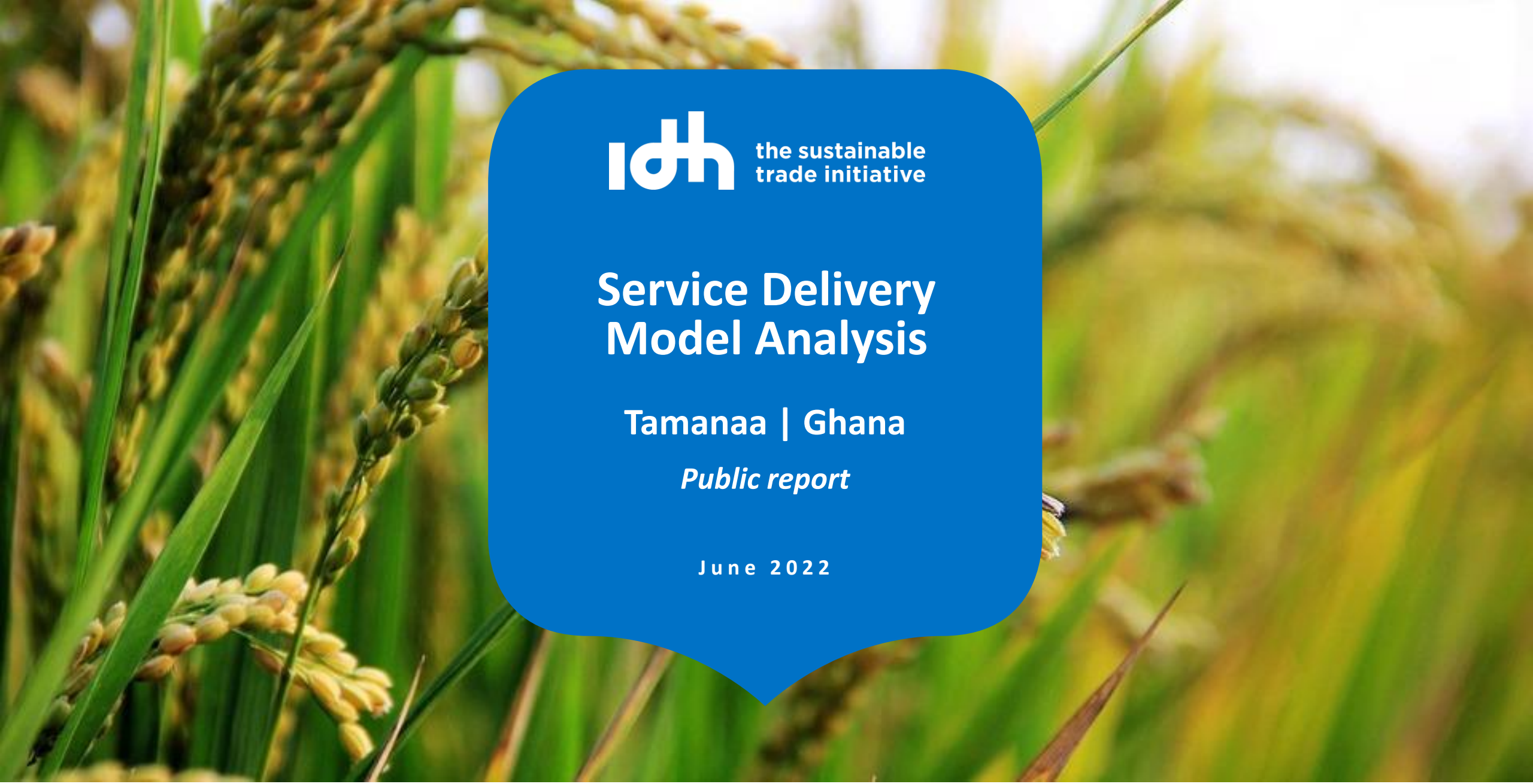

the sustainable trade initiative

Service Delivery Model Analysis

Tamanaa | Ghana

Public report

June 2022

Swiss Confederation
Federal Departement of Economic Affairs, Education and Research EAER
State Secretariat for Economic Affairs SECO

Ministry of Foreign Affairs

DANIDA

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Introduction

Introduction to Service Delivery Models and word of thanks

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.

Thanks

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

Introduction

Chapters in this report

1. Executive summary
2. Strategy and business model
3. Business case
4. Impact case
5. Annex

Executive Summary

Executive summary

About Tamanaa's strategy and Service Delivery Model

Strategy

Objectives | Tamanaa is a grains processor with a diversified sourcing channel mix. Their goal is to be among the top 10 rice mills in Ghana in terms of efficient use of installed capacity, while simultaneously making an impact at the community level. To achieve this, they focus on:

1. Utilize their full processing capacity of 110k MT and source at least 50% from outgrowers
2. Increase the number of outgrowers from 4,000 to 7,000 and consistently provide them with a cost-effective service package
3. Create impact in the communities through improved livelihoods by setting up women parboiling groups and VSLA's

Organization & partners | The vast majority of Tamanaa's employees (60%) plays a role in the processing of rice, whereas 20% of employees is dedicated to the outgrowers and the service delivery. They work together with input providers, a bank, development organizations and governments to deliver the range of services to their farmers

Sourcing channels | Their diversified sourcing channel mix consists of the open market, their own farm, outgrowers and commercial farmers. Each channel has its own advantages and limitations. Leveraging all channels Tamanaa seeks to rapidly scale up their sourcing volumes to 110,000 MT rice per year in order to fulfil the capacity of their processing facility, shifting the focus to outgrowers

Service delivery model

Farmer engagement | To meet their sourcing targets, average volumes would need to grow to over 8 MT per farmer by increasing yields as well as farm sizes. The aim is to intentionally onboard more female farmers to work towards a 50-50% split by 2025. Tamanaa could improve the engagement with their farmers by implementing a clear segmentation and graduation strategy and consistently collect and monitor farm-level data

Service package | Farmers receive a comprehensive service package, including GAP and financial literacy training, mechanization, and pre-financing of inputs, to ensure timely access of adequate high-quality inputs

Farmer clusters | Tamanaa sources rice from clusters of farmers that manage adjacent plots to achieve efficiency gains. These clusters receive services as a group and are responsible for repayment as a group. They source rice through a growing number of these clusters, and additionally they train and equip spraying teams

Women's empowerment | Tamanaa sets up and supports women groups and VSLAs and trains these women in parboiling. The groups parboil rice for Tamanaa and save the profits in the VSLA. Tamanaa's work on gender can be considered opportunistic.

Executive summary

Tamanaa's Business case and Impact case

Business case

Sourcing | Tamanaa's own farm and their outgrowers are the most cost-effective sourcing channels due to the high degree of control over these models and the relatively high-quality rice. They makes the largest margin from their own farm due to high yields and efficiency, but volumes are limited by availability of land and labor. Margins from outgrowers and commercial farmers are comparable, but outgrowers provide better quality and have the potential to further improve their yields. Open market sourcing is least preferred due to lower quality and availability, while costs are comparable

Profitability | Tamanaa's SDM is profitable and EBT is projected to grow with 40% between 2021 and 2025, mainly driven by growth in volumes. From 2023 onwards the majority of rice paddy is sourced from outgrowers, as Tamanaa will focus on that channel. Although the SDM is profitable, EBIT per farmer declines by 19% between 2022 and 2025. This is a result of the fact that the growth in farmer numbers outpaces the volumes sourced, since farmers have not yet reached their full yield potential

Financing needs | To reach the projected volumes from outgrowers, Tamanaa requires a significant amount of working capital for prefinancing of inputs and procurement of rice paddy. The SDM's short-term finance needs grow to X.X M USD by 2025 as the outgrower sourcing and input pre-financing grows. Another X.X k USD is required upfront to enable investment in storage and mechanization services

Impact case

Improved farmer performance | SDM farmers already outperform Baseline farmers significantly, and there is potential for further improvement by increasing yields, increasing share of high moisture rice, and decreasing post-harvest losses. In order to achieve this, SDM farmers must incur higher costs due to increased use of prefinanced inputs. However, this is worth the investments when farmers succeed in doubling their yield as expected, with the potential to improve even further

Financial support | These increasing yields in combination with decreasing post-harvest losses are the key drivers of the income uplift for SDM farmers. For this, inputs on credit are crucial for SDM farmers to enable them to make the required investment in their farms. Additional small investments from the farmers in equipment are still needed and Tamanaa should explore the possibility to support there as well if need be

Risks and potential returns | Although the performance for SDM farmers is much better on a *per acre* basis, they perform worse on a *per MT* basis. This puts pressure on farmers to reach the higher yields that they are expected to achieve. Depending on improvements in yield and expanding land sizes, SDM farmers can potentially close the living income gap in the short term

Executive summary

Main recommendations

Invest in structural trainings

- Farmer trainings currently take place on an ad hoc basis, depending on NGOs and development organizations and their willingness to invest in these trainings
- To make sure farmers are trained regularly and consistently, and to safeguard the quality and contents of the trainings, Tamanaa should invest in a more structural training approach
- Although this will increase the costs for Tamanaa, it will reduce the risk of farmers not (sufficiently) increasing their yields, which is pivotal for the success of this SDM
- Collaborations (including exit strategies) with NGOs should be explored to build capacity and relieve financial pressure on Tamanaa to secure long-term viability

Scale mechanization services

- Tamanaa should invest in mechanization services for their two key sourcing channels, being their own farm and their outgrowers. Scarcity of adequate machinery as well as rising fuel prices lead to high costs for these services
- Sufficient availability of mechanized ploughing and harvesting services will significantly improve cost-efficiency as well as quality for both channels. Therefore, Tamanaa should try to attract financing support for this investment
- Although investing in their own machinery will be costly, it will also decrease their dependency on external suppliers who are often unreliable. Alternatively, Tamanaa could explore long-term contract with external parties to ensure the supply of aforementioned services, but these potential partners face the same high prices and limited availability

Develop gender strategy

- Gender is definitely on Tamanaa's agenda. Their target is to include 50% women into their value chain by actively recruiting more female farmers and setting up women parboiling groups
- However, their gender strategy can be considered opportunistic. A clear gender strategy should be formulated and documented, and this should be actively communicated internally as well as externally
- This strategy should include policies to make the workplace inclusive for both men and women
- Additionally, Tamanaa should start with better understanding the needs of female farmers and how to support them, and subsequently tailor their service offering to these needs

Executive summary

Key Insights and Innovations

Parboiling VSLAs

- The women parboiling groups and corresponding VSLAs provide a cost-effective solution for Tamanaa for the parboiling of rice with a low moisture content
- There is also a clear business case for the women for undertaking this value adding activity with profits currently averaging 100 GHS per week. Additionally, there is sufficient demand for their services and the groups have the ability to expand their capacity to extend their service offering to other rice processors
- Additionally, the savings aspect of the VSLAs provides the women with access to (small-scale) loans and increases their control over financial resources and thereby their (financial) independence

Strong outgrower business case

- The outgrower sourcing channel is attractive for Tamanaa. Although costs are slightly higher, this is compensated by the high quality. Additionally, there are sufficient farmers in the region to increase supply
- The business case for farmers is clear. They are expected to double their income from 81 $/year to 169 $/year through the service package, with the potential to improve their yields and thereby their income even further to 435 $/year
- However, improved yields are a necessity for success, and relatively expensive prefinancing of 119 $/acre is required to get there. This poses a risk to Tamanaa as well as the farmers, since these improved yields and revenues, and therefore the ability to repay, are not assured

Strategy

Strategy | Objectives

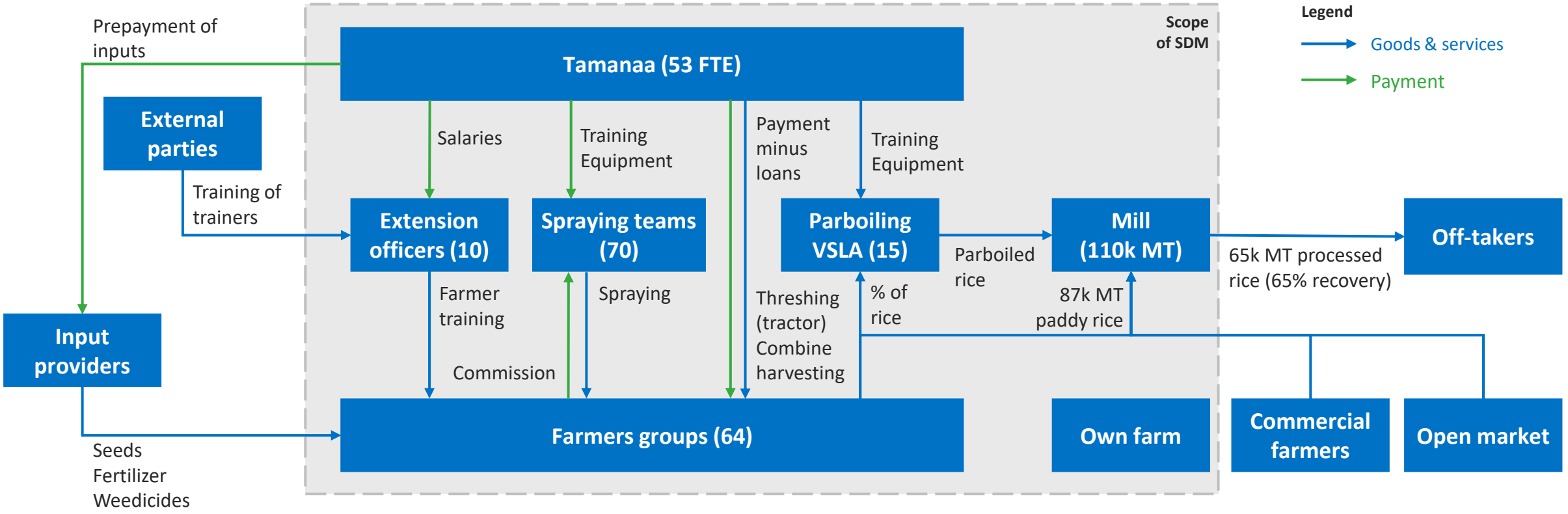
Tamanaa's goal is to be among the top 10 rice mills in Ghana in terms of efficient use of installed capacity while making an impact at the community level. To achieve this, they focus on three main aspects

	PRODUCTION	FARMER SUPPORT	WOMEN'S EMPOWERMENT
Objectives and targets	• Utilize the full processing capacity of 110,000 MT • Increase the share of rice sourced from smallholder farmers to >50%	• Increase number of outgrowers from 4,000 to 7,000 • Consistently provide a cost-effective service package to outgrowers	• Create impact in the communities through improved livelihoods by setting up women parboiling groups and VSLA's
Priorities	• Improved farmer production and productivity • Consistent supply of high-quality rice • Established nucleus farm to supplement outgrower production • Quality standards for produce are improved and sustained	Implement partnerships for: • Mechanization support • Supply of affordable, high-quality fertilizers, seeds and agrochemicals • Training in GAP and financial literacy	• Implement partnerships for training in parboiling and financial literacy • Provide access to parboiling equipment and materials • Ensure supply of cost-effectively parboiled rice
Limiting factors	• Outgrowers' current yields are far from their potential yield • Mill operators need to be trained to improve efficiency • Competition from Nigerian buyers	• Lack of (consistent) availability of extension officers • Rising prices of fertilizer and fuel • High costs for financing the increasing need for working capital	• High costs for financing equipment • Scattered groups increase transport costs

Strategy | Conceptual overview

Tamanaa is a grains processor with a diversified sourcing channel mix. They can process up to 110k MT paddy rice per year with their latest installed processing facility

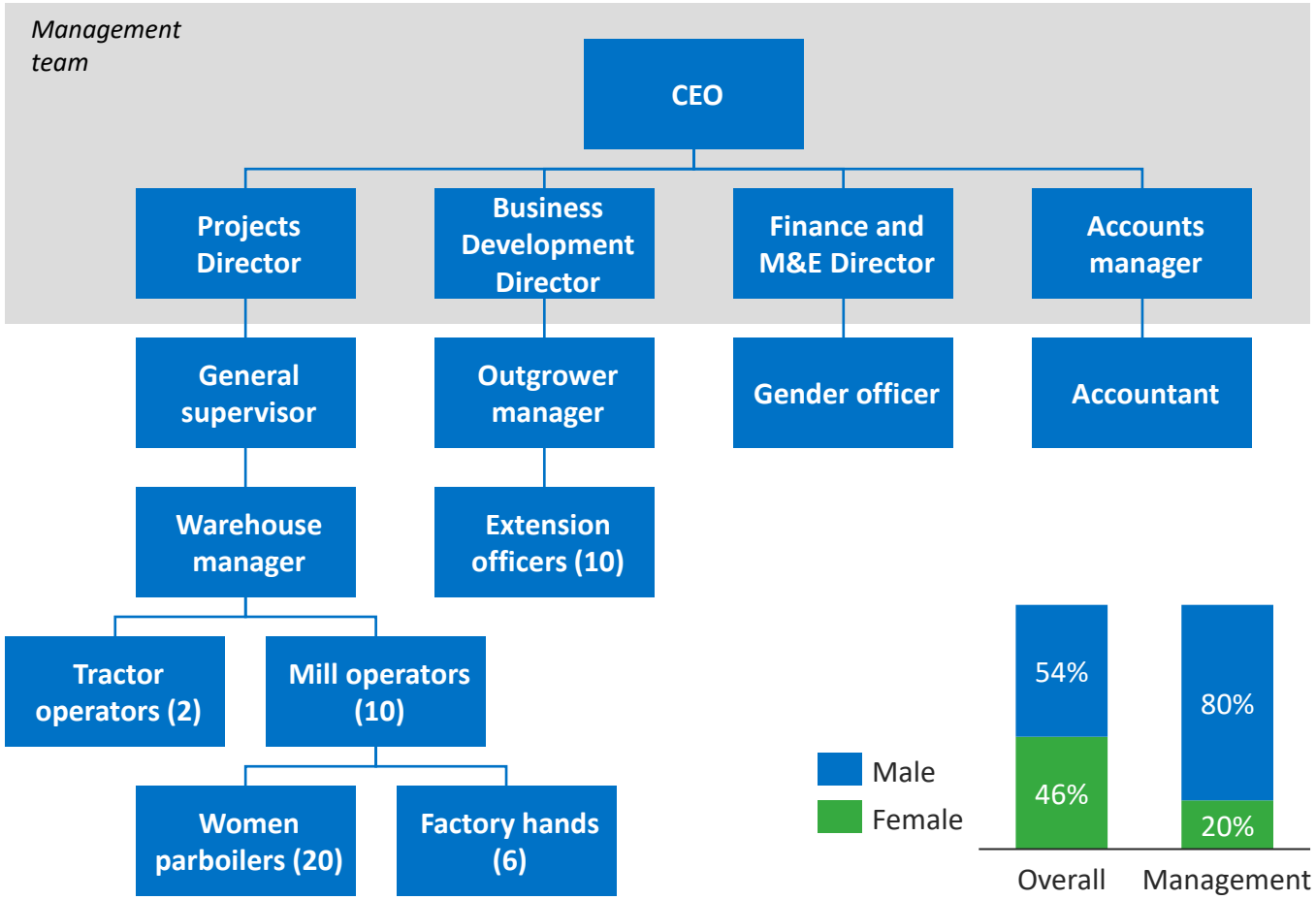
Conceptual overview of Tamanaa SDM, numbers given for 2021



Strategy | Organizational structure

The vast majority of Tamanaa's employees (60%) plays a role in the processing of rice, whereas 20% of employees is dedicated to the outgrowers and the service delivery

Tamanaa organogram 2021



- Tamanaa's organization currently consists of 58 employees, with a management team of 5 people
- Tamanaa aspires to expand the management team by hiring an HR director and an Extension director
- Of the 58 employees, 54% are male and 46% are female. At the management level the gender balance is more skewed, with 80% being male and only 20% female
- Tamanaa aims to reduce their extension officer to farmer ratio from 1:400 to 1:125 by growing the number of extension officers to 40 in the future

Strategy | Key stakeholders

Tamanaa works with input providers, a bank, development organizations and governments to deliver the range of services to their farmers

Actor	Legal Status	Function (within this SDM)	Revenue model (within this SDM)	Incentive to participate (within this SDM)
Azabu Nbebani	Private limited company (GHA)	Sells crop protection and fertilizers to Tamanaa	Margin on product sales	Increase sales volumes
Emtrade Farms	Private limited company (GHA)	Sells rice seeds to Tamanaa	Margin on seed sales	Increase sales volumes
KAM Trading & Farms Limited	Private limited company (GHA)	Sells combine harvesters to Tamanaa	Margin on harvesters and maintenance	Increase sales volumes
SAPIP	Government body (GHA)	Provides and subsidizes fertilizer	N/A	Development of the agriculture sector
Ecobank	Private limited company (GHA)	Provides working capital finance to Tamanaa Provides bank accounts to VSLA groups	Interests charged on loans Bank account fees	Increase sales volumes Expand customer base
Software provider	Private limited company (GHA)	Develops and maintain farmer management software	Recurring fees for software	Sales of product
2SCALE	NGO (NLD)	Supports in setting up and managing demoplots	Public funding	Meet donor targets
GIZ (and others)	Government body (GER)	Provide training of trainers (ToT)	Public funding	Meet donor targets

Strategy | Sourcing channels

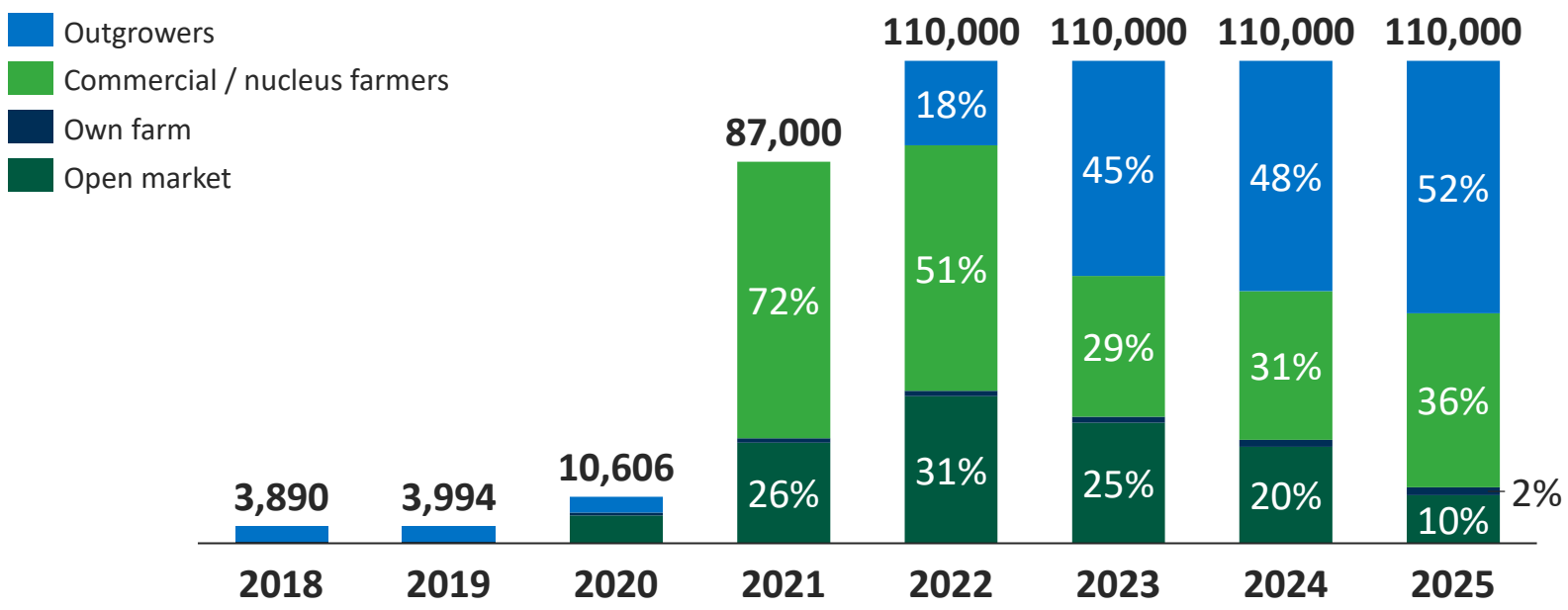
Tamanaa has a diversified sourcing channel mix, consisting of open market, their own farm, outgrowers and commercial farmers. Each channel has its own advantages and limitations

	Outgrowers	Commercial	Own farm	Open market
Characteristics	Farmer with on average 2 acres of service support Organized in clusters of 20 acres minimum, allowing efficiencies of scale	Farmers with up to 500 acres. Professional farmers with their own inputs. Few of these also buy from out growers (3 out of 50)	1,500 acres of land managed by own staff. As of 2021, 500 acres are productive	Smaller traders that sell any rice they find, to Tamanaa. Mostly used to fill the mill's capacity
Crops sourced	Rice, maize, soya	Rice	Rice	Rice, maize, soya, millet
Services received	• Training, seeds, inputs on credit • Combine harvesters	• Inputs on demand (occasionally) • Combine harvesters	• All	• No service relationship
Benefits	• Assurance of good quality • Consistent supply • Good relationship with local communities	• Large available supply	• Full control over production • Highest yields	• Flexible
Drawbacks	• Higher price	• Less control over / bargaining power	• Limited lands available	• Lowest quality • Unreliable

Strategy | Sourcing volumes

Leveraging all channels Tamanaa seeks to rapidly scale up their sourcing volumes to 110,000 MT rice per year in order to fulfill the capacity of their processing facility, shifting the focus to outgrowers

Rice sourcing volumes per channel over time, MT per year



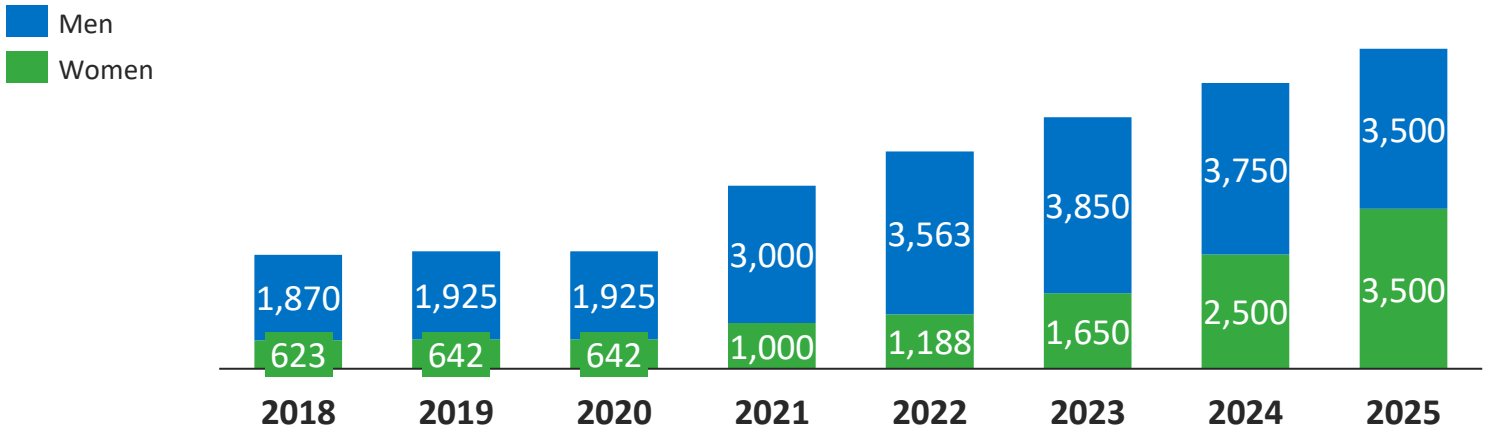
	2018	2019	2020	2021	2022	2023	2024	2025
Outgrowers	3,490	3,594	3,594	0	19,250	49,000	52,500	57,500
Commercial	0	0	0	63,000	55,950	32,100	33,900	39,700
Own farm	400	400	600	1,000	1,200	1,400	1,600	1,800
Open market	0	0	6,412	23,000	33,600	27,500	22,000	11,000

- Tamanaa aims to procure 110,000 MT rice per year in order to run their newly installed mill at full capacity
- For 2021 they relied heavily on commercial farmers and open market (72%) to complement their own farm and outgrowers
- They were not able to support outgrowers that year as they did not get additional loans from any bank. They were fully leveraged given the investment in their new mill
- Going forward they seek to reduce this dependency by continuing and expanding outgrower support, while further developing their block farm

Strategy | Outgrowers

To meet their sourcing targets, average volumes would need to grow to 8.22 MT per farmer by increasing yields and farm sizes. The aim is to intentionally onboard more women to work towards a 50-50% split by 2025

Outgrower farmer numbers and performance per year



	2018	2019	2020	2021	2022	2023	2024	2025
Farmers	2,493	2,567	2,567	4,000	4,750	5,500	6,250	7,000
Sourcing (MT)	3,490	3,594	3,594	0	19,250	49,000	52,500	57,500
Per farmer (MT)	1.4	1.4	1.4	0	4.05	8.91	8.4	8.21
Acres	2,493	2,567	2,567	5,459	11,487	15,602	20,344	25,714
Farm size (acre)	1	1	1	1.36	2.42	2.84	3.26	3.67
Yield (MT/acre)	1.40	1.40	1.40	1.40	1.61	1.82	2.03	2.24

- The main barrier to scale farmer numbers is working capital to pre-finance the input packages
- Of the 4,000 farmers that were registered with Tamanaa in 2021, none had received inputs
- Appropriate financing is key to increase the sourcing volume per farmer from 1.4 to 8.21 MT per year in 5 year
- Land availability is not an issue, farm expansion is driven by affordability and accessibility of finance
- Yields of around 2.24 MT per year are feasible given appropriate input packages

Strategy | Farmer relationships

Tamanaa has not invested too much in their farmers. They could improve this engagement by implementing a clear segmentation and graduation strategy and consistently collect and monitor farm-level data

Outreach

- Tamanaa has 10 extension workers who are responsible for farmer onboarding, training, harvesting and organization of the sourcing activities
- The extension workers receive a salary, a motor bike and some land to produce and utilize as demo plot

Selection

- Through chiefs and community leaders, Tamanaa scouts new groups
- Typically, they only support farmers who have between 2 and 5 acres to farm rice (if a farmer has more than 5 acres, they'll only get the package for 5 acres)

Contracting

- Contracting is done at the point inputs are provided on credit to the farmers. Farmers pay the inputs back in kind upon harvesting
- The remaining surplus can either be sold to Tamanaa or sold elsewhere. Most farmers decide to keep some stock
- Quality standards are not indicated in contracts, but quality-based payments are used

Segmentation

- Apart from having women only groups, there is no pre-existing approach to segmentation
- However, as part of the Mastercard funded project, female farmers will be prioritized for receiving input & mechanization services on credit (men will largely be required to pay up front)

Graduation

- Farmers regularly receive training on GAP and PHH, but there is currently no graduation strategy in place

Data collection

- Tamanaa utilizes an intake form to onboard new farmers and collect data
- The farmer data is kept in Excel

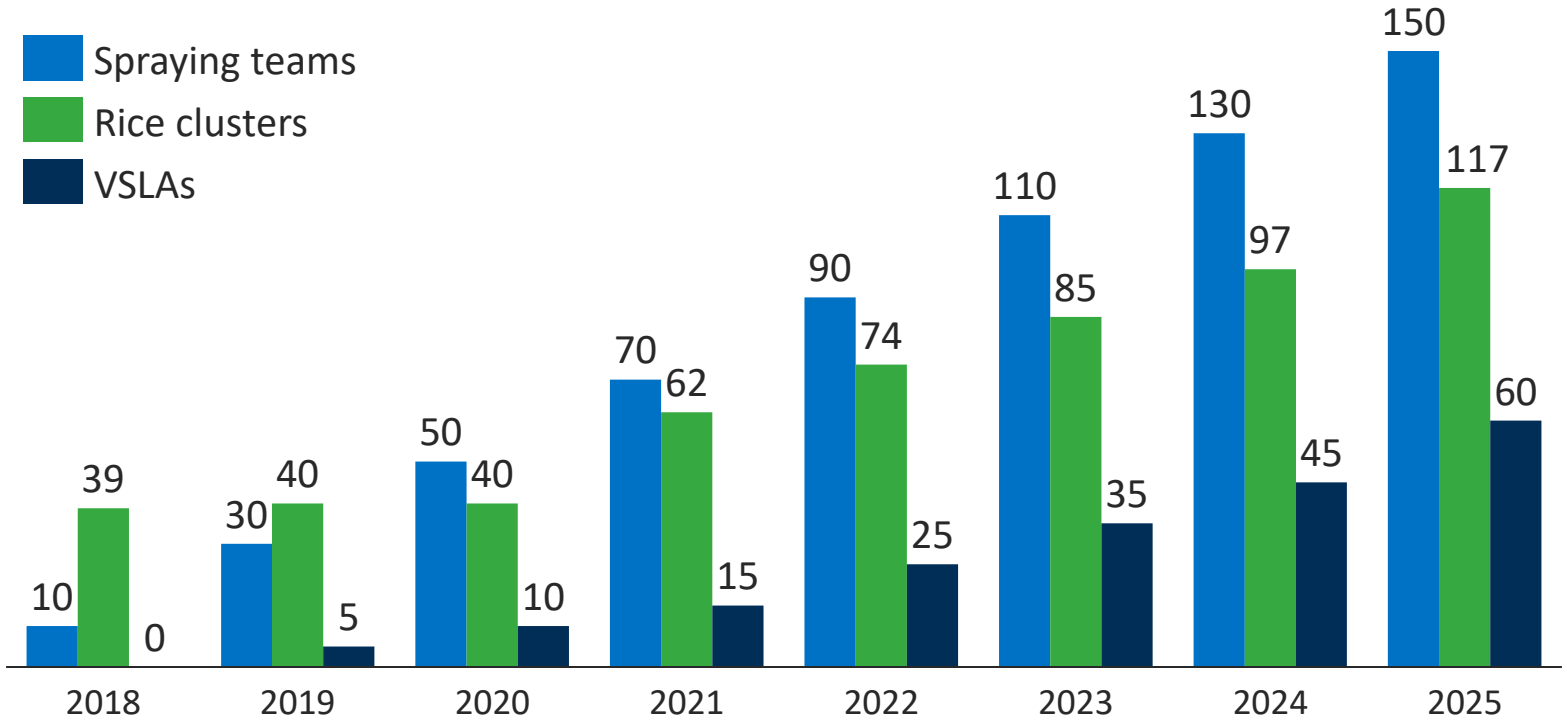
Strategy | Service package

Farmers receive a comprehensive service package, including pre-financing of inputs, to ensure timely access of adequate high-quality inputs

Service		Delivery mode	Impact	Revenue model	Status
Inputs	Fertilizer	• Tamanaa buys NPK and Urea from Azabu Nbebani and supplies them to farmers on credit	• Improved yield	At time of harvest, fertilizer and pre-financing costs are repaid in rice	**Fully operational**
	Seeds	• Tamanaa buys seeds from Emtrade Farms and supplies them to farmers on credit	• Improved yield • Improved quality • Drought resistance	At time of harvest, seeds and pre-financing costs are repaid in rice	**Fully operational**
Mechanization	Ploughing	• Tamanaa uses their own machinery to support farmers with ploughing • With their current capacity, they can only provide this service to 50% of their farmers	• Improved efficiency due to lower labor needs	At time of harvest, ploughing costs are repaid in rice	**Operational, but depending on capacity**
	Harvesting	• Tamanaa rents harvesters to support farmers with harvesting • Due to scarcity of harvesters, they can only provide this service to 30% of their farmers	• Lower post-harvest losses • Improved quality	Paid in rice at the moment the service is provided	**Operational, but depending on availability**
Financial	Insurance	• The input package includes an insurance that covers costs for floods, bushfires and drought (only for supported land)	• Improved financial resilience • Increased willingness to invest in farm	At time of harvest, insurance costs are repaid in rice	**Fully operational**
Training & information	GAP training	• External parties train extension officers, who train (lead) farmers • Some trainings are given on demoplots	• Improved yield • Improved quality	Costs covered by external parties	**Fully operational**
	Farming as a business & financial literacy	• External party train extension officers, who train (lead) farmers	• Improved understanding of financials and contracts	Costs covered by external parties	**Fully operational**

Strategy | Value chain actors

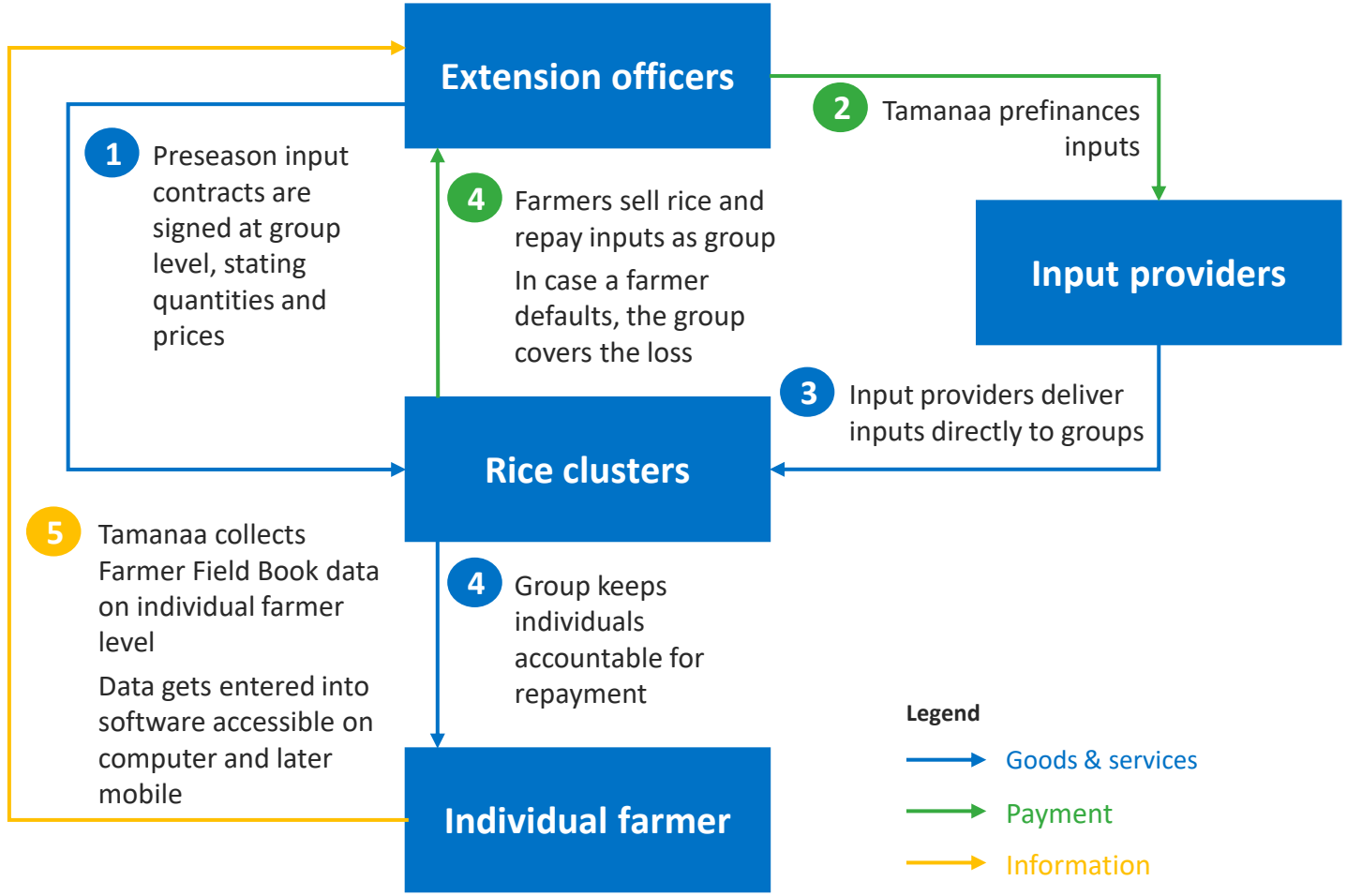
Tamanaa sources rice through a growing number of farmer rice clusters. They also train and equip spraying teams and support women in managing their parboiling centers and VSLAs



- Spraying teams, rice clusters and VSLAs are key entities through which Tamanaa delivers most of their services
- The number of spraying teams grows with the number of rice clusters. Both are expected to grow with approximately 20% annually on average in the coming years
- The focus will be on growing the number of VSLAs and women parboiling groups, with an expected average annual growth rate of around 40% in the coming years

Strategy | Rice clusters

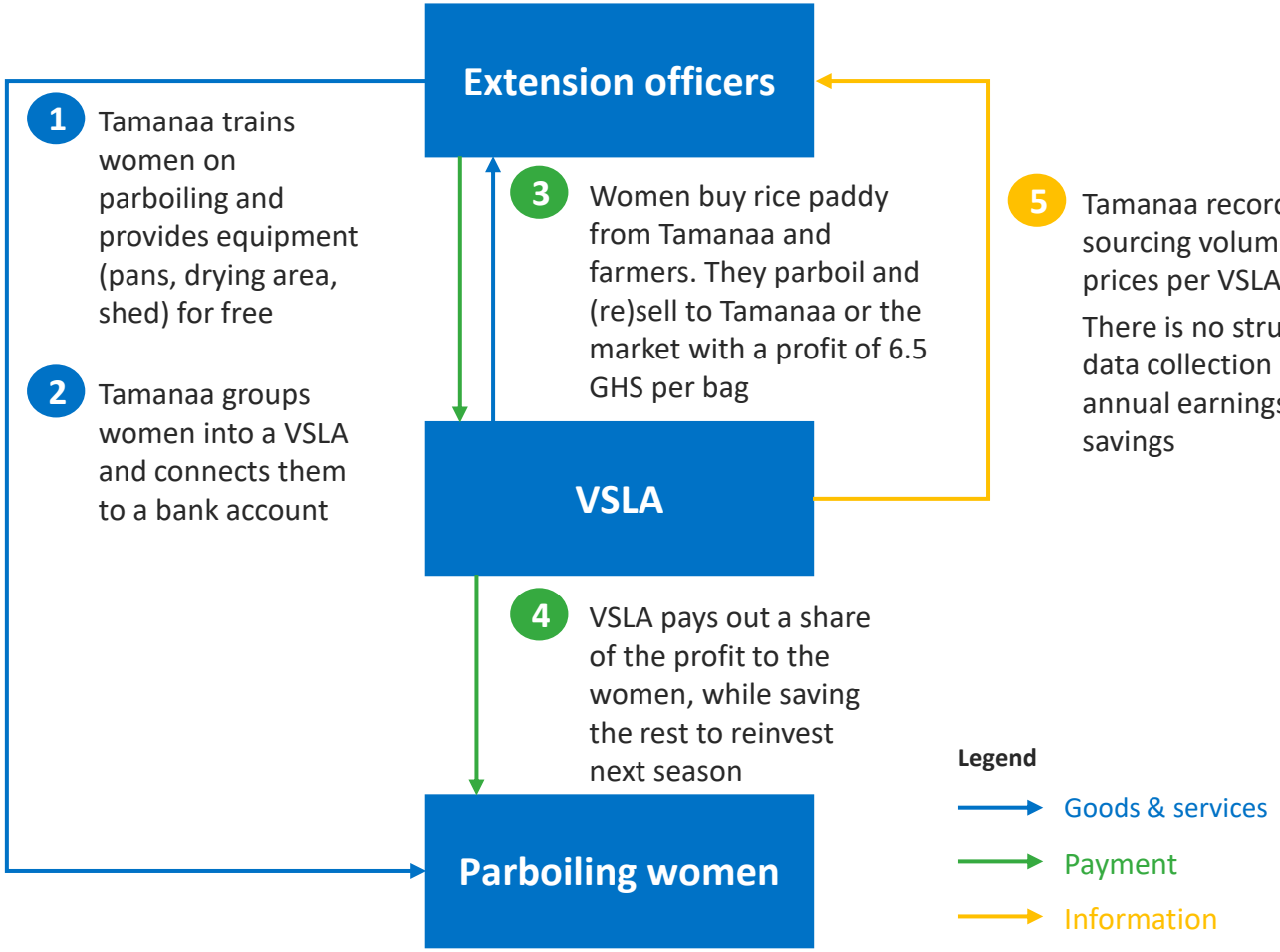
Tamanaa sources rice from clusters of farmers that manage adjacent plots to achieve efficiency gains. These clusters receive services as a group, and are responsible for repayment as a group



- As of 2021 Tamanaa works with 64 Rice clusters
- Groups consist of 15 farmers on average. Tamanaa sets the maximum at 25 to keep groups manageable
- Each group has a board of 5 members, including chairman, secretary and treasurer
- Farmers manage adjacent plots, loosely forming blocks of around 40 acres. This is efficient for the delivery of the inputs as well as for sourcing the rice
- Farmers receive inputs on credit as a group, depending on the availability of inputs and their preferences
- The entire group is liable for repayment of these inputs in kind. If one farmer defaults, they group covers for him. This social control leads to high recovery rates

Strategy | Women parboiling groups and VSLAs

Tamanaa sets up women groups and VSLAs and trains these women in parboiling. The groups parboil rice for Tamanaa and others, and save a share of the profits in the VSLA



- As of 2021, Tamanaa works with 15 VSLAs, that all consists of a maximum of 25 women who are trained in parboiling
- These women buy rice paddy with low moisture content from Tamanaa and parboil it, thereby increasing the moisture level and making it suitable for milling. This parboiled rice is then sold back to Tamanaa with a profit.
- The groups occasionally buy rice from farmers directly and sell it back to the market
- The capacity is 15 bags per person per week with an average profit per bag of 6.5 GHS, leading to profits of around 100 GHS per week. The capacity could be increased to around 20-25 bags per week, thereby increasing profits
- These profits are partly paid out to the women, while the remainder is reinvested into the VSLA account

Strategy | Gender quick scan

Tamanaa seems to work on gender in an opportunistic way. Improvements can be made by documenting a clear strategy and starting to better understand the needs of female rice farmers and how to support them

Category	Answer	Explanation
Gender Strategy Is gender equality a strategic goal for Tamanaa which is communicated in documents?	**No**	Tamanaa aims to include 50% women (rice farmers, parboilers) into their value chain. Tamanaa employs a dedicated gender champion that oversees inclusion within the company, VSLAs, and outgrowers. There is no documented strategy
Data Collection Does Tamanaa collect data on staff or customers / farmers disaggregated by gender?	**Yes**	Tamanaa records the gender of each farmer it's working with.
Inclusive workplace Does Tamanaa have policies or practices to make the workplace inclusive for both women and men?	**No**	No proof of clearly spelled out policies or practices to build an inclusive workplace
Inclusive consultation Does Tamanaa speak to or consult both male and female customers (farmers) to learn about their different needs and preferences when designing a product	**Yes**	Groups are often segregated, allowing Tamanaa to host separate focus group sessions with men and women.
Inclusive tailoring If services are tailored based on customers' needs and preferences, does Tamanaa tailor these based on how needs may be different for men and women?	**Partly**	Tamanaa does not offer a distinct service package for female rice farmers. Tamanaa does organize women into VSLAs and provides equipment to set up parboiling centres with which women can earn their own money.
Independence and control over resources Does Tamanaa provide services that allow women to have more independence and control over resources or move into roles in which they can gain more value?	**Yes**	In case of the parboiling and saving activities, women have full control over those activities and resources. Women can decide with their groups how to spend the savings for next year. If other business opportunities arise, they might pick up on those

Strategy | Operational review (1/2)

Based on a diagnostic study carried out by AFG, certain performance gaps concerning production have been identified

Production metric	Score	Rationale
Farmer selection		Community entry and sensitization, farmers willingly register, policy of gender inclusion (40%) currently 25-30% but has implementation challenges in terms of reach
Outgrower Management & Contracts		Some evidence of written contract on agreed terms, support services seed, input, mechanization, extension and recovery
Provision of Inputs		Supports for farmers available (seed, fertilizer and sometimes chemicals), however it doesn't cover all farmers
Provision of Machinery / Mechanization		Tamanaa links equipment service providers to contract to farmers, services are not available to all farmers and sometimes delay
Field management/Extension services		Has 10 extension staff working with 4000 farmers (160 FG), provide training on GAP, M&E and recovery. Poor evidence of records
Transport and Logistics		Uses third party transport services, not with registered and proven logistic companies
Embedded services (credit, ICT)		Little or no credit support and no evidence of the use of ICT in outreach activities with farmers
Knowledge management		Minimal evidence of knowledge management in the form of training manuals, and recipe. No evidence of information storage, retrieval and sharing

Strong **Average** **Weak**

Strategy | Operational review (2/2)

Based on a diagnostic study carried out by AFG, certain performance gaps concerning processing have been identified

Processing metric	Score	Rationale
Quality Management		The mill has all the necessary components for producing quality and quality management system inhouse in terms of procedure and respects quality standards
Processing Capacity/Efficiency		Huge capacity available (250 MT/day) but not used efficiently due to inadequate supply of raw material. Currently operating at 40MT/day
Packaging		Packaging is in 5 and 25kg and 50kg hygienic sacks according to offtaker specifications
Warehousing & Storage		Uses a third-party facility that is limited in capacity with limited drying area. This capacity has potential of limiting the company's ability to store raw material. Storage of milled rice in milling room does not follow best practice
Transport & Logistics		The company relies on local 3rd party haulage companies which may not respect quality procedures in transporting food items

Strong | Average | Weak

Business case

Business case | Sourcing channel characteristics

Tamanaa's own farm and the outgrowers are the most cost-effective sourcing channels due to the degree of control over the models and relatively high-quality rice

	Outgrowers	Commercial	Own farm	Open market
Share high moisture (%)	25%	20%	10%	20%
Processing recovery (%)	67%	60%	67%	60%
Share long grains (%)	65%	60%	60%	60%
Paddy price, high moisture (USD/MT)*	223	197	0	197
Paddy price, low moisture (USD/MT)*	184	158	0	158
Production cost (USD/MT)*	0	0	60	0
Farm services (USD/MT)*	8	0	0	0
Transport & storage (USD/MT)*	12	12	12	12
Processing cost (USD/MT)*	40	40	40	40
Sales price, long (USD/MT)*	683			
Sales price, short (USD/MT)*	434			

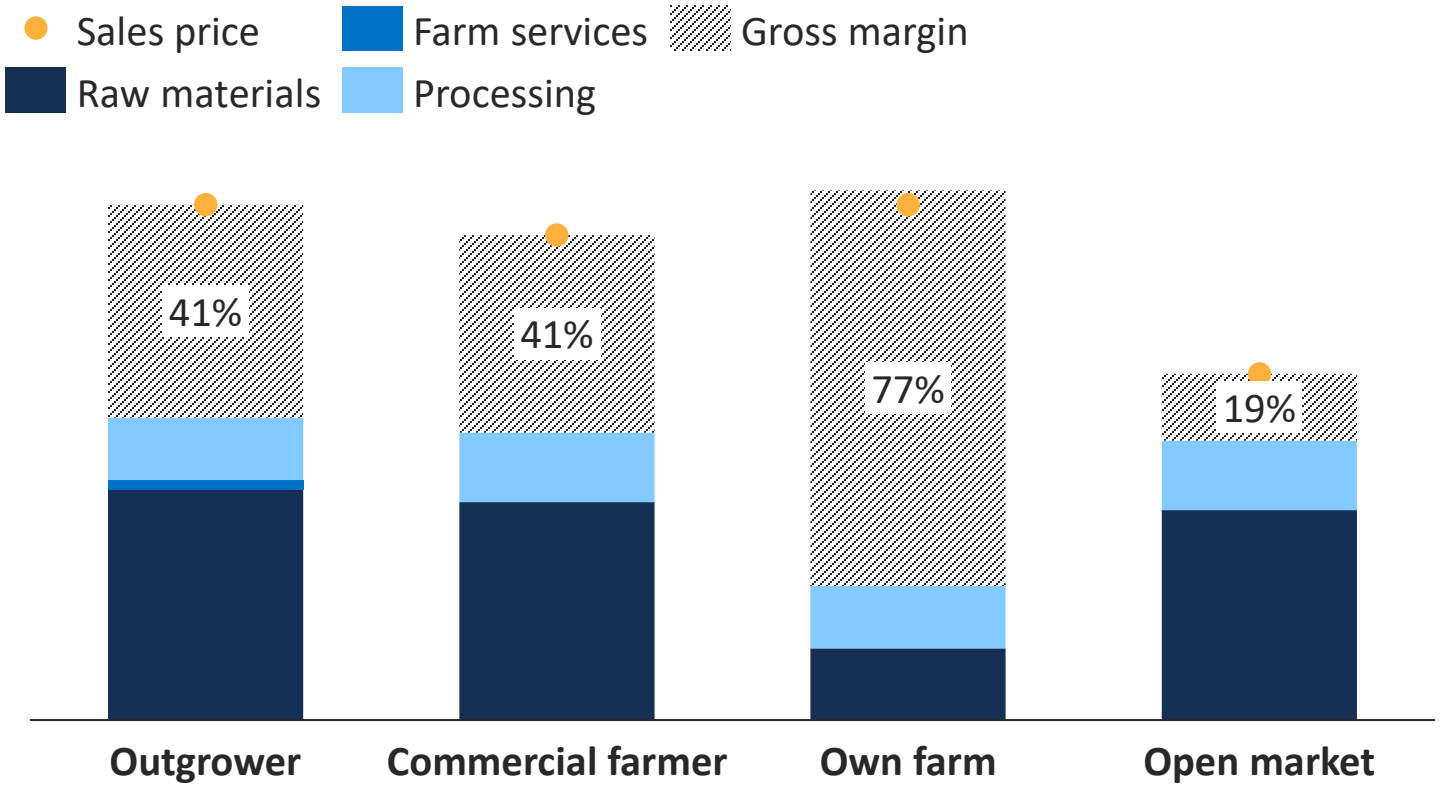
- Quality of rice varies greatly per sourcing channel. Outgrowers provide the highest quality with high moisture content and a large share of long grains
- Cost to source is also highest for this channel due to premiums, prefinancing of inputs, and farm services
- The open market quality is poor, with very low moisture content and high share of broken rice. As expected, prices fetched for the open market rice are much lower
- Their own farm's moisture content could be higher when harvested timely. Now combine harvesters are used early in the season, to free up capacity to support outgrowers

** Prices and costs are converted from GHS to USD using an exchange rate of 7.6 GHS/USD*

Business case | Sourcing channel profitability

Tamanaa makes the largest margin from their own farm, but volumes are limited. Margins from outgrowers and commercial farms are comparable. Open market sourcing is not preferred due to lower quality

Sourcing channel gross margin in USD per MT and % of rice sales price*



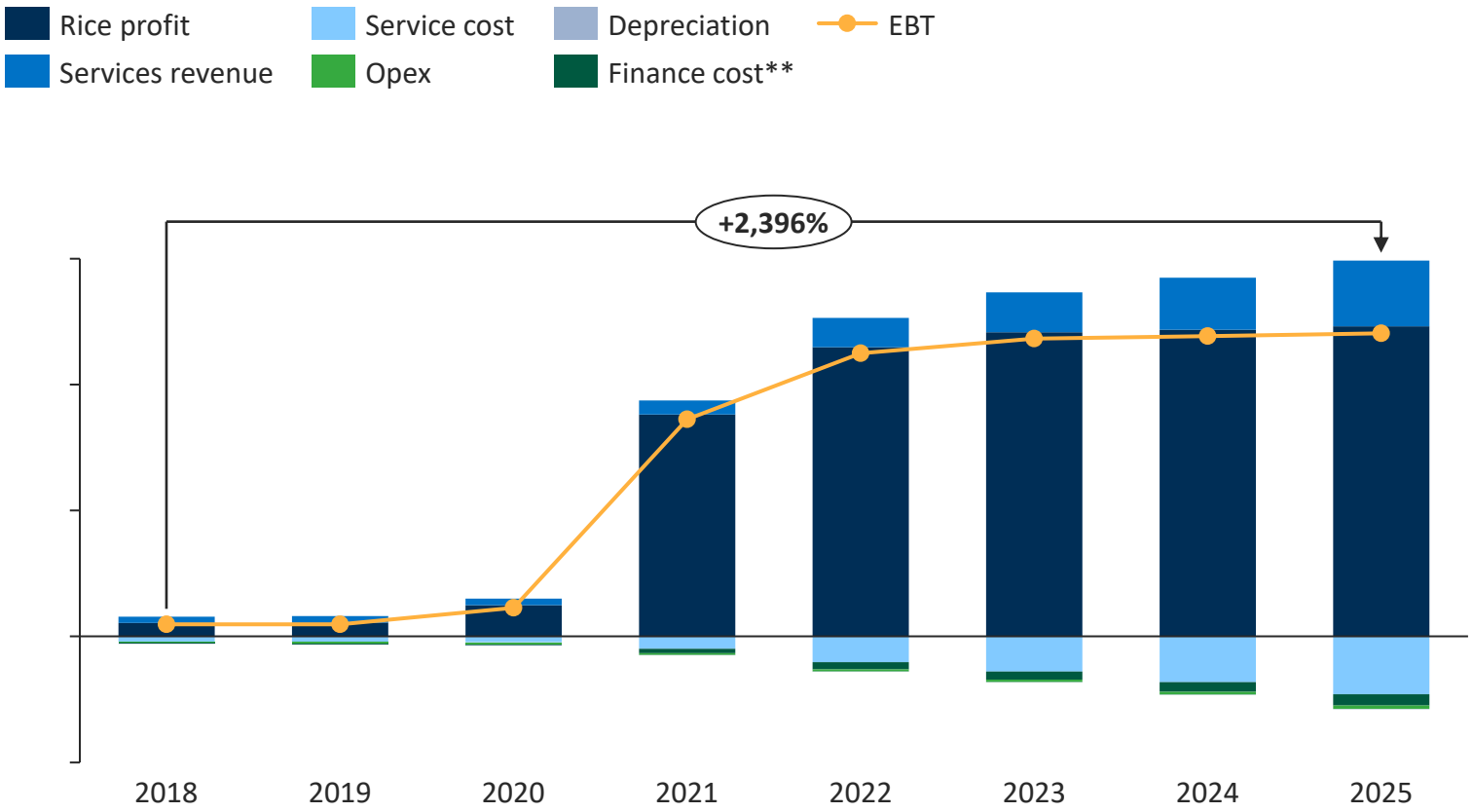
- Margins are highest for Tamanaa's own farm due to high yields and efficiency, but availability of land and labor limit the volumes from this channel
- While quality from outgrowers is higher than from commercial farmers, costs are also higher due to interests on input credit, farmer training costs and a quality price premium
- On the other hand, higher processing recovery for outgrower paddy (67% vs ~60%) makes processing more efficient compared to other channels
- Open market is the least profitable due to poor and inconsistent quality and availability, and relatively comparable costs

** Prices and costs are converted from GHS to USD using an exchange rate of 7.6 GHS/USD*

Business case | SDM P&L

The SDM is profitable and EBT will grow with 40% between 2021 and 2025, mainly driven by volume growth. To achieve this, Tamanaa requires a significant amount of working capital for prefinancing and sourcing

Profit and loss in '000 USD (2021 – 2025)*



- Tamanaa projects full utilization of their installed capacity of 110K MT by the end of 2022
- In 2022, the majority of the paddy processed will still be sourced from commercial farmers (51%). However, the share of paddy sourced from commercial farms and open market will decline, and from 2023 onwards the majority is sourced from SHF, as Tamanaa will focus on that channel
- As sourcing from SHFs increases, EBIT/MT sold flattens. This can be attributed to the c.11% increase in per MT cost from this channel. EBIT/MT can be increased further by reducing the per MT cost of sourcing

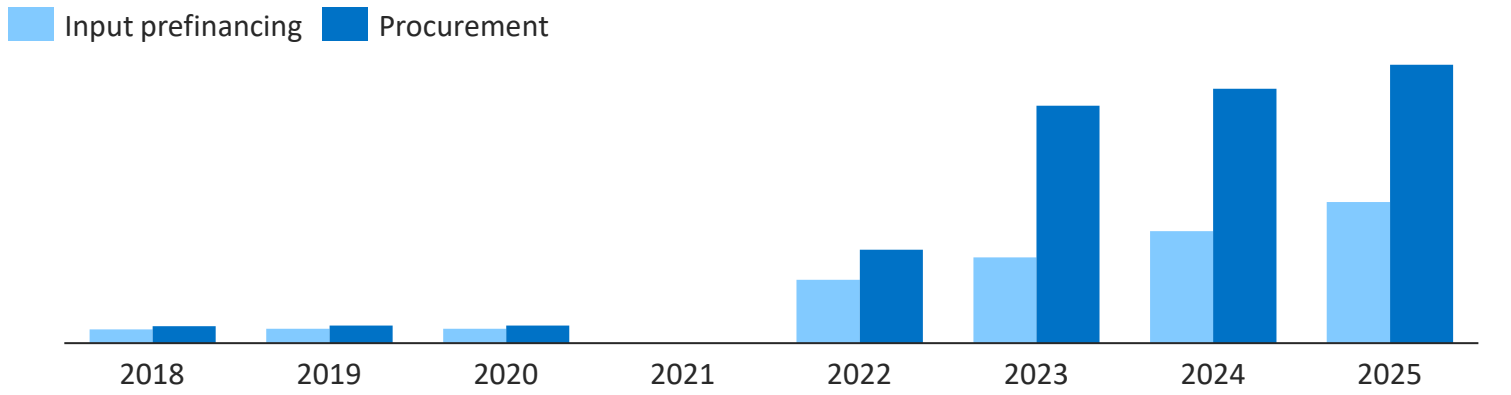
** An overview of KPI's can be found in the annex*

*** Finance cost includes interest charged on working capital to finance purchase of rice paddy and farmer inputs*

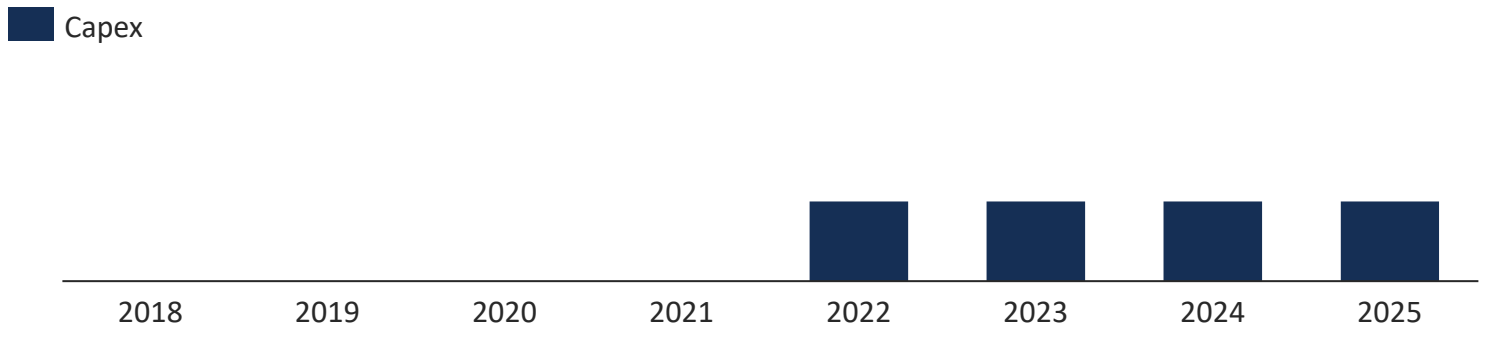
Business case | Financing needs

Tamanaa's short-term finance needs grow to X.X M USD by 2025 as it scales its outgrower sourcing and input pre-financing. They require X .X k USD asset finance to enable storage and mechanization services

Average annual short-term loans outstanding (< year)*



Average annual long-term loans outstanding*



- Short-term working capital (service package and paddy rice) finance for the outgrower rice only, rapidly increases from X to Y M USD in 2022, doubling by 2023 and tripling by 2025
- Providing Tamanaa with more affordable finance (e.g. if the 30% interest p.a. they currently pay could be decreased to 12%), could save X.X M USD between 2022-2025. This is equivalent to an additional 16,000 acres pre-financed with inputs, or an additional 8,000 MT of rice sourced
- In addition, Tamanaa seeks a X.X k USD long-term loan to invest in a 1,000 MT warehouse and additional vehicles and machinery**

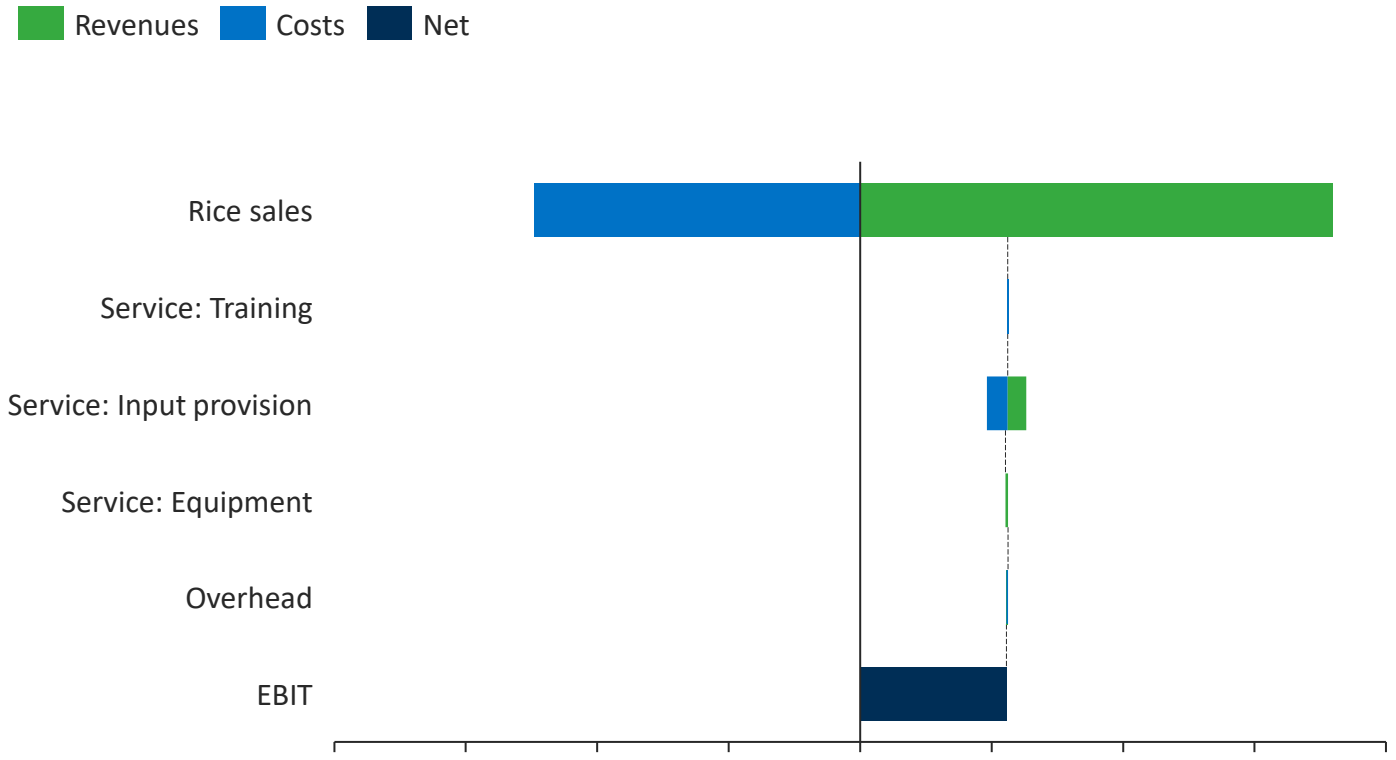
** Assumptions can be found in the annex*

*** Tamanaa is looking to buy 4 tractors, fence walls, KIA pick-up trucks, 4x4 pick-up trucks, 2 combine harvesters and a 1,000 KVA standby generator*

Business case | Service profitability

Although the SDM is profitable, EBIT per farmer declines by 19% between 2022 and 2025 as growth in farmer numbers outpaces volumes sourced, since farmers have not yet reached their full yield potential

Profit and loss in '000 USD, annual average 2021 – 2025*



- Provision of inputs to farmers is not profitable as Tamanaa absorbs the interest charge (30% p.a.) incurred to avail these inputs. This is done to ensure farmers have access to high-quality inputs to improve rice yield and quality
- EBIT per farmer declines from 2022 onwards, mainly due to Tamanaa increasing volumes sourced from outgrowers which is relatively expensive in comparison to other channels
- This therefore reduces the net income earned by Tamanaa in the short run, but is expected to increase in the future when farmers' yields increase

** An overview of KPI's can be found in the annex*

Impact case

Impact case | Farmer segments

SDM farmers already outperform Baseline farmers significantly, and there is potential for further improvement by increasing yields, increasing share of high moisture rice, and decreasing post-harvest losses

Distinctive characteristics*	Baseline**	SDM rice farmer**
Farm size	2 acres	2 acres
Current yield	700 kg/acre	1,400 kg/acre
Post harvest losses	30%	15%
Own consumption	120 kg	120 kg
Farmgate price | high moisture (>16%)	0.20 USD/kg	0.23 USD/kg
Farmgate price | low moisture (<16%)	0.16 USD/kg	0.18 USD/kg
Share of high moisture rice	15%	25%
Cost of inputs	20 USD/acre	119 USD/acre
Inputs used		
		Ploughing
	Seeds	
		NPK
		Urea
		Insurance

** Assumptions are based on the 2021 season. Prices and costs are converted from GHS to USD using an exchange rate of 7.6 GHS/USD*

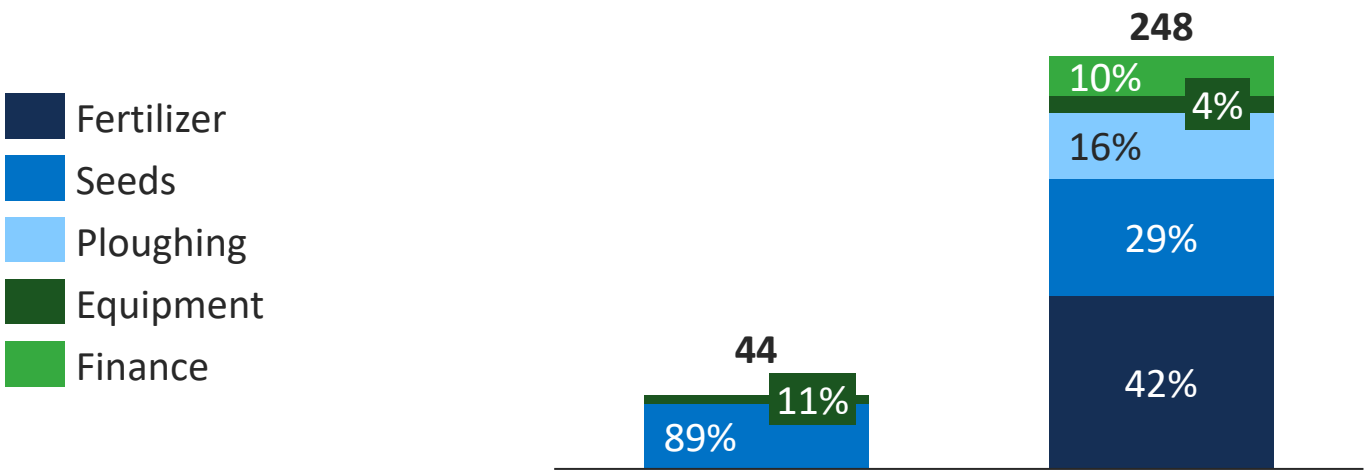
*** A Baseline farmer is a farmer not receiving services from Tamanaa. An SDM farmer is a farmer that does receive services from Tamanaa*

- SDM farmers are expected to be able to increase their yield to 2,500 kg per acre by applying GAP (e.g. different sowing methods)
- Due to limited availability, not all of Tamanaa's farmers receive ploughing services
- Mechanized harvesting could increase the share of high moisture rice up to 80% while also decreasing post-harvest losses, but harvesters are expensive and scarce
- While Tamanaa pays upon delivery, baseline farmers sometimes only get paid 6 months after delivery
- To decrease the usage of chemicals, farmers do no longer receive weedicides from Tamanaa

Impact case | Service package cost

SDM farmers incur higher costs due to increased use of inputs. However, this is worth the investments when farmers succeed to double their yield as expected, with the potential to improve even further

Input and service costs for rice in USD/farm, 2021*



	Baseline	SDM
Farm-gate price (GHS/MT)**	164	193***
Marketable surplus (Kg/acre)	490	1,190
Farm size (Acres)	2	2
Finance & insurance charge	0%	11%
Profit (USD/farm)	81	169

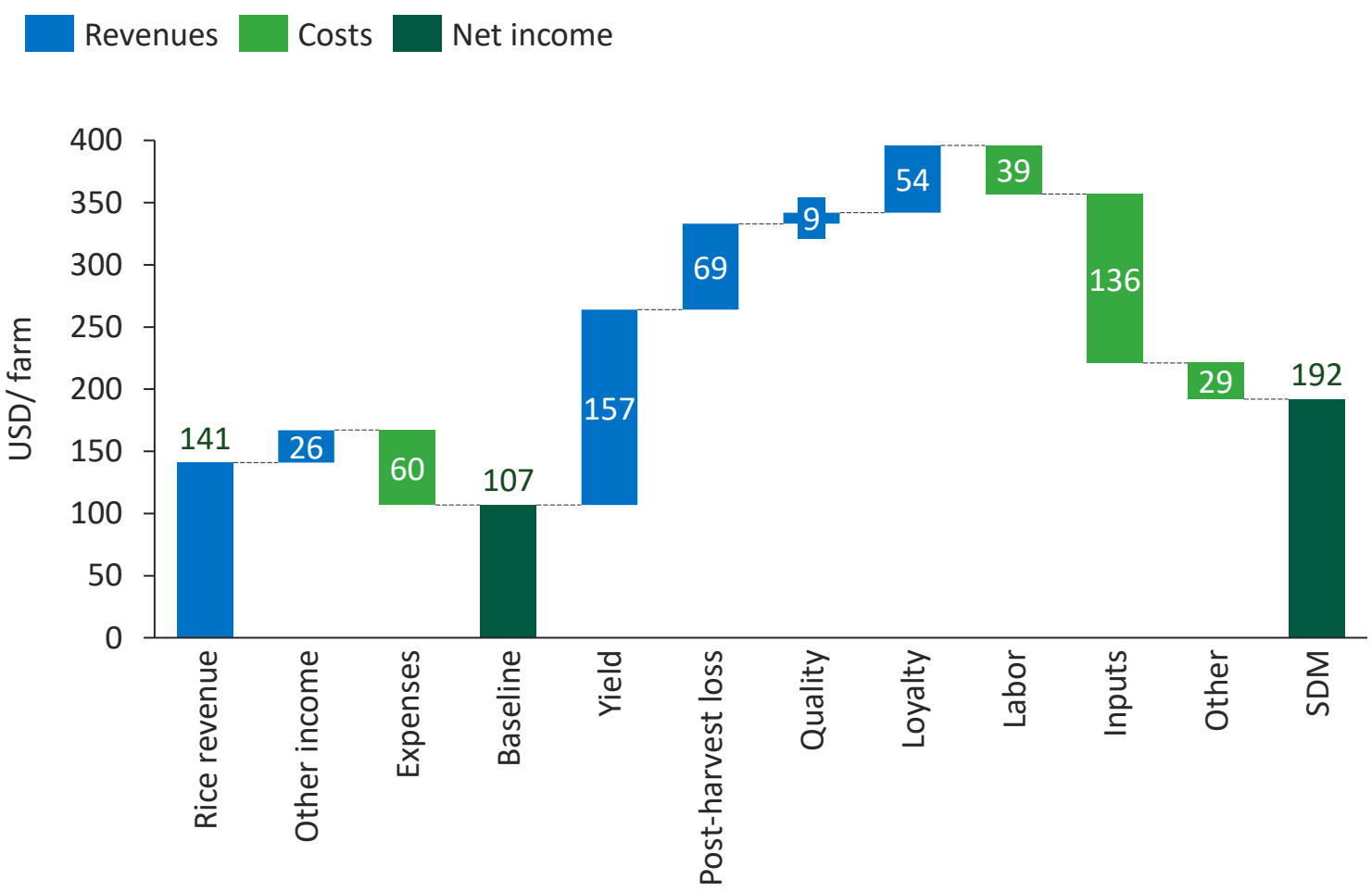
** Prices and costs are converted from GHS to USD using an exchange rate of 7.6 GHS/USD*
*** The farmgate price is a weighted average of farmgate prices for low moisture rice and high moisture rice*
**** Farmgate price for SDM farmers includes 15% premium paid by Tamanaa*

- SDM farmers are assumed to double their yield when joining the SDM. This increase is a key driver for the 109% increase in profit
- Farm labor costs are minimal as most is done with family labor, only hiring labor for mechanized ploughing
- SDM farmers' costs are 5.6 times higher in comparison to baseline farmers as they use the right quantity of higher quality inputs and hired mechanization for ploughing
- Tamanaa supplies their farmers with fertilizer and seeds as well as ploughing services. Based on increasing farm returns, farmers can cover the costs charged for these prefinanced inputs

Impact case | Cost and revenue drivers

Increasing yields and decreasing post-harvest losses are the key drivers of the income uplift for SDM farmers. If these improvements are realized, it justifies the relatively high upfront investments that are required

Rice income and revenue drivers in USD per farm in year 1

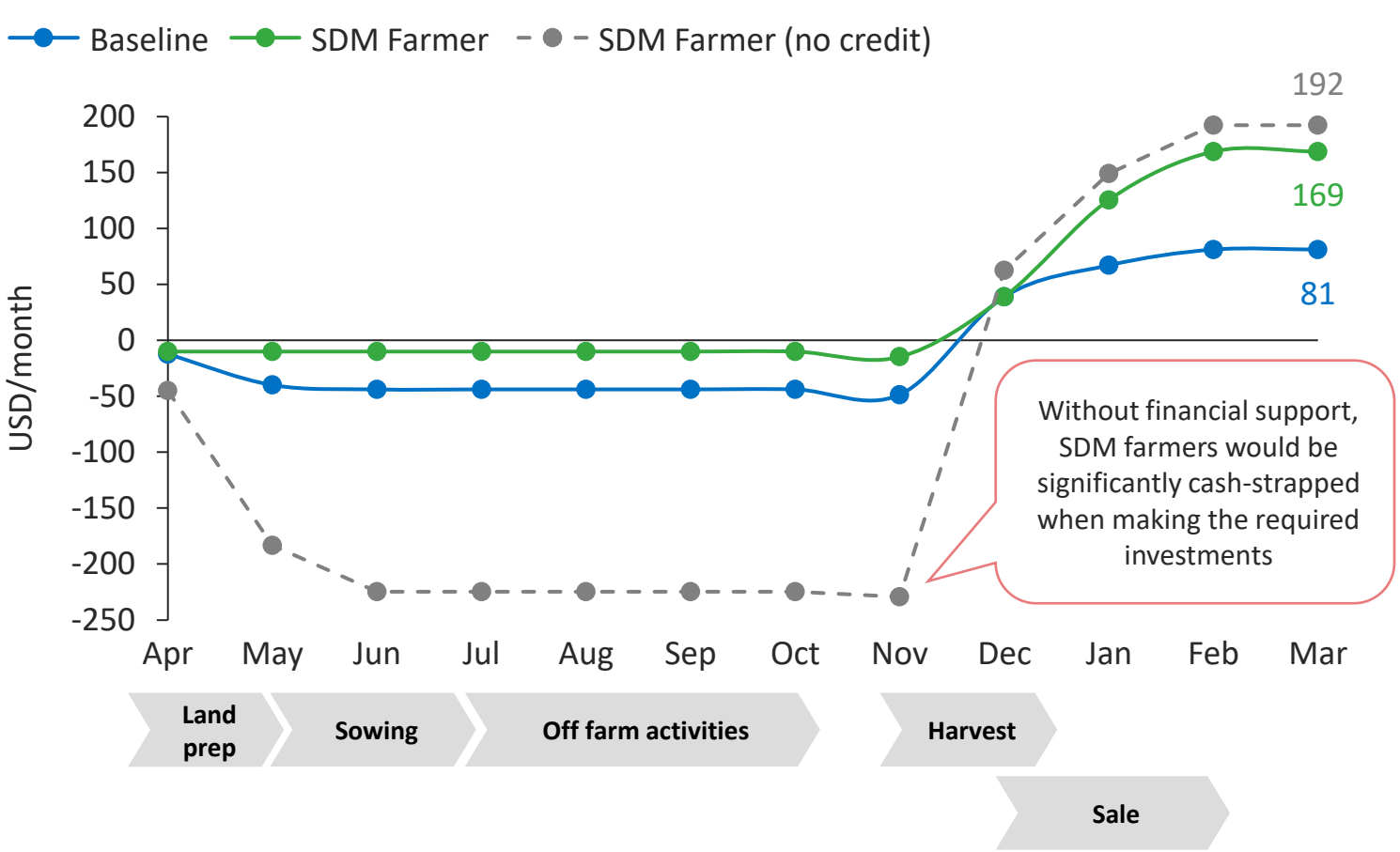


- Timely access to high quality inputs as well as credit to finance these inputs, is imperative for farmers to double their yield in year 1, and grow it with another 60% in the 4 years after
- Due to adoption of GAP, SDM farmers can immediately decrease their post-harvest losses
- Due to timely harvesting, SDM farmers can achieve 10% more high moisture paddy which fetches $0.04/Kg more than the low moisture paddy
- Tamanaa pays a 15% premium to its farmers. As SDM farmers sell more of their paddy to Tamanaa (95%), they earn an additional $54

Impact case | Cash flow

Inputs on credit are crucial for SDM farmers to invest in their farms and improve yields. Small investments in equipment are still needed and Tamanaa should explore the possibility to support there as well if need be

Cumulative net cash flow* for rice farmers in USD per farm per month – Year 1*



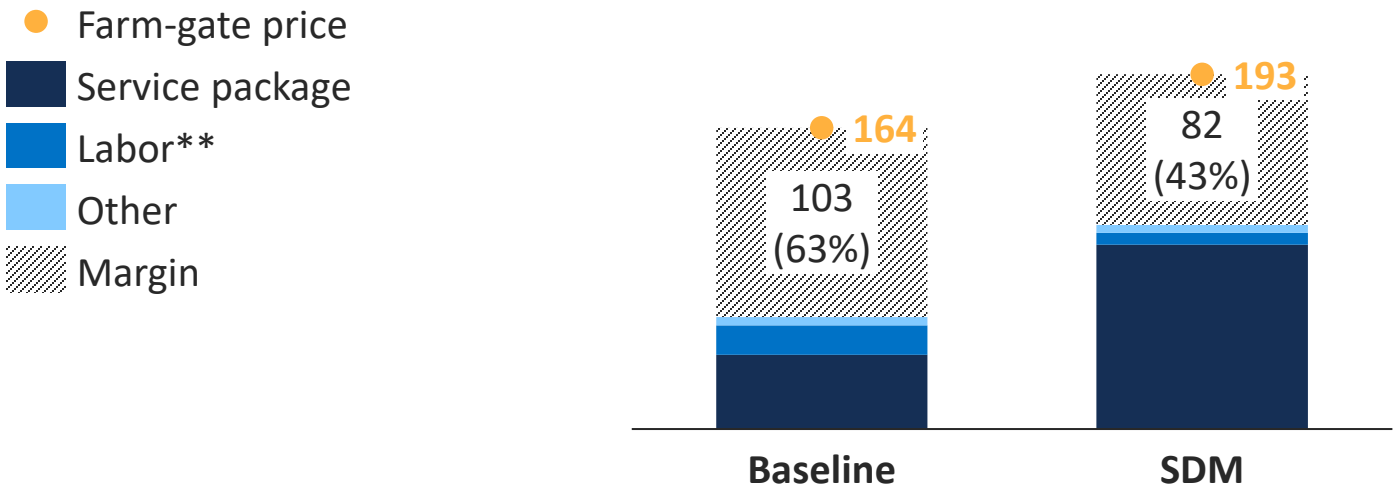
- SDM farmers need to make substantial investments in inputs and ploughing to increase yields, which is only earned back after 9 months
- The credit that farmers receive from Tamanaa to smoothen their cashflow is crucial. Although this credit comes at a cost of $23 (9% of total costs), it allows them to actually make these required investments that are needed to reach their potential yield
- As a result, SDM farmers are better off than baseline farmers. However, they still incur costs for equipment leaving them (slightly) cash-strapped from April until November. Tamanaa should explore if this is a barrier for farmers and support if needed

** It is important to note that the projected farmer cashflows do not factor in household expenses such as school fees, medical expenses etc. These expenses could lead to a different result if considered.*

Impact case | Crop profitability

Although the performance for SDM farmers is much better on a per acre basis, they perform worse on a per MT basis. This puts pressure on farmers to reach the higher yields that they are expected to achieve

Total production cost in USD per MT and % of farm-gate price, 2021 prices*



	Baseline	SDM
Marketable surplus (kg/acre)**	**490**	**1,190**
Profit (USD/MT)	**103**	**82**
Profit (USD/acre)	**50**	**97**
Profit margin (%)	**63%**	**42%**
Profit (in kg produce/acre)	**308**	**504**

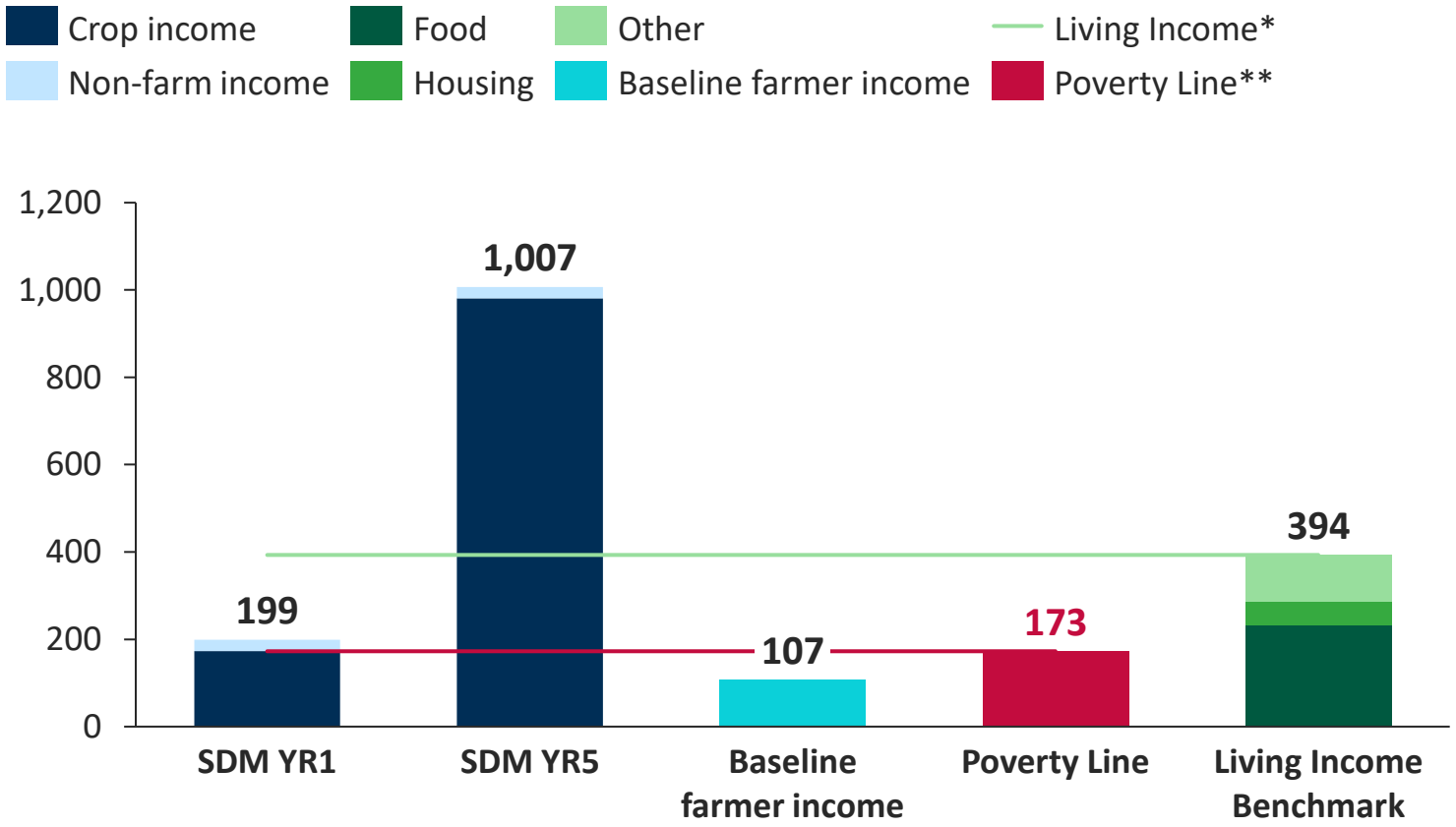
- Although the profit per acre for SDM farmers is almost twice as much as that of baseline farmers, the profit per MT is actually lower for SDM farmers, with a profit margin of 42% compared to 63% for baseline farmers
- This is a result of the high costs of inputs and the fact that SDM farmers have not yet reached their full potential yield
- This means that it is necessary for SDM farmers to reach the much higher yields they are anticipated to achieve, in order to earn back their investment in inputs
- Therefore, it is important that Tamanaa closely monitors farmer yields and supports them to maximize those yields

** Prices and costs are converted from GHS to USD using an exchange rate of 7.6 GHS/USD*
*** Since rice farmers mainly rely on family labor, there are only costs incurred for hired harvesting labor*
**** This analysis assumes no home consumption, but in reality, around 120 kg (10% of total production) is used for home consumption*

Impact case | Gap to living income

Farmers can close the living income gap in the short term by participating in the SDM. This is highly dependent on farmers improving their yields and expanding their land sizes

Poverty and living income gap, in USD



- SDM farmers could potentially close the living income gap in their third year of participating in the SDM, unlike baseline farmers who do not achieve this even in five years
- Closing the LI gap is highly dependent on the farmer's ability to increase their yield to at least 2,000 kg/acre (based on a production area of two acres)
- Without support (financial and training), these projected yields might not be attainable
- Increasing farm size alone is not sufficient for SDM farmers to attain a LI

**The Living Income (LI) is an approximate income needed to meet a family's basic needs including food, housing, transport, health, education, tax deductions and other necessities. The difference between the LI benchmark and actual income is referred to as the living income gap Wage Indicator (Sept 2019). The living income benchmark depicts a typical family of eight members (2 parents and 6 children)*

***Data on poverty line is obtained from Ghana Bureau of Statistics*

Annex

Annex

Farmer assumptions

Characteristics	Baseline	SDM rice farmer
Farm size | Current	2 acres	2 acres
Farm size | Potential	2 acres	3.67 acres
Yield | Current	700 kg/acre	1,400 kg/acre
Yield | Potential	700 kg/acre	2,240 kg/acre
Post harvest losses | Current	30%	15%
Post harvest losses | Potential	30%	5%
Own consumption	120 kg	120 kg
Farmgate price | high moisture (>16%)	1.50 GHS/kg	1.73 GHS/kg
Farmgate price | low moisture (<16%)	1.20 GHS/kg	1.38GHS/kg
Share of high moisture rice	15%	25%
Training	No	Yes
Seeds on credit	No	Yes
Fertilizer on credit	No	Yes
Mechanized ploughing on credit	No	Yes
Mechanized harvesting	No	Yes
Insurance	No	Yes
Cost of inputs	150 GHS/acre	890 GHS/acre

Annex

Scale and operational assumptions

Sales volumes	Unit	2018	2019	2020	2021	2022	2023	2024	2025
Outgrowers	MT/year	2,338	2,408	2,408	0	12,898	32,830	35,175	38,525
Commercial	MT/year	0	0	0	37,800	33,570	19,260	20,340	23,820
Own farm	MT/year	268	268	402	670	804	938	1,072	1,206
Open market	MT/year	0	0	3,847	13,800	20,160	16,500	13,200	6,600

Farm services	Unit	2018	2019	2020	2021	2022	2023	2024	2025
Farmers trained	Farmers/year	2,493	2,567	2,567	4,000	4,750	5,500	6,250	7,000
Seeds (Acreage serviced)	Acres/year	1,994	2,054	2,054	4,367	9,190	12,482	16,276	20,571
Fertilizer (Acreage serviced)	Acres/year	2,493	2,567	2,567	5,459	11,487	15,602	20,344	25,714
Ploughing (Acreage serviced)	Acres/year	1,247	1,284	1,284	2,729	5,744	7,801	10,172	12,857
Harvesting (Acreage serviced)	Acres/year	748	770	770	1,638	3,446	4,681	6,103	7,714

Variable	Unit	2018	2019	2020	2021	2022	2023	2024	2025
Staff number	# of staff/year	30	35	48	53	65	70	80	100
Opex	$/year								
Depreciation	$/year								

Annex

Key Performance Indicators

KPI	2021	2022	2023	2024	2025
Revenue ('000 USD)					
Rice sales (MT)	52,270	67,432	69,528	69,787	70,151
Gross margin %	30%	31%	31%	31%	31%
EBIT margin %	30%	30%	31%	31%	30%
EBIT per MT sold (USD)					
EBIT per farmer (USD)					
Commercial profit per farmer (USD)					
Service profit per farmer (USD)					
Cost to source per farmer (USD)					
Cost to serve per farmer (USD)					

Annex

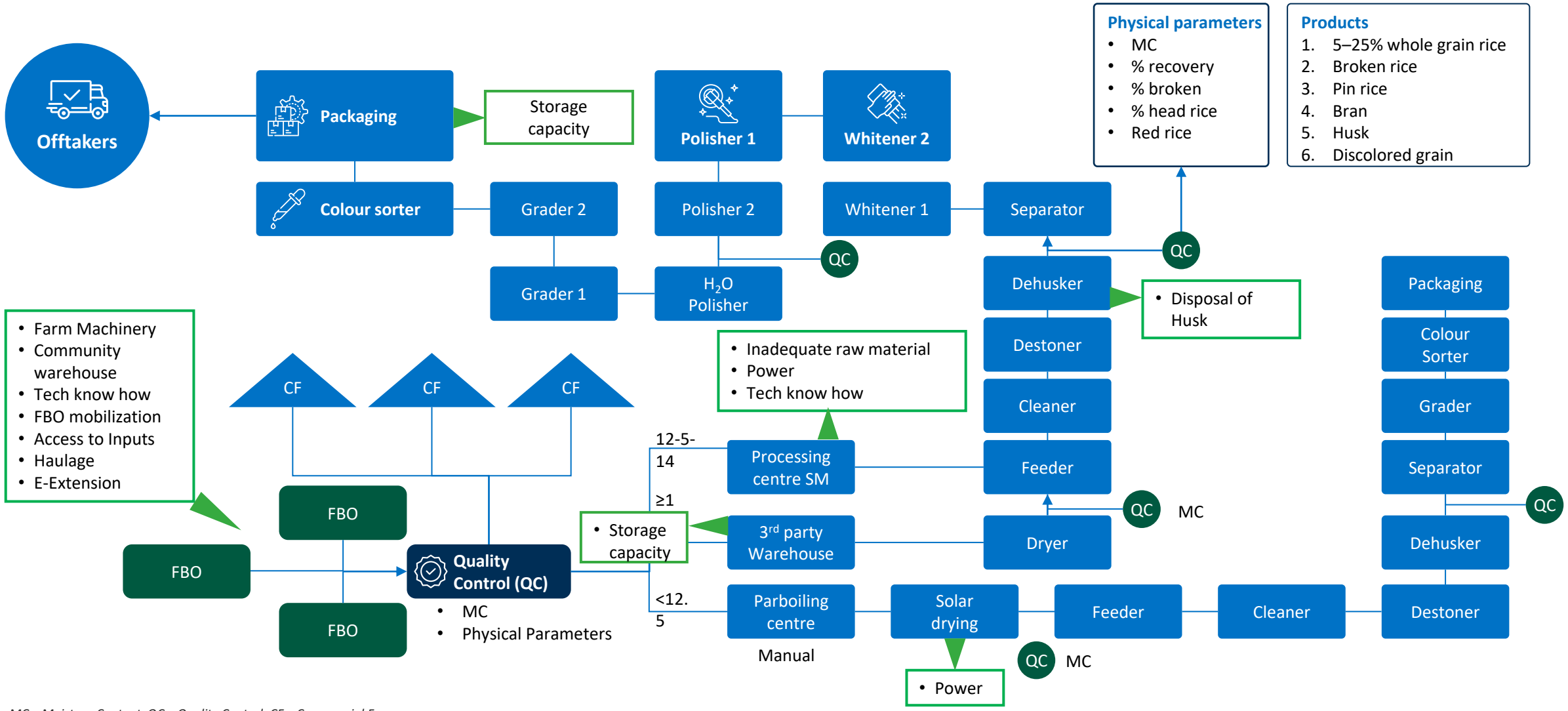
Financing assumptions

Short-term loan	Unit	Value	2018	2019	2020	2021	2022	2023	2024	2025
Seeds pre-financed	Acre		1,994	2,054	2,054	0	9,190	12,482	16,276	20,571
Seeds value	GHS/acre									
Loan tenor	Months	5								
Fertilizer pre-financed	Acre		2,493	2,567	2,567	0	11,487	15,602	20,344	25,714
Fertilizer value	GHS/acre									
Loan tenor	Months	5								
Sourcing volumes	MT		3,490	3,594	3,594	0	19,250	49,000	52,500	57,500
Sourcing value	GHS/MT									
Loan tenor	Months	2								

Capex	Unit	Value
1000-tonne capacity Warehouse	GHS	
Tractors (4) and its accessories	GHS	
Fence Wall	GHS	
Kia truck for delivery (2)	GHS	
4x4 Pick up (2)	GHS	
Combine harvester (2)	GHS	
Standby generator 1000 KVA	GHS	
Repayment rate p.a.	%	10%

Annex

Process flow of Tamanaa



MC – Moisture Content, QC – Quality Control, CF – Commercial Farmers

Source: Tamanaa Management