally organized in farmer groups to improve their own bargaining power and bring efficiencies for SDM. Pillar 1C expounds on a possible model for cooperatives that can be employed here
Land Tenure *Existence of land ownership rights / regulations and their enforcement. Ease of purchasing/ transferring land*	• Land title ownership is not an issue in Njombe district and land is easily available for SHF.	• Access to land is relatively easy for farmers as prices are low and land titles are easily obtained, this provides an opportunity for farmers intending to expand their tea farm or to start engaging in tea farming.
Social Norms *Availability and quality of schooling and healthcare. Cultural factors. Potential social externalities like child labor, gender disparity*	• No evidence of child labor in the region • Women are heavily involved in tea plucking; however, they have limited access to economic participation as few women own land or have decision-making power in the farm.	• Only ~15% of Ikanga's tea farmers are women, although they are very active members in training programs. This may require greater sensitivity while engaging with this minority group to encourage their participation and keep them loyal to the company.

Sources: [1]Enabling Environment survey. [2]IISD (2019) Global market report: tea

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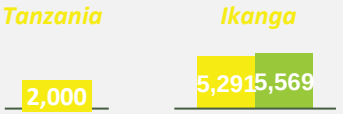
Women are highly involved in tea farming activities; however, they have less decision-making power and less access to finance to invest in their farms compared to men

Female Male

Farm profile

How does the yield of ***Ikanga***'s male and female farmers compare with the country average?

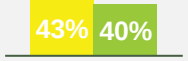


Total farm size (acre)	3	3
Tea farm size (acre)	1	1
Top 3 crops	Tea	Tea
	Maize	Maize
	Beans	Beans/ avocado

Farmer profile

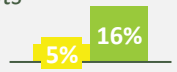
Labor activities (f = 35 , m = 180)	Crop maintenance	54%	48%
	Plucking	51%	39%
	Fertilizer application	26%	34%
Equipment usage (f = 35 , m = 180)	Hoe	63%	78%
	Machete	37%	48%
	Pruning knife	26%	43%
Input usage (f = 35 , m = 180)	Fertilizer	54%	58%
	Herbicide	34%	51%
	n/a	17%	13%

Experienced challenges purchasing inputs (%): (f = 18 , m = 157)



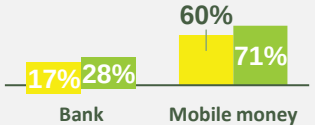
- *Lack of financial access and high prices are the key challenges reported in purchasing inputs*

Taken out a loan in the past year (%): (f = 35 , m = 180)



- *The common sources of financing for women are VSLAs then mobile money lending while for men they are micro finance institutions and non-profits/relatives*

Owner of a bank account or used a mobile money service in the past year (%): (f = 35 , m = 178)



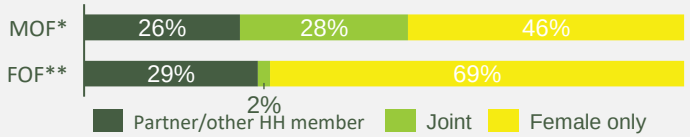
Household profile

Role division

	Female head of HH	Male head of HH
MOF*	0%	84%
FOF**	12%	4%

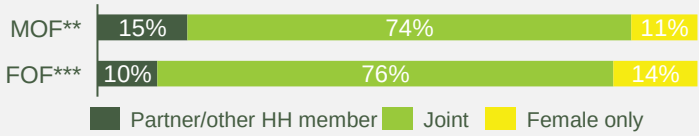
- Few women are in charge of managing the farm if they are not the head of the household themselves.

Decision making in household activities



- Women are mostly involved in activities such as cooking, cleaning, fetching water, washing clothes or buying food (86%). In both MOF and FOF, women have a disproportionate load of unpaid care work, giving them limited time to engage in productive activities and to attend training on GAP.
- In FOF, women independently make most decisions on household activities.

Decision making in farm activities



- Women are mainly involved in plucking (43%), and crop maintenance (23%).
- Most farm activities decisions are made jointly, however, in MOF men make more decisions by themselves.

*Male-operated farms **Female-operated farms

Sources: All data comes from farmer PDC except specified otherwise. 1) Tanzania Demographic and Health Survey (2015-2016), 2) World Bank (2017): Global Findex;

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Ikanga is gender unintentional and can still make great strides in working towards gender equality by investing in a gender strategy with KPIs

Female Male

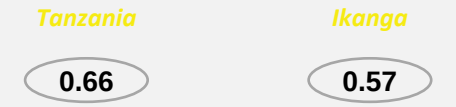
Risks and opportunities

Current situation

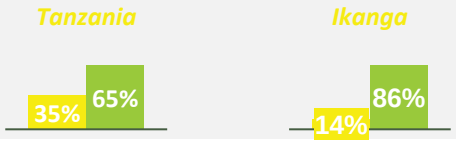
Overall employee ratio

Women in leadership positions

Income ratio (female/male)



Share of female and male farmers



Gender risks and opportunities

- Ikanga works with few female farmers and has a lower female employee ratio than the national level.
- Whilst Ikanga indicates that they are aware of the importance of gender equality but currently do not have a gender specific strategy. It is therefore more difficult to develop an approach to improve on gender KPIs.
- As tea farming involves many women, it is important to have this reflected in the organizational structure and policies to ensure their specific needs are addressed.
- Ikanga is considered gender unintentional.

Measures taken by Ikanga

Current measures and policies in place

- Ikanga collects farmer and employee data which is disaggregated by gender. However, it does not analyze this data to inform their services or company strategy.
- Ikanga does not have an internal written gender policy or KPIs.

Challenges and room for improvement

- Need for written gender strategy and KPIs.
- Need for implementing a measuring framework to understand the differences in production levels between male and female farmers.
- Need for understanding the specific needs of female tea farmers.
- Allocating staff time and resources to support development and execution of a gender strategy.
- A gender deep-dive is provided in the next slide to highlight some of the best practices that Ikanga can implement in order to become gender intentional, together with the benefits derived from these practices.

Sources: All data comes from farmer PDC except specified otherwise

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Ikanga and its farmers could benefit from a defined gender strategy that encompasses inclusive policies and services and which focuses on lifting key barriers to women economic empowerment

Best practices to implement to achieve gender intentionality

High priority – short term initiatives

1. **Write gender strategy for clarity on goals and agenda**. Establish KPIs (e.g., targets on the number of male and female farmers/ employees to be reached), develop a roadmap to get there and allocate resources to monitor and measure gender goals.

Medium priority – medium term initiatives

2. Use sex disaggregated data on needs and preferences of both men and women **to enhance productivity levels by designing the service model to reflect this.**
3. **Adapt service delivery** (such as training and input provision) to women's capacities, literacy rates, time schedules and location.
4. **Include financial literacy in training offered to farmers** (saving, budgeting, investment) to strengthen women's economic empowerment. Engender training methodology for both existing and new farmers.
5. **Support recruitment of women into farmer groups**. Foster women's leadership by encouraging the leaders of the women's groups to be lead farmers, particularly for poultry and pigs value chains.
6. **Develop a process of capturing, reporting and disseminating** generated **knowledge and learnings** on gender.

Benefits to Ikanga and its farmers

1. A **gender strategy** highlights the gender dynamics for Ikanga, the areas of focus and a framework to guide operations towards gender intentionality.
2. Tailored service delivery leads to **improved yields and quality of produce**[1].
3. Women's financial resilience is beneficial in household and community resilience and **fosters stable market and constant supply** chains[3].
4. Using existing women leaders to attract more women is an **effective farmer recruitment strategy.** In addition, Recruitment of women's groups is more likely to foster **higher loyalty levels** and **increased bankability[2] .**
5. **A demonstrated gender focus provides higher probability of attracting impact finance from investors with a gender focus.**

Barriers to be lifted

1. **Economic and social:** women's access and control of resources particularly finance is comparatively lower than that of men.
2. **Practical:** Critical in-house knowledge and experience in handling gender issues

1. Suri, T., Jack., W., (2016)., The long run poverty and gender impacts of mobile money; 2. IFC (2017)., Investing in women along agribusiness value chain; 3. Davies, M. Baars, M., (2017)., Link-up business case insights: Retrospective learnings from offering bank accounts to savings groups in Tanzania and Kenya; 4. Oxfam., (2016)., Women's Rights in the Cocoa Sector. Examples of emerging good practice

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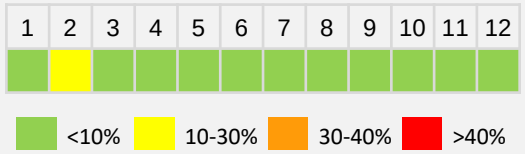
More than 80% of Njombe tea farmers are food secure, which is largely due to farmers dedicating on average 30-60% of their farm to food crop cultivation

Risks and opportunities

Current situation

Food security

17% of ikanga farmers expressed facing food shortages during the year, mostly in .



Assets

- **Average farm size:** 3 acres
- **Of which food crops:** 30-60%
- **Land ownership:** Farmers own land

Health & Sanitation

- **Prevalence of undernourishment:** Generally, malnutrition is high and 49% of children under 5 are stunted[2].
- **National average dietary energy supply adequacy:** 109%[1]

Food security risks and opportunities

- Few Njombe farmers face food insecurities as most grow all or most of their own food.
- However, if tea farming could provide farmers with a higher net income, then they would need to dedicate less of their farm towards growing food crops and increase tea cultivation.

Measures taken by *Ikanga*

Current measures and policies in place

- Ikanga considers food insecurity as risk for the farmers and recognizes the importance of diversification for the livelihoods of farmers.
- However, Ikanga does not currently consider it as a strategic goal, nor do they provide any support or services for diversification.

Challenges and room for improvement

- The low income from tea and overall net income from Njombe farmers poses a risk to Ikanga as other more financially attractive farming activities such as animal rearing or avocado cultivation could lead farmers away from tea.
- Need for Ikanga to support farmer livelihoods from tea, by offering them competitive farm-gate prices (or quality bonuses) and support them in investing in other activities such as pig rearing or poultry farming.

Sources: All data comes from farmer PDC except specified otherwise. [1]FAOSTAT (2015,2018).[2]UNICEF (2019) Tanzanian national nutrition survey.

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Changing rain patterns are a key threat to Njombe farmers as tea farming is 100% rain-fed

Climate risks exposure and impact

Risk exposure

Temperatures (change in) short- and long-term averages	Low	• Long-term temperatures are rising
Precipitation (change in) timeliness and availability	High	• Rains arrive increasingly late • Rainfall are more erratic
Climate extremes (change in) likelihood and severity of hail, floods, locusts, etc.	Medium	• Droughts and riverine floods are an issue in the region and are expected to worsen

Farmer resilience and impact

Farmer resilience

- Tea farmers in Njombe have little resilience against climate shocks as their overall net income is low.
- Most farmers diversify, however, mainly in food crops providing little room for bad or delayed harvests.
- 48% of Ikanga farmers find no way to manage climate risks, other farmers rely on cash/mobile money or assets/savings.

Impact

- Although Njombe farmers currently experience relatively little impact of climate change, the expected change in rain patterns is expected to affect the rain-fed tea production and increase the need for irrigation.

Measures taken by *Ikanga*

Adaptation measures and policies in place

Strategy, measures and policies

- Ikanga sees climate as a big risk to the yield and quality of tea, which would affect their own business and the livelihoods of the farmers.
- However, Ikanga has limited measures in place to adapt or mitigate the expected impact of climate change.

Intelligence

- Ikanga does not collect data on the impact of climate change on tea yield or quality.

Farm services

- Training on climate change and impact.
- Training on pruning and plucking timing to improve quality.
- Advice farmers on importance of trees to prevent soil erosion.

Challenges and room for improvement

- Need to build farmer resilience in relation to climate changes. This can be achieved through better access to information on weather patterns and tools for farmers to prepare accordingly.
- Need to provide drought-resistant and resilient tea seedlings.
- Need to provide support to farmers to enable investment in irrigation.
- Need to provide training on importance of income diversification in relation to climate change.

Sources: All data comes from farmer PDC except specified otherwise. Thinkhazard – Njombe region. Water Risk Atlas – njombe. Databasin - Njombe

3.2 About the SDM

Understanding the SDM’s strategy, business model and financial performance

This section:

- *Describes the current strategy of Ikanga*
- *Details proposed improvements as included in the main recommendations*
- Assessing the SDM’s financial performance and opportunities for improvement

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In order to improve its financial health and profitability, Ikanga needs to focus on enhancing operational efficiency and service delivery to farmers

Goals & Aspirations

- Growth aspirations for 2025:
  - ✓ Improve financial stability of business operations to pay farmers and support business investments
  - ✓ Increase green leaf tea production from 5,500 MT to 11,000 MT
  - ✓ Improve tea quality
  - ✓ Grow productivity and loyalty of existing ~2,800 farmers
  - ✓ Grow active farmer base to 6,000 farmers
  - ✓ Operate the factory at maximum utilization
  - ✓ Invest in a third processing line
- Contribute to farmer's livelihoods by fostering tea bush infilling, thereby increasing their tea yields and revenues
- Contribute to farmers' food security by supporting diversification

Where to Play

- **Financing**: Improve financial stability and management of business
- **Effective services:** Enhance service offerings (training, inputs, mechanization, seedlings) to improve yields and farmer incomes
- **Business development:** Improve price realization in the market through more direct and local sales, and buyers who offer quality premiums
- **Farmer institutions:** Support in the establishment and professionalization of cooperatives to improve farmer engagement and service delivery

How to Win

Points of differentiation

- Farmers have access to affordable quality inputs on credit and good trainings to guide application
- Farmers get access to mechanization services which bring down labor costs and improve net incomes
- Farmers are paid the minimum set farm-gate price on time and directly
- Gaps in fields are filled with high-yielding seedlings to improve yields per acre
- Ikanga strengthens relationships with key stakeholders such as government extension officers who provide support on GAP training and the tax authority to enable sustainable cashflows

Points of parity

- Maintaining a close relationship with farmers through extension officers to ensure farmer loyalty

Capabilities Required

Critical capabilities

- Sufficient staff skilled at agronomy, farmer engagement, and managing a new mechanization business
- Quality control function reinstated
- Affordable working capital financing to support the input credit scheme, and keep operations functioning smoothly through the year

Supporting capabilities

- Digital data management systems that integrate company operations and financials under one umbrella for improved business management and decision-making

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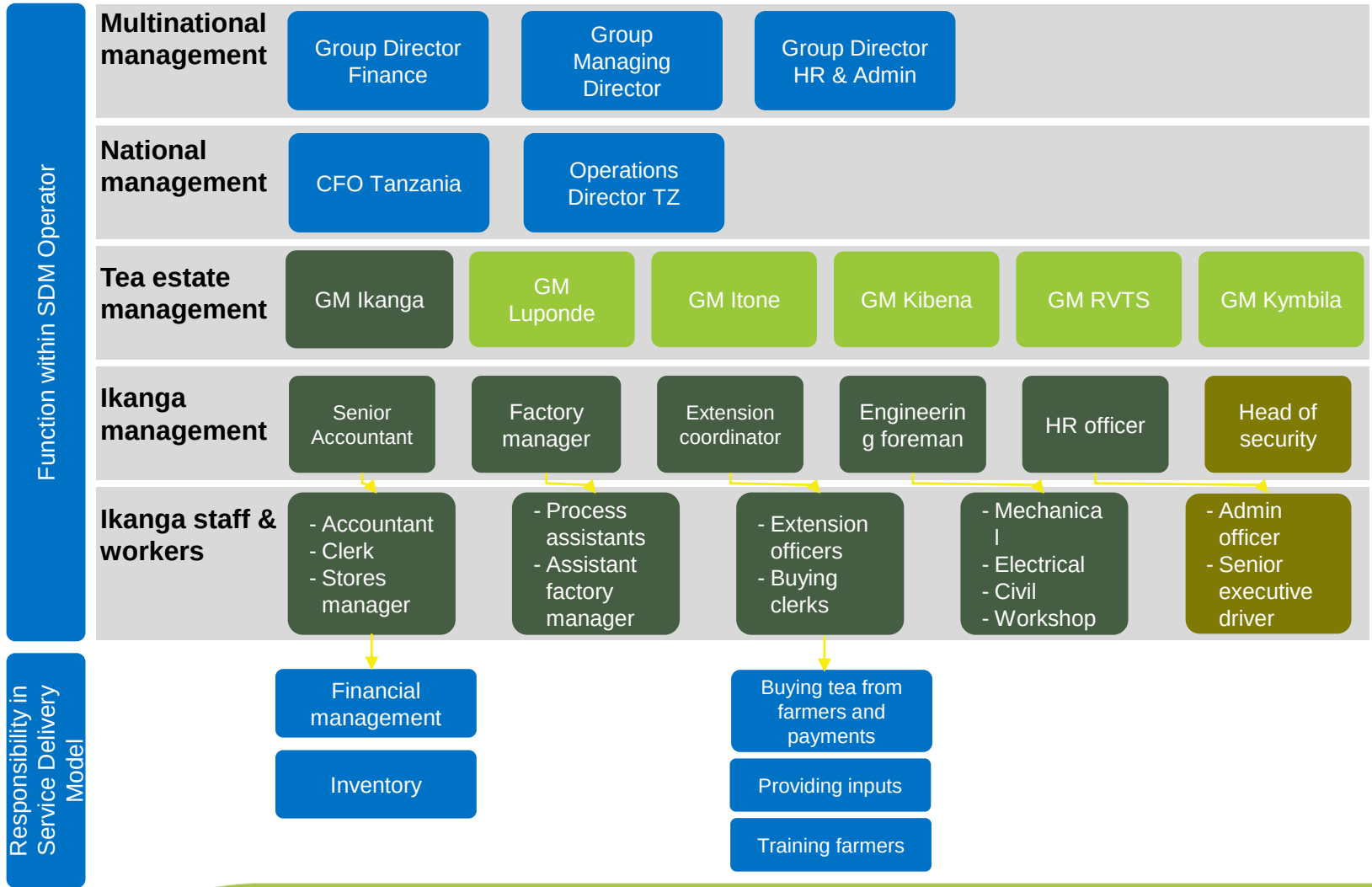
Ikanga has been fully integrated within the wider Group and has only recently obtained autonomy to conduct its affairs directly without full control by the Group



Organizational characteristics

- Currently, DL Group has five subsidiaries undertaking tea processing factories in Tanzania.
- The five subsidiaries operate six factories, namely: Ikanga, Luponde Tea and Itona tea estates (both under Mufindi Tea and Coffee limited), Kibena Tea Company Limited, Rift Valley Tea Solution(RVTS) and Kymbila.
- Of the five subsidiaries, only Ikanga (located in Njombe district) relies 100% on outgrowers for its green leaf supply.
- Ikanga factory has been in operations since 2013 but was purchased by DL Group in 2017.
- The teams are organized per factory within each company. Each factory is managed by the General Manager who oversees other department heads such as: finance, human resources, factory, engineering, security and field department.
- In total, there are 12 management staff in Ikanga as of June 2020 and 159 general staff including extension workers, factory staff, labor, engineering, and security.
- Of Ikanga's 12 management staff and 159 general staff, 2 and 55 are women, respectively.

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Ikanga's service delivery model has multiple prongs supported by a professional extension services team

Overhead (management, HR, legal, utilities, etc.)

Sourcing

Post-harvest services

- *Ikanga signs an annual contract with the farmers and guarantees the offtake of farmers' green leaf*
- *Farmers bring green leaf to 70 collection centers spread across villages for weighing and collection*
- *Ikanga uses digital weighing scales to ensure traceability of green leaf to the farmer and provide assurance to farmers of being paid for the correct volumes*
- *Ikanga's buying clerks inspect green leaf quality at these centers where it has installed digital weighing scales*
- *Payments are done through AMCOS in cash or directly to the farmers' bank account. However this system is not operating optimally at the moment*
- *Ikanga hires external logistics providers to transport green leaf from the collection centers to Ikanga's factory*
- *Ikanga performs a thorough quality check at the factory, after which it processes green leaf to made tea*
- *Ikanga also has a land bank of 234ha on which it planned to have its own estate and nursery to diversify sourcing. However, this is currently on hold*

Farm services

Training, organizational support & certification

- *Ikanga provides farmers with free extension services and group trainings on good agricultural practices (GAP), RA certification, bookkeeping, etc.*
- *Trainings are provided as per a training calendar through 3 company-operated demo plots, during village meetings, and additional sessions organized by tea ambassadors*
- *GAP training includes proper plucking, input application, pest management and post-harvest handling*

Inputs

- *Ikanga partners with input suppliers to provide farmers with high quality inputs on credit*
- *Ikanga provides both fertilizer and herbicides*
- *Ikanga provides inputs only to those farmers who have a history of supplying a stipulated amount of tea that can help them breakeven (1,000kg/year)*
- *The cost of fertilizer is settled against cost of tea supplied to Ikanga every month, and is deducted in monthly installments for up to 6 months*

Equipment & Labor

- *Ikanga provides equipment such as pruning knives to farmers free of cost*
- *Ikanga intends to offer mechanised harvesters to farmers in future*

Margin

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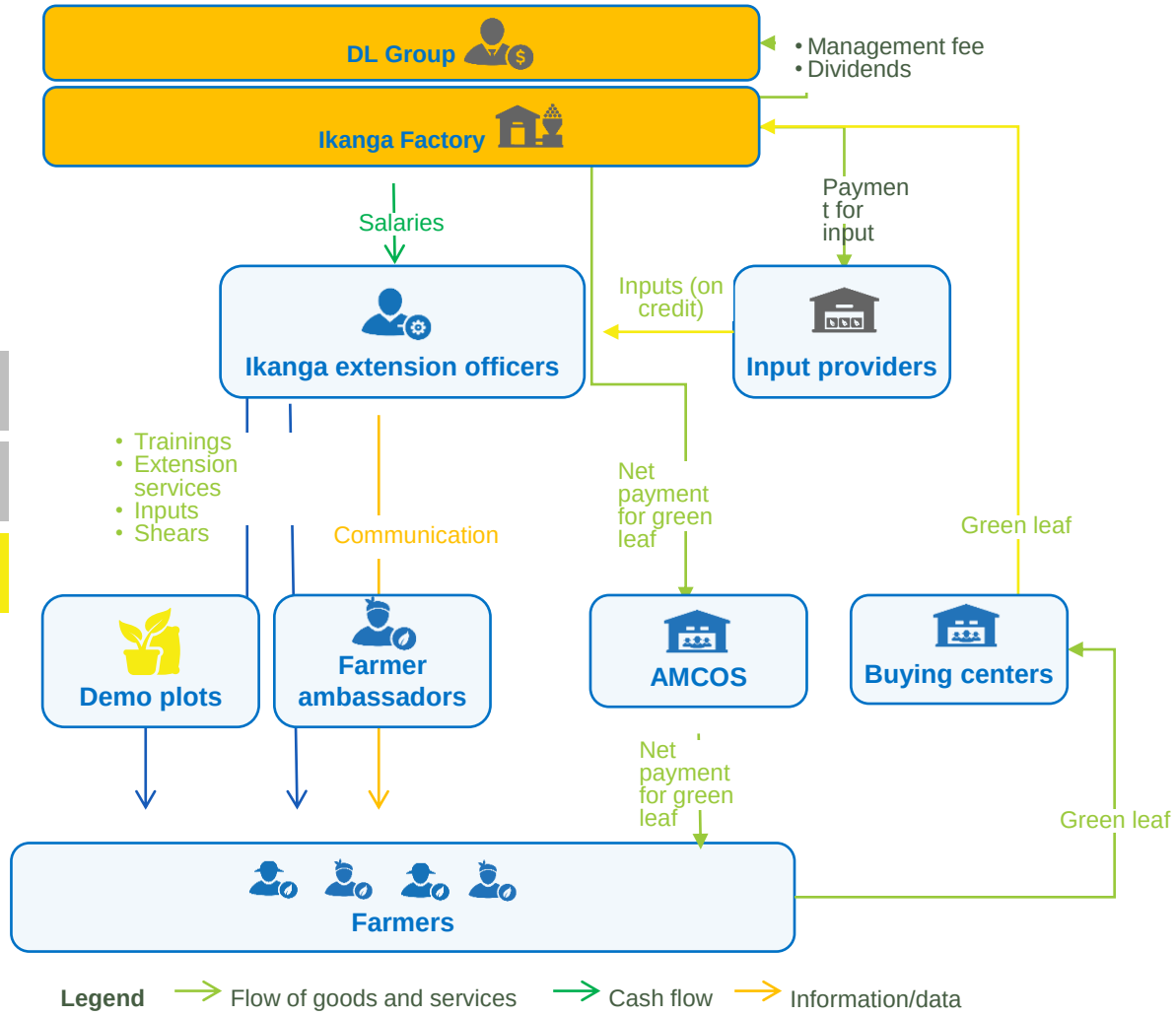
Ikanga's SDM model is focused on sourcing and input provision, but has scope for expanding the level of quality and number of services offered to farmers



Service delivery channels

- Ikanga generates revenues primarily through sales of processed tea leaves.
- It purchases this tea from ~2800 active farmers as of 2020, and with whom it has purchase contracts. It has the potential to work with another ~3000, who are currently dormant or working competition.
- The primary services it provides are extension services, inputs (fertilizer and herbicide), some tools and machines (pruning knives, applicators, etc.).
- Services are offered by extension officers that are distributed zone wise through village committees, farmer ambassadors, and demo plots.
- It deducts cost of inputs from the final sales settlement made against receipt of tea from farmers.
- For the next phase of the SDM, services will have to change to meet the key priorities of Ikanga which include helping farmers filling gaps in fields, retaining and increasing green leaf quality of existing farmers through improved services, and onboarding new farmers through an enhanced service delivery model.

Main challenges in service delivery

- Cashflow issues at Ikanga have led to untimely payment to farmers and a suspension of the input delivery scheme. This has been the main driver for poor yields, and low participation and loyalty of tea farmers to Ikanga.
- In addition, it has been facing high attrition of extension officers and currently only has 4 for all ~2,800 farmers, with the SDM is banking on government extension officers to supplement capacity.
- There is low/little digitalization of data collection or service delivery currently.
- The SDM relies on financing from the parent company, which can often deprioritize services and programs focused on smallholders. Hence, its important for Ikanga to increase financing received from external actors such as development finance institutions (DFIs) or donors to fund expansion or improvement of service delivery.

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Ikanga is lacking a stable and strong input provider partner, and will need to fill this gap before the next harvest cycle

Actors	Legal Status	Function (within this SDM)	Revenue model (within this SDM)	Incentive to participate (within this SDM)
DL Teas	Limited liability company	• Production, sourcing and processing of tea • Provision of services to farmers	• Sale of tea	• Create a secure and steady supply of quality green leaf • Meet demand for tea
Input providers	Limited liability companies	• Supply of agro-inputs (fertilizer and herbicides)	• Sale of inputs	• Expand customer base • Increase revenues
Tea Research Institute of Tanzania (TRIT)	Public Institution	• Research on best practices for farmers • Assessment of tea farmer needs • Supply of tea seedlings during Ikanga shortage	• None	• Catalyze the development of the tea value chain in Tanzania
Rainforest Alliance	Non-profit certification agency	• Setting operational and quality standards for tea production • Training companies and staff • Certification on produce	• Annual certification charges to member producers	• Increased sustainability of tea production
Tanzania Smallholders Tea Development Agency (TSHTDA)	Public institution	• Alignment of the Agri-Connect project with national smallholder tea strategy • Development of nurseries and provision of extension officers	• None	• Catalyze the development of the tea value chain in Tanzania

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Its relationships with AMCOS can be strengthened to improve service delivery and make them strategic partners in various farmer engagements

Actors	Legal Status	Function (within this SDM)	Revenue model (within this SDM)	Incentive to participate (within this SDM)
Tea Board of Tanzania (TBT)	Corporate body	• Coordination of tea pricing	• None	• Catalyze the development of the tea value chain in Tanzania
Government of Tanzania	Public institution	• Promoting (formation of) cooperatives and SACCOs • Development of infrastructure	• Taxes?	• Catalyze the development of the tea value chain in Tanzania
AMCOS	Savings unions/cooperatives	• Help collect and onward-distribute payments to farmers • Collect farmers savings into a savings scheme for onward lending for member needs	• Banking fees	• Enable farmer engagement with offtaker (Ikanga) • Earn revenue through possible service delivery to farmers and Ikanga
idh the sustainable trade initiative	Public-private partnership (global aims)	• Support on smallholder engagement (strategic, technical and convening) • Support of project M&E and capacity building of SDM	• None	• Improve farmer livelihoods and food security • Catalyze investments in smallholder value chains and sustainability projects

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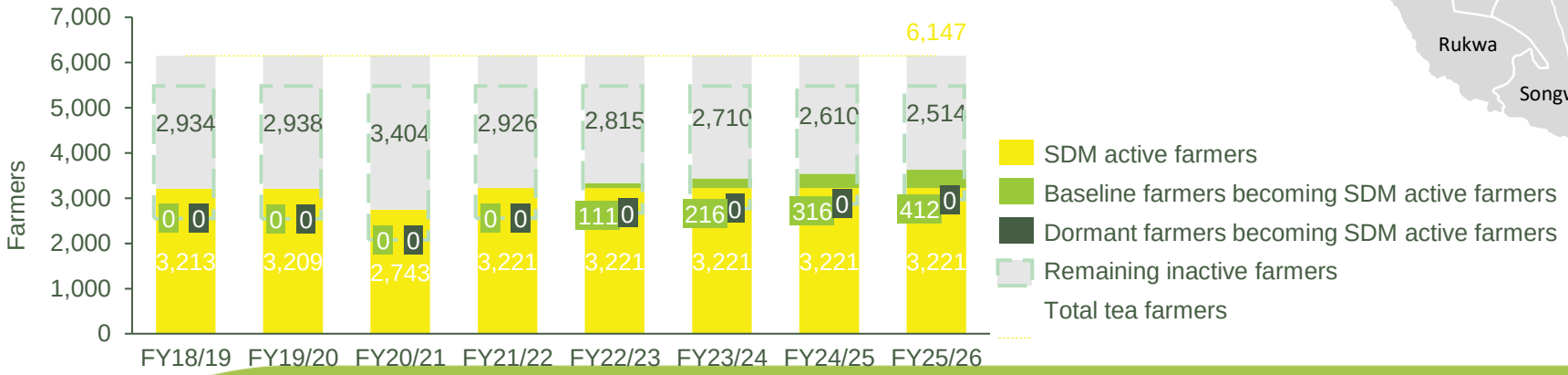
Ikanga can grow their active farmer base by providing a package of quality services to tea smallholders in Njombe

Ikanga's outgrower model

- Ikanga works with smallholder farmers in Njombe district, who have an average tea farm size of **1 acre.**
- Ikanga smallholders are located within an 18 km radius from the processing factory to ensure the quality of the Greenleaf.
- The company currently has a farmer base of 6,147 farmers, of which ~2,800 farmers are active. In the following five years, Ikanga will focus on increasing their active farmer base to reach a total of 3,633 through the provision of training and inputs by FY25/26.
- The outgrower program is currently run by 4 extension officers within Ikanga. Each extension officer should cover about 300 farmers, which is the local government recommended average, but currently due to under-capacity each officer has to cover an average of 600 farmers.
- Ikanga intends to increase the number of extension officers, but most of this capacity will come from additional government-appointed extension officers in the region.
- Ikanga is also looking to support farmers increase their food security by investing in growing beans, poultry, and pigs.

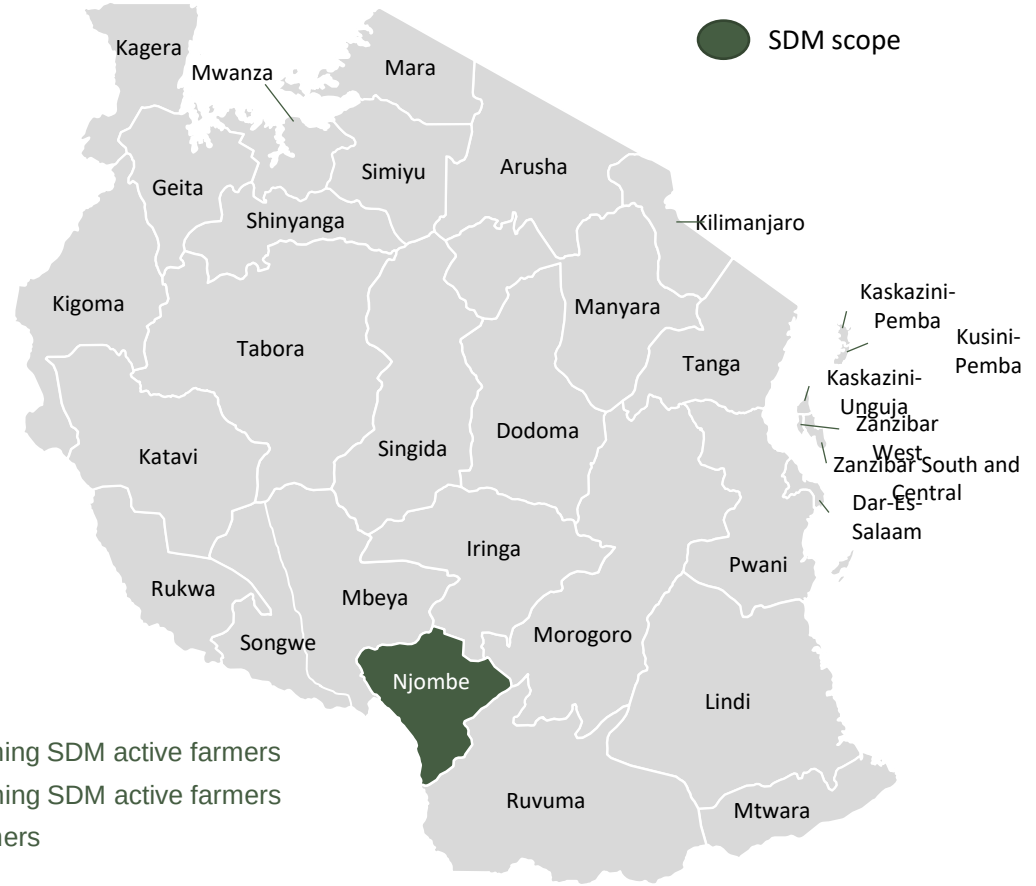
Ikanga farmer base

Projections of active and inactive farmers from FY18/19 to FY25/26



Location of current outgrowers

Tanzania



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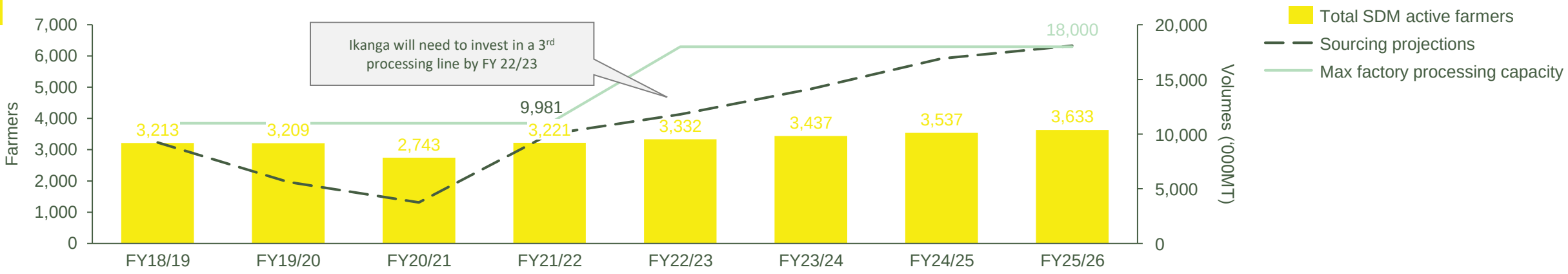
Increasing the active farmer base's productivity would enable Ikanga to source sufficient volumes to fully utilize three processing lines in their factory

- Ikanga, currently owns a processing factory with two processing lines with a total annual processing capacity of 11,000 MT green leaf (3,000-3,500 MT of Made Tea).
- However, Ikanga has only been able to source on average 5,800 MT of green leaf from smallholders over the past year, resulting into a final output of 1,200-1,300 MT processed made tea per year.
- This underutilization of the processing factory of 50%, has made Ikanga's main priority to increase the productivity of the active farmers from the current yields of 3,228kg/acre to 5,221kg/acre by investing in farmer training, fertilizer application and tea bush infilling. This would allow them to source volumes up to 11,000 MT of green leaf, which is sufficient for the factory.
- Ikanga's also plans to increase their active farmer base by converting Baseline and Dormant farmers to SDM active farmers. The combined projected increase in volume of green leaf over time due to the increased active farmer base and increased yields per farmer will create the need for Ikanga to invest in an additional third processing line by FY22/23, resulting in a total factory capacity of 18,000 MT green leaf annually.

Tea volumes

Projections of active farmers, volumes and processing capacity from FY18/19 to FY25/26



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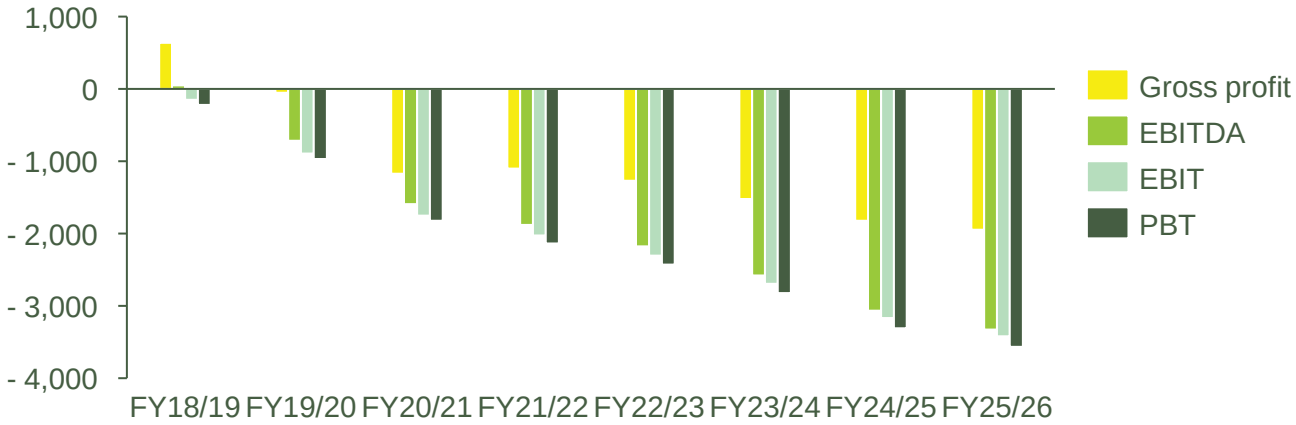
Providing mechanization services could be a profit-generating business for Ikanga, however it is not sufficient to balance out the loss made from processing made tea

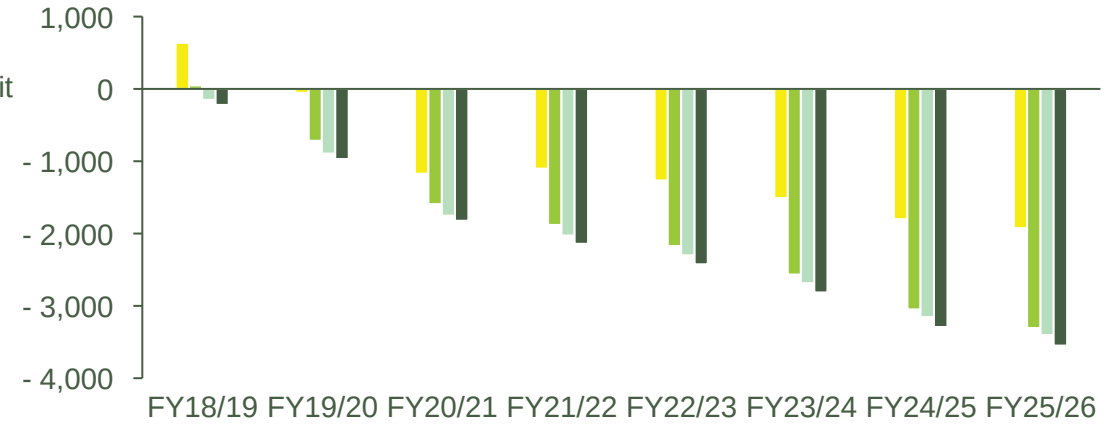
Profit & loss projections for Ikanga: scenario 1 (without mechanization)

Over time, in '000 USD/year



Profit & loss projections for Ikanga: scenario 2 (with mechanization)

Over time, in '000 USD/year



Margin projections for Ikanga: both scenarios

Over time, in %/year

Scenario 1	FY18/19	FY19/20	FY20/21	FY21/22	FY22/23	FY23/24	FY24/25	FY25/26
EBITDA margin	4%	-52%	-175%	-77%	-74%	-73%	-73%	-74%
PBT margin	-15%	-71%	-200%	-87%	-83%	-80%	-79%	-79%

Scenario 2	FY18/19	FY19/20	FY20/21	FY21/22	FY22/23	FY23/24	FY24/25	FY25/26
EBITDA margin	4%	-52%	-175%	-76%	-74%	-72%	-71%	-72%
PBT margin	-15%	-71%	-200%	-87%	-82%	-79%	-77%	-78%

Profitability of the SDM

- The upper graphs show different levels of profits for Ikanga's SDM, both under current operations (without mechanization) and with mechanization service provision (enabled by external financing).
- Although gross profit and EBITDA would increase slightly (0.1% and 0.6%) if Ikanga were to offer mechanization services, the profit generated by this service does not offset its loss-making business and Ikanga's overall long term profitability continues to deteriorate.
- The table shows that both EBITDA margin and PBT margin in the current scenario (without mechanization) are slightly lower (2% and 1%, respectively) compared to the mechanization scenario.

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The high processing cost of 1.55 USD/kg of made tea cannot be balanced out over time by the sales price, leading to a financially unsustainable business model

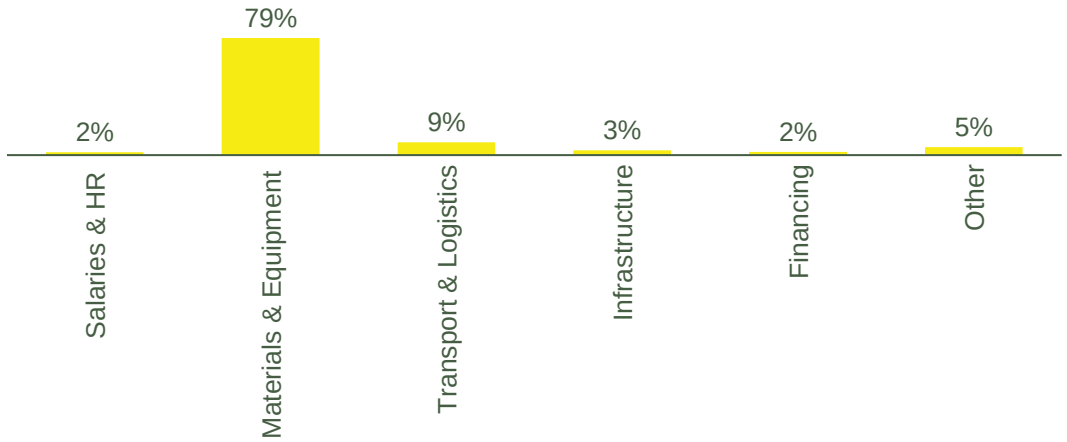
Overview of service profitability*

Annual averages in '000 USD during FY20/21 to FY25/26

Financial sustainability

- This SDM does not generate profits on any of the services provided: training and extension and input provision. This is because Ikanga does not charge farmers a fee for these services.
- Even sourcing will not generate a profit for the business over time as Ikanga's processing cost, averaging 1.55 USD/kg of made tea lies below the weighted average sales price for primary and secondary grade made tea of 1.08 USD/kg of made tea).
- The largest expense categories are cost of sales, which represents 79% of total costs (also represented under the category Materials & Equipment) and 148% of the margin.

Expense categories



* This represents the SDM scenario without provision of mechanization services

** Largest costs included in Overhead category include costs for repair and maintenance of assets, finance costs and HR costs not attributable to a particular other category

*** Largest costs included in Sourcing category include cost of sales and the depreciation cost to account for the purchase of assets.

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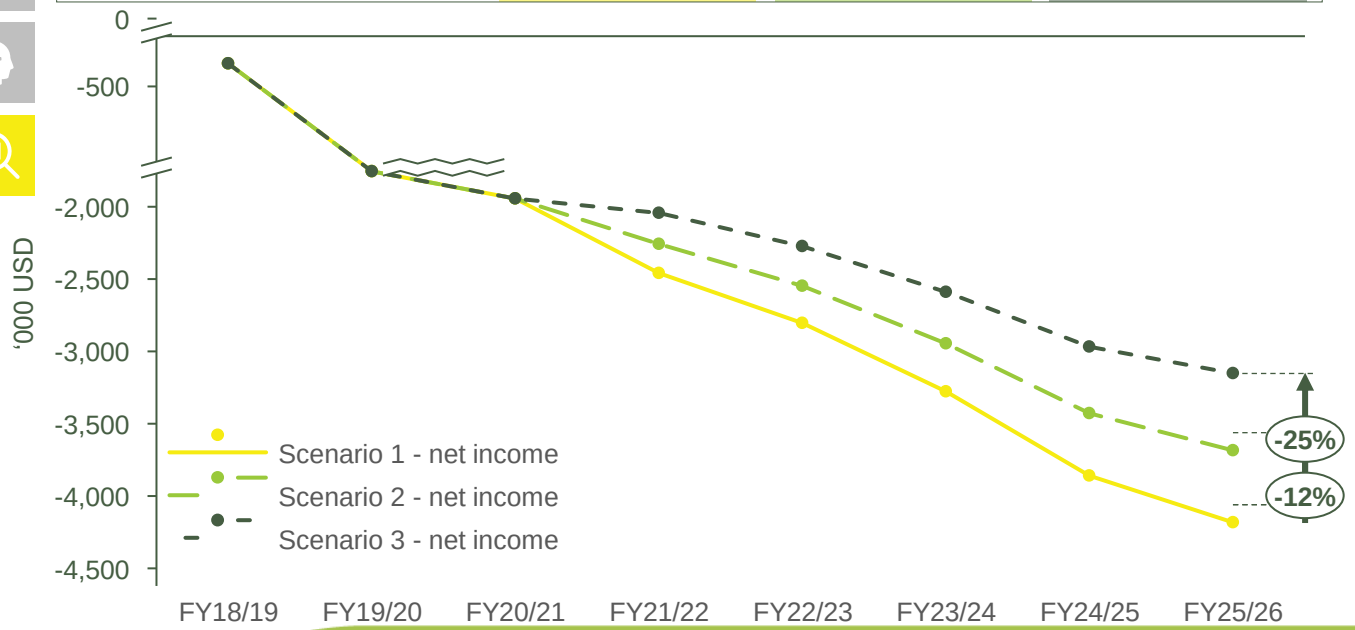
By optimizing their different sales channels, Ikanga could reduce their overall cost and increase net result by 12-25% over time

Scenario analysis: Impact of sales channels on net profit over time

Net income and cumulative net income over time in USD/year

	Scenario 1 Pre-covid 19	Scenario 2 Go direct	Scenario 3 Go local
Mombasa auction	95%	0%	5%
Direct export sales	35%	60%	5%
Local sales	5%	35%	60%



Impact of sales channels

- When exploring the impact of focusing on different sales channels, we assumed the % of volumes sold as listed in the table aside to be considered indicative, not prescriptive.
- The line graph shows how the net income of Ikanga is positively impacted by redirecting sales of made tea from the auction in Mombasa towards direct or local sales in Tanzania. This is due to the decrease in border chargers, levies for goods sold and cost for warehousing in Mombasa when opting to not sell the made tea at the auction.
- A switch for Ikanga from the pre-Covid 19 scenario to 'Go direct' would lead to a decrease in losses by 12% and a move to local sales could lead to a decrease in losses by 25%.
- Over time, the impact becomes stronger as Ikanga is projecting to increase their total made tea production and sales.

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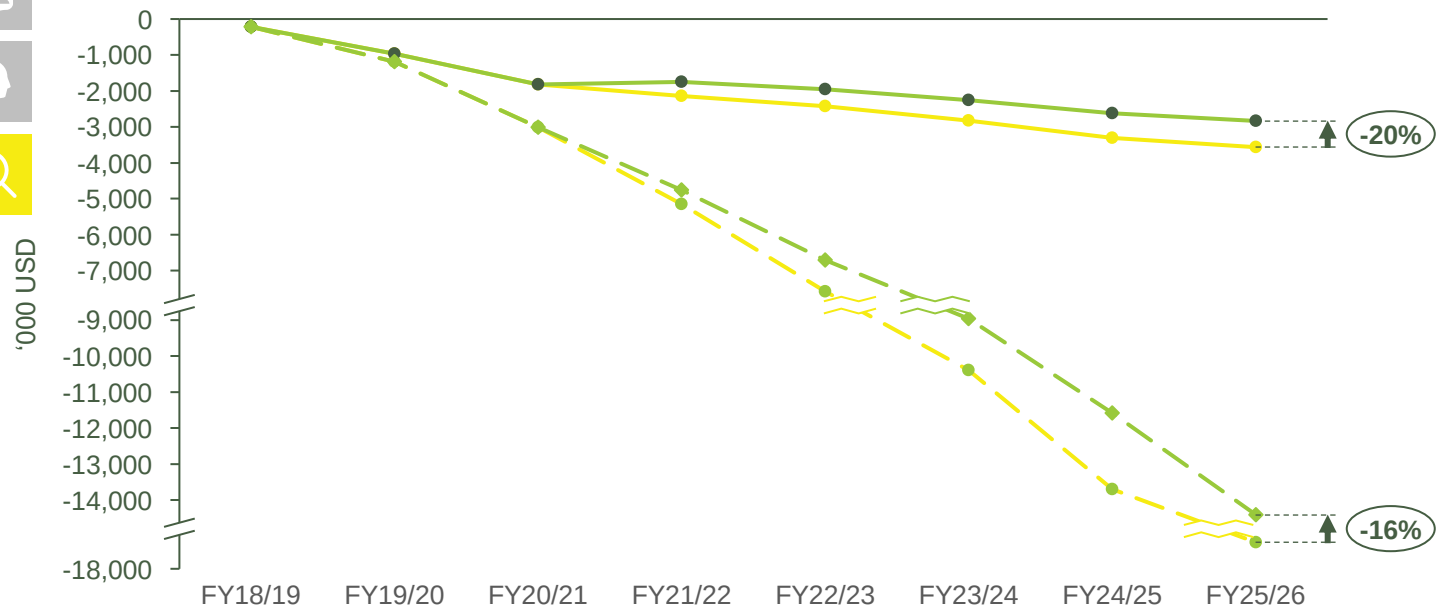
With a price improvement of primary grade tea from USD 1.18/kg to USD 1.40/kg, Ikanga's net profit only improves by 20%

Scenario analysis: Impact of sales channels on net profit over time

Net income and cumulative net income over time in USD/year

	Scenario 1 (Base case)	Scenario 2 (Upside case)
Purchase price of made tea (primary grade	USD 1.18/kg	USD 1.40/kg
Purchase price of made tea (primary grade	USD 0.69/kg	USD 0.70/kg



Impact of increasing price of made tea

- Scenario 1 (base case) represents the current prices that Ikanga is currently fetching for its made tea. Ikanga has made a budget with a more optimistic position of an improved price of primary grade tea to USD 1.40/kg and USD 0.7/kg for secondary grade. This represents scenario 2 (upside case).
- Whilst the upside case reflects an improved annual net income position by 20%, this improved price does not bring Ikanga to break-even, since the unit cost of production is still maintained at the forecast level of USD 1.55/kg.
- The cumulative net income position in year 2025/26 also show a corresponding improvement of 16%.

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Ikanga will need to pursue opportunities to improve service delivery while selling to new premium markets and fixing problems arising from poor cash flows in the business

	Helpful	Harmful
Internal	**Strengths** • Ikanga has a strong management team and experienced extension officers with the right technical know-how on agronomy practices • Strong commitment to sourcing from smallholders and improving their productivity and incomes in the process • Loyal and consistent relationship with ~2,800 local smallholder farmers • Provision of inputs and herbicides to farmers to maintain yields • Planned new factory line which can expand production volumes, expand sourcing from smallholder and supply to new markets • Successful Rainforest Alliance certification that has enabled the roll-out of digital weighing scales with higher accuracy	**Weaknesses** • Due to consistently low sourcing volumes and poor sale prices, Ikanga has little working capital to pay farmers or reserves to invest in improving operations • Ikanga relies heavily on financing from parent company which has no prioritised funding for the SDM: overall Ikanga appears to be underfunded as a business • Current processing facility is operating at ~50% of its capacity due to irregular supply of tea as well as maintenance issues, resulting in losses • Problems with cashflows resulting in late payments to farmers which are affecting the reputation of the company and farmer loyalty • High attrition of extension officers leading to suboptimal engagement with farmers
External	**Opportunities** • Local sales and direct sales to companies offer new growth avenues with better margins, attributed to lower selling and distribution costs compare to Mombasa auction • Crop diversification and harvesting services can be new service lines to farmers which help improve incomes and loyalty • Rejuvenating abandoned plots and improving planting density can increase production and supply of team to Ikanga significantly • Rise of digital farmer engagement and payment platforms that can increase the reach of Ikanga's extension officers • Government legislation mandating tea factories to source from cooperatives, encouraging greater engagement between Ikanga and farmer organisation	**Threats** • Change in rain patterns and rainfall quantities due to climate change could lead to decreasing yield and change soil health in the long-term • Competing tea factory in Lupembe that offers higher prices to farmers in the short-term, encouraging farmers to side-sell their tea • Relatively small tea farms and competition from other crops, making it difficult to achieve economies of scale and invest in technological upgrades • Attractiveness of other competing crops like avocado which farmers want to adopt instead of tea; possible resource diversion into these new crops • Consistent underpayment to farmers may eventually force them out of tea farming altogether

3.3 About the farmers

Assessing farmer impact and opportunities for improvement

This section:

- *Shows the farmer income statement across the various segments and over time*
- *Presents farmer cash flows across the various segments*
- *Outlines the profile and drivers of living income for a typical farmer*

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Assuming a static position, Baseline and Dormant farmers earn a higher net income from tea than SDM active farmers, due to the latter incurring higher input prices and a lower farm-gate price

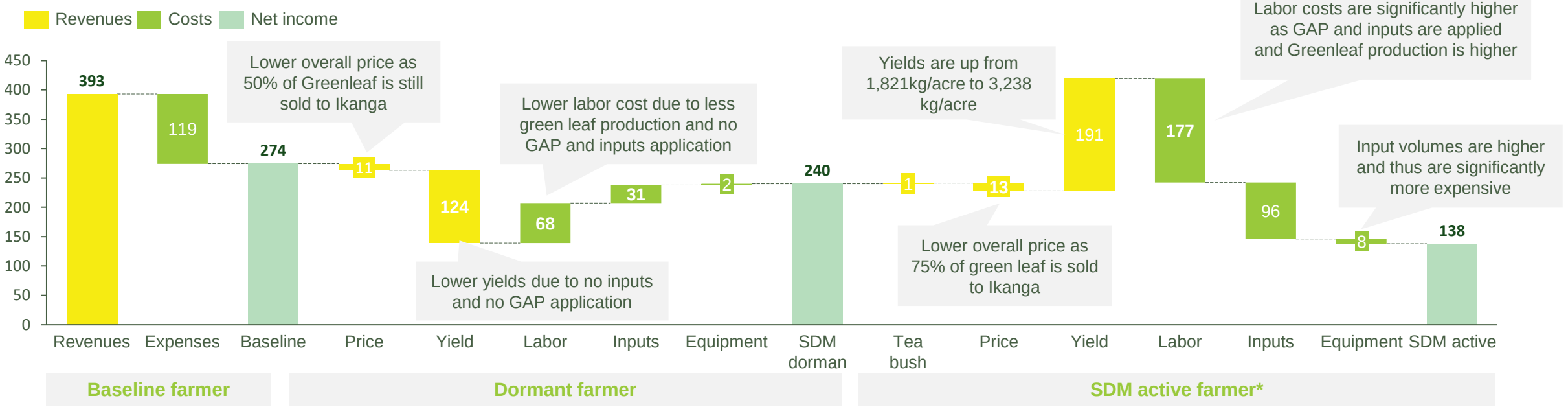
Comparing year 2 net income of an SDM active farmer with the net income of a Baseline and Dormant farmer shows that SDM active farmers currently earn significantly less. The reasons for this are three-fold:

- Baseline and Dormant farmers sell (most or all of) their Greenleaf to a competitor at TZS 350/kg compared to TZS 314/kg for SDM active farmers;
- Dormant farmers do not apply agro-inputs such as fertilizer and herbicides, resulting in both lower input and labor costs; and,
- Baseline farmers and Dormant farmers do not apply GAP, prune less frequent and have lower green leaf production, resulting in lower labor costs.

At the same time, SDM active farmers have a much higher starting yield and a slightly higher tea bush density. However these does not offset the difference in costs and farm-gate price. This highlights the need for support in further increasing yield per bush and bush density over time top optimize farmer's net income which is demonstrated in the next slide.

Comparing tea net incomes of Baseline, Dormant farmers and SDM active farmers

Split by revenue and expenses drivers, in USD/year (year 2)



**Note: the net income shown for the SDM active farmer represents year 2 in the SDM active farmer P&L over time (slide 62), as for modelling purposes year 1 is set equal with FY20/21 and Ikanga was temporarily not providing inputs on credit. Year 2 in the SDM active farm P&L does include the input cost as per SDM model service provision.*

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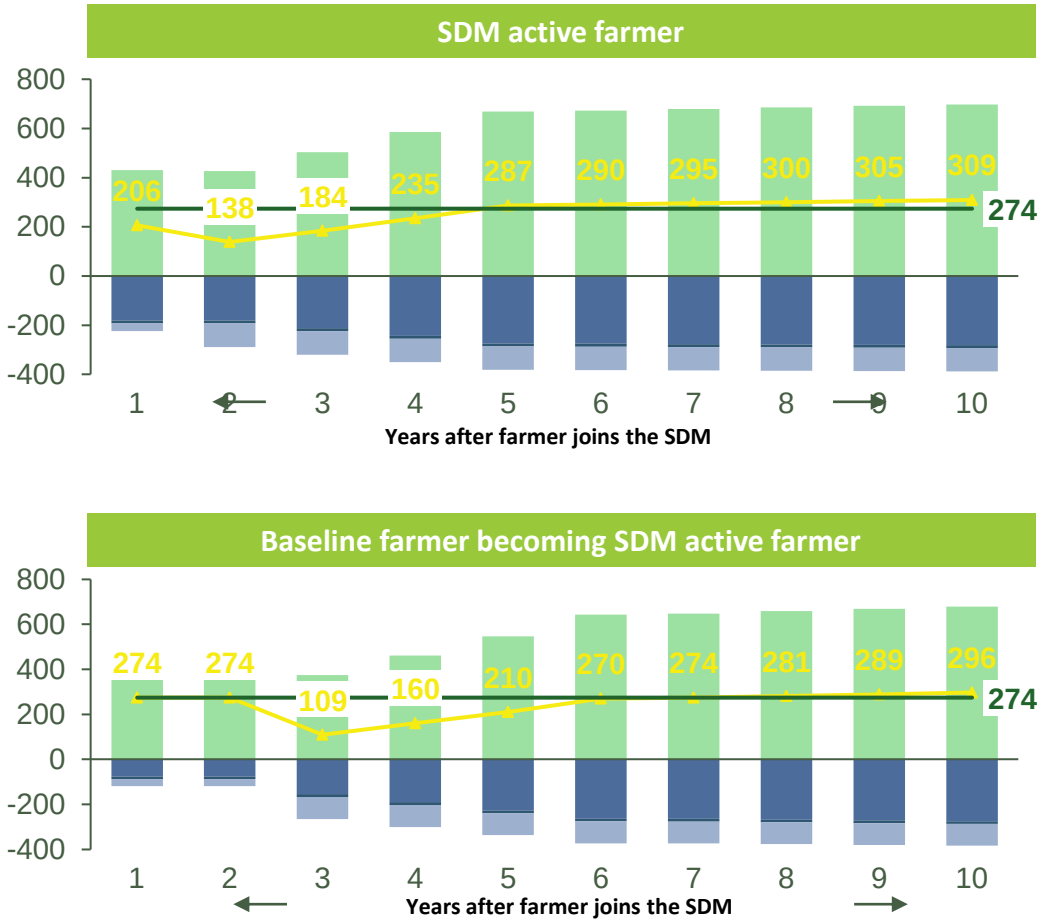
The higher costs and lower farm-gate price can be offset over time in Ikanga's service delivery model if the expected overall production increase can be realised

Comparing tea net incomes of baseline and SDM farmers

Split by revenue and expenses drivers, in USD/acre/year



Profitability over time

- The 10-year development of net income of an SDM active farmer over time for 1 acre tea plot shows a positive impact from participating in Ikanga's SDM, as income increases from 206 to 309 USD by year 10, which brings the SDM active farmers net income to above the static Baseline net income.
- Ikanga's provision of GAP training and agro-inputs allow SDM active farmers to increase their yields up to 1.3kg green leaf per bush and reduce their post-harvest loss ratio to 2%, thereby increasing their overall green leaf production. This should also lead to an improvement of green leaf quality produced by SDM active farmers, resulting in a key benefit for Ikanga.
- Over time, SDM active farmers can generate a higher net income than a Baseline or Dormant farmer by offsetting the higher cost and lower fetched farm-gate price of TZS 314/kg Greenleaf with the higher overall yield per acre.
- Baseline and Dormant farmers who converge to becoming an SDM active farmer are expected to experience a drop in income in the short term due to the decrease in farm-gate price and higher expected costs related to GAP and application of the recommended quantities of high-quality inputs.
- After 7-8 years, the switch to becoming an SDM active farmer would become profitable.

Note: This farmer P&L is projected over ten years as Tea is a tree crop and the impact of infilling and increasing yields is only demonstrated after several years.

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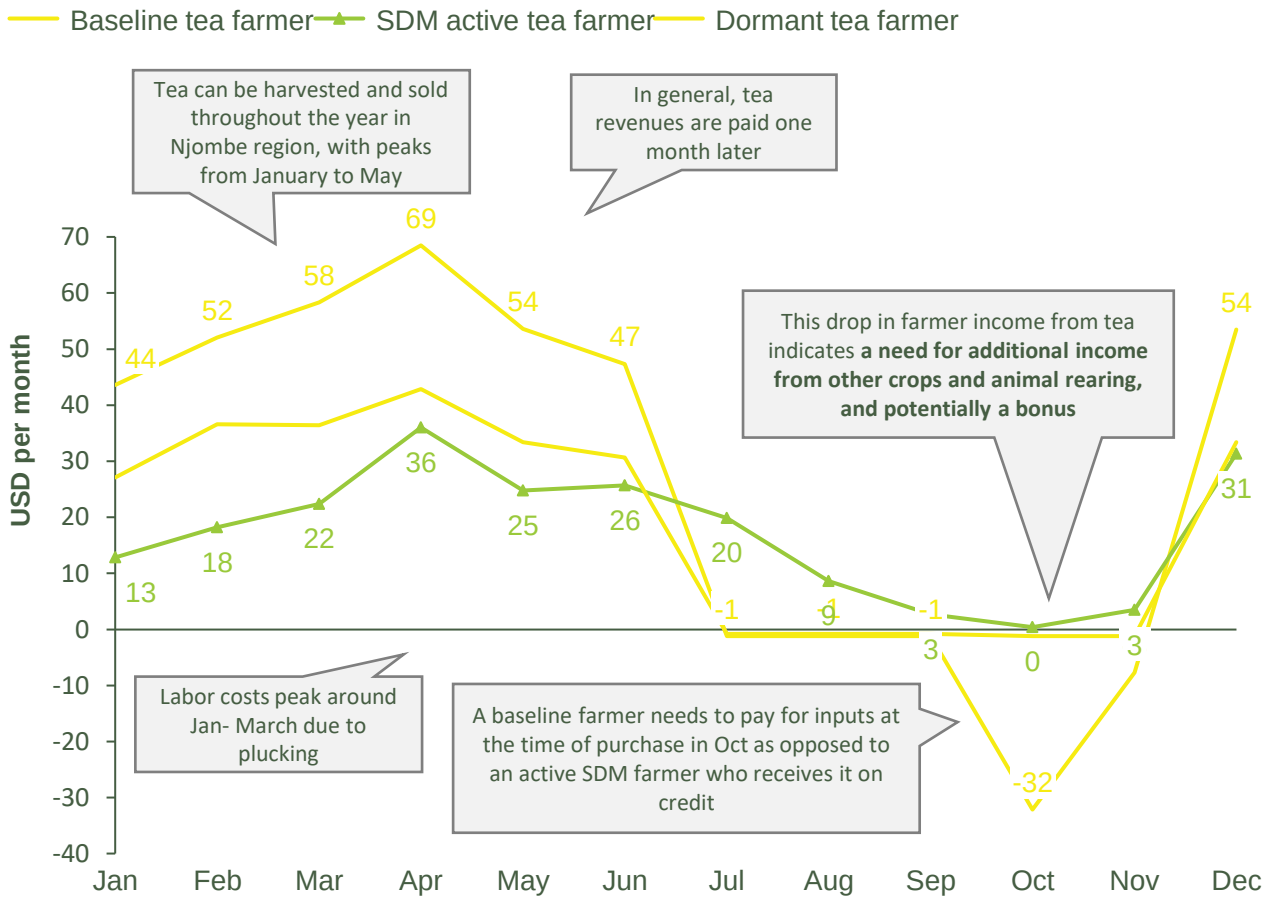
As a result of Ikanga providing training and high-quality inputs on credit, tea farmers can generate stable incomes throughout the year

Comparing tea cash flows of Baseline, Dormant and SDM active farmers

Cumulative in USD/month



Smoothening unstable tea income

- The climatic conditions in Njombe allow tea farmers to pluck all-year-round and have the potential to create a stable, albeit low, cashflow as farmers receive monthly payments for the green leaf sold.
- SDM active farmers who properly apply GAP are able to stabilize their cashflow by conducting the recommended rounds of plucking. Their green leaf production peaks between January to March and is lowest between July and September. Most farmers who do not receive training however, only pluck green leaf between December and June.
- Additionally, the SDM active farmers have access to agro-inputs on credit from Ikanga. Therefore, they do not incur a negative cashflow in October – like the Baseline farmers – but are able to deduct it from their tea revenues and even spread it over several months (4-6 months in general). Dormant farmers on the other hand purchase and apply no agro-inputs, and therefore do not experience a deficit in the month October.
- Although SDM active farmers have higher yields, their overall cashflow is lower compared to Baseline and Dormant farmers. This is due to the lower price fetched for tea and the higher cost for high-quality inputs. The increased yield of SDM active farmers is due to training, good high-quality inputs and infilling, which allows them to produce more green leaf overall.
- The cashflows for Baseline and Dormant farmers follow the same pattern, although Baseline farmers have a higher cashflow than Dormant farmers. This is due to Dormant farmers not applying GAP or inputs, resulting in lower yields.
- The graph demonstrates a need for tea farmers to substitute their tea income with income from other crops and indicates the ideal time for Ikanga to provide a quality bonus to accommodate for the annual drop in tea income.

[1] Note: we, which ere not able to obtain cash-flow assumptions from interviews with farmers, so these numbers potentially exclude some significant annual expenses, like school fees. They also do not account for unexpected off-farm expenses like medical costs, weddings, funerals etc. The assumptions were obtained from BNL field staff who are expected to have a good understanding of farmer cash-flows, and stress-tested against literature where available.

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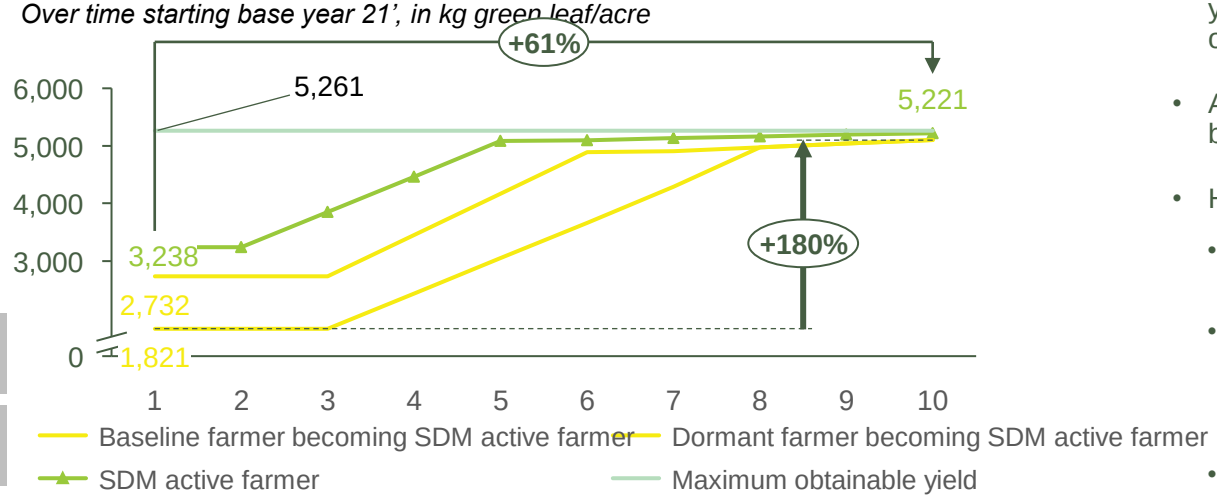
Provision of quality agro-inputs and tea bush infilling can serve as the most effective levers to improve farmer yields over time

Comparing yields of Baseline and Dormant farmers becoming SDM active farmers and SDM active farmers

Over time starting base year 21', in kg green leaf/acre



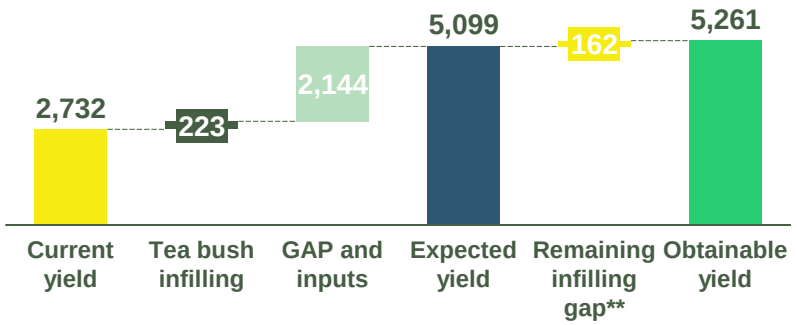
Differences in yield between segments

- SDM active farmers produce a much higher starting yield than baseline or dormant farmers in year 1 (3,238 kg GL/acre vs 2,732 and 1,821). This is due to the application of limited amounts of agro-inputs and GAP in the past.
- At the same time, SDM active farmers have a slightly higher tea bush density compared to baseline or dormant farmers in year 1 (average 3,856 vs average 3,707)*.
- However, the key drivers to increase productivity of all the three segments are similar:
  - Tea farmers will benefit most from services that increase their yield per bush such as GAP training and access to high-quality and the correct volumes of fertilizers and herbicides.
  - They will also benefit over time from infilling tea bushes to reach the recommended tea bush density of 4,000 tea bushes per acre. However, this is a gradual process as infilling with high-quality tea bushes is a costly investment and new planted seedlings are only ready for first harvesting after 3 years.
  - Over time, the yield curves can converge to reach the average optimal expected yield of 5,261 kg GL/acre, if farmers adopt GAP and infilling reaches 100%.

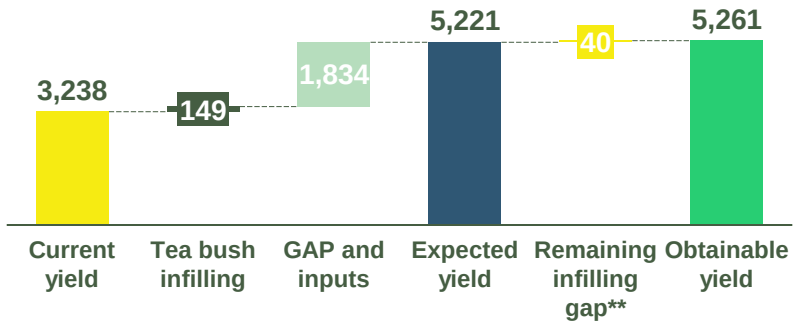
Yield enhancement factors

Over time, average, in kg green leaf/acre

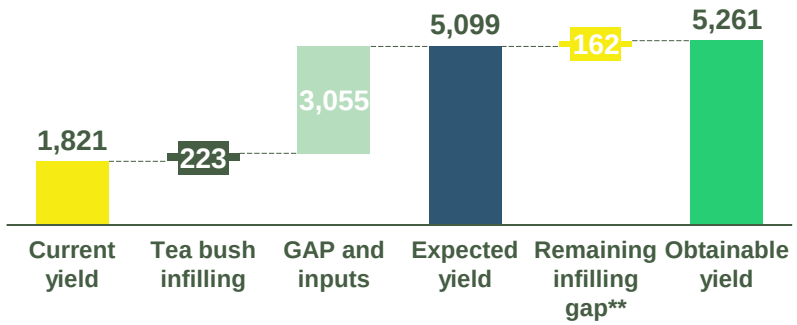
Baseline farmer becoming SDM active farmer



SDM active



Dormant farmer becoming SDM active farmer



* Averages for tea bush density and yield per acre are based on the PDC data collected across farmer segments.
** Remaining infilling gap refers to the additional tea bushes farmers will need to infill after 10years to continue closing the tea bush density gap to reach 4,000 tea bushes. This is because an infilling rate of 10% is modelled per year as farmers have limited finances to close the gap immediately.

3.4 Assumptions and Methodology

Key assumptions and background information

This section:

- *Shows all assumptions used for the SDM operator*
- *Shows all assumptions used for the different farmer segments*
- *Explains the methodology of the Primary Data collection*
- *Explains the methodology of the Digital Transformation Assessment*
- Contains a list with all abbreviations used in the report

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The below key assumptions were used for the SDM operator analyses

	General
Exchange rate	2,308.74 TZS/USD
Loyalty rate – Active farmer	75-95%
Purchase price of made tea – primary grade	USD 1.18/kg Made Tea
Purchase price of made tea – secondary grade	USD 0.69/kg Made Tea
Made tea to green leaf out-turn ratio	23%
Grade ratio	Primary 80%- Secondary 20%
Processing cost	USD 1.55/kg Made Tea
Working capital days	30

	FY 20/21	FY25/26
New farmers	-	412
Total number of farmers	2,743	3,633
Total acreage SDM farmers	2,743	3,633
Total sourced GL volume	3,739,578 kg GL	18,085,032 kg GL
Max factory processing capacity	11,000,000 kg GL	18,000,000 kg GL
Total processed Made Tea volume	860,103 kg Made Tea	4,195,557 kg Made Tea
Sales channel Made Tea	95% auction, 5% local	35% auction, 60% direct, 5% local
Share of capex financed externally	-	100%
Share of external working capital finance	-	100%
Cost of capital (Capex, inputs, working capital)	18%	18%

Sources: Ikanga interviews, financial accounts FY18/19, list of staff FY 18/19 and FY 20/21

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The below key assumptions were used for the farmers

	Baseline farmer*	Dormant farmer*	SDM active farmer
Farm size (acre)	3		
Tea farm size (acre)	1		
Total bushes (#/acres)	**y1:** 3,707, **y10:** 3,873	**y1:** 3,707, **y10:** 3,873	**y1:** 3,856, **y10:** 3,945
Yield per acre (Kg GL/acre/year)	**y1:** 2,732, **y10:** 5,099	**y1:** 1,821, **y10:** 5,099	**y1:** 3,238, **y10:** 5,221
Production (Kg GL/year)	**y1:** 2,732, **y10:** 5,099	**y1:** 1,821, **y10:** 5,099	**y1:** 3,238, **y10:** 5,221
Post-harvest loss (%)	**y1:** 5%, **y10:** 2.6%	**y1:** 5%, **y10:** 2.6%	**y1:** 5%, **y10:** 2.4%
Side selling (%)	**y1:** 100%, **y10:** 5%	**y1:** 50%, **y10:** 5%	**y1:** 25%, **y10:** 5%
Tea FGP Ikanga (TZS/kg GL)	314 TZS/kg GL		
Tea FGP competitor (TZS/kg GL)	350 TZS/kg GL		
Other crop net income (TZS/year)	980,397	980,397	564,641
Livestock net income (TZS/year)	452,195	452,195	212,124
Fertilizer requirement (kg/acre)	**y1:** 1 bags/acre, **y10:** 4 bags/acre	**y1:** 0 bags/acre, **y10:** 4 bags/acre	**y1:** 1 bags/acre, **y10:** 4 bags/acre
Herbicides requirement (l/acre)	**y1:** 0.75 l/acre, **y10:** 1 l/acre	**y1:** 0l/acre, **y10:** 1 l/acre	**y1:** 0.75 l/acre, **y10:** 1 l/acre
Fertilizer price (TZS/bag)	**y1:** 62,500 TZS/bag, **y10:** 52,280 TZS/bag		
Herbicides price (TZS/l)	**y1:** 12,000 TZS/l, **y10:** 7,500 TZS/l		
Seedlings price (TZS/seedling)	350 TZS/seedling		
Equipment (TZS)	28,000 TZS		
Mechanized harvester fee (TZS/kg GL)	81 TZS/kg GL		

** Baseline and Dormant farmers values for year 10 represent their change in variable by becoming an SDM active farmer over time, if they would not transition their variables would remain the same value as in year 1*

Sources: Ikanga interviews and PDC data

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Farmer data collection

- **Description:** IDH uses the primary data collection to get an understanding of the farmers involved in the SDM and support with the farmer modeling. It is also meant to capture data related to gender, climate resilience, food security and living income. It can also serve as baseline to measure the future impact of an SDM.
- **Sample size:** 214 Njombe farmers that work with Ikanga (SDM active farmers) and 59 Njombe farmers that do not work with Ikanga (baseline or dormant farmers)
- **Sample location:** Njombe region
- **Sample period: :** 10/05/2021 – 14/10/2021
- **Sampling methodology:** To collect data on the SDM active farmers Ikanga provided a list of farmers from their active farmers database, from which Akvo randomly selected a sample. Of these selected outgrower farms several people were interviewed. However, Akvo often run into issues with the farmer list supplied by the Ikanga and thus has to look for additional farmers nearby to complete the sample. To collect data on the baseline and dormant farmers Akvo visited several farmers in the field that were not working with Ikanga.
- **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.

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IDH developed a methodology and tool to support our clients in their digital journey, including a data base

The Digital Transformation Assessment (DTA) 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

3.4 Assumptions | Sources

Source	Link (if publicly available)
CLK NET	https://www.researchgate.net/publication/271074858_WOMEN-PARTICIPATION-IN-AGRICULTURE-IN-TANZANIA_FV
DEMOGRAPHIC AND HEALTH SURVEY - Tanzania	https://dhsprogram.com/pubs/pdf/fr321/fr321.pdf
FAO – Report on tea industry in Tanzania	http://www.fao.org/economic/est/est-commodities/tea/tea-meetings/tea22/en/
FAOSTAT	http://www.fao.org/faostat/en/#data/QC
GLOBAL AGRICULTURE AND FOOD SECURITY PROGRAM	http://repository.businessinsightz.org/handle/20.500.12018/7315?show=full
IFC	https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/gender+at+ifc/priorities/entrepreneurship/investing+in+women+along+agribusiness+value+chains
IISD	https://www.iisd.org/system/files/publications/ssi-global-market-report-tea.pdf
INDEXMUNDI	https://www.indexmundi.com/commodities/?commodity=tea
LAND FOR AGRICULTURE IN TANZANIA	https://www.researchgate.net/publication/281631569_Land_for_Agriculture_in_Tanzania_Challenges_and_Opportunities
RAFFL	https://www.raflearning.org/post/responsible-agriculture-finance-for-smallholder-farmers-tanzania-and-uganda
THE EAST AFRICAN	https://www.theeastafrican.co.ke/tea/business/tanzania-targets-five-regions-to-boost-tea-yields-and-sales--1404400#:~:text=Tea%20Board%20of%20Tanzania%20(TBT,%2C%20Mbeya%2C%20Tanga%20and%20Kagera.
THE TEADETECTIVE	http://theteadetective.com/TeasOfAfrica.html
UNICEF	https://www.unicef.org/tanzania/media/2141/file/Tanzania%20National%20Nutrition%20Survey%202018.pdf
VALUE CHAINS	https://www.researchgate.net/publication/263465931_Value_Chains_and_Chains_of_Values_Tracing_Tanzanian_Tea
WAGENINGEN WUR	https://research.wur.nl/en/publications/making-sustainable-smallholder-tea-farming-a-viable-business-base-2
WORLD BANK – Tanzania's tea sector	https://openknowledge.worldbank.org/handle/10986/9677
WORLD BANK – Global Findex	https://openknowledge.worldbank.org/handle/10986/29510
WORLD ECONOMIC FORUM	https://www.weforum.org/reports/gender-gap-2020-report-100-years-pay-equality

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List of abbreviations

Abbreviation	Meaning
AMCOS	Agricultural and marketing co-operatives societies
DMA	Digital Maturity Assessment
DTA	Digital Transformation Assessment
EBIT	Earnings Before Interest and Taxes
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortization
FTE	Full-time equivalent
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
GL	Green leaf
IT	Information Technology
MT	Metric Ton (1,000 kg)
NGO	Non-governmental organization
P&L	Profit and Loss statement
SDM	Service Delivery Model
SHF	Smallholder farmer
SWOT	Strengths, Weaknesses, Opportunities & Threats
TZS	Tanzanian Shilling (currency)
USD	United States Dollar (currency)

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