SDM Case Report:

Raphael Group Limited (RGL), Tanzania

Service Delivery Model Assessment
September 2019

Public report

the sustainable
trade initiative

Executive summary

Raphael Group Limited (RGL) sources, processes and sells rice, beans and other stable crops in Tanzania. RGL sources most of the rice and beans from smallholder farmers and operates an SDM to be able to better engage with them. In order to grow their business and fulfill the rice and staple crop needs of the region, RGL intends to grow this program and expand the number of farmers they work with.

RGL has a positive business case for investing in the SDM

- The study reveals that the SDM is profitable when commercial (sourcing, processing and sales) activities are taken into consideration. Over the period 2019 to 2025, RGL is projected to make cumulative net income of USD *(figure hidden)* from rice and beans sales. Operating the SDM will cost USD 17.38M for the same time period. The profits per farmer improves over time and by 2025 a rice farmer contributes to USD *(figure hidden)* and a beans farmer contributes to USD *(figure hidden)* of annual profits to RGL.
- Sourcing from smallholder farmers is a critical element of RGL's business strategy and the SDM contributes towards making their engagement with smallholder farmers effective and efficient. The SDM investments are relatively small compared to the sourcing costs (less than 10%) and hence do not add significantly RGL's business risk. On the other hand, it contributes in a significant way towards increasing farm yields and growing RGL's sourcing base.

Rice and beans farmers can receive significant benefits from participating the SDM

- A rice farmer who has been in the SDM for several years and receives all its services (including access to finance) can earn up to USD 3,099 net income per year. Beans farmers can earn up to about USD 611 per year. Most beans farmers also have many other sources of incomes and so this can be an attractive supplementary income to them.
- Being able to access loans for seeds and inputs is a key element of the model, especially for rice farmers. Farmers who do not have access to financing see significantly lower net incomes.

Note: All figures in this report are based on projections. Assumptions behind these projections can be found in the appendix section of this report.

IDH introduction

Importance of Service Delivery

Agriculture plays a key role in the wellbeing of people and planet. 70% of the rural poor rely on the sector for income and employment. Agriculture also contributes to 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.

A solid understanding of the relation between impact on the farmer and impact on the service provider’s business brings new strategies for operating and funding service delivery, making the model more sustainable, less dependent on external funding and more commercially viable.

About this study

To accelerate this process, IDH is leveraging its strength as a convener of key public-private partnerships to gain better insight into the effectiveness of SDMs. IDH developed a systematic, data-driven approach to understand and improve these models. The approach makes the business case for service delivery to investors, service providers, and farmers. By further prototyping efficiency improvements in service delivery, IDH aims to catalyze innovations in service delivery that positively impact people, planet, and profit.

Thanks

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

Reflection on SDM learning questions (1/3)

In this SDM study, a set of tailored learning questions were analyzed:

1. Who are the key actors in this SDM and what is the relationship between them?	• A partnership of different actors is needed to deliver the SDM. The partners come together as the Southern Highland Rice Consortium (SHIRCO) with **RGL taking a lead role** in this consortium. • RGL also plays the role of an **intermediary to facilitate better support** from the seeds, input and financial service provider to the farmers and farmer groups.
2. What are the costs to RGL for delivering the SDM? Can these costs be recovered?	• Between 2019 and 2025, RGL is projected to **incur costs of about USD 17.38M** to operate the SDM. This includes both direct costs related to the provision of services as well as overhead costs related to managing the program. Most services are a cost to RGL without any cost recovery mechanism. • **The only service that generates revenues is mechanization**, which will be provided from 2023 onwards. **RGL is projected to generate USD 339,000 in services revenues** from mechanization between 2023 and 2025. • Mechanization has the potential to be a profitable business unit for RGL if it scales up its operations. For example, if RGL **scales up its mechanization unit to be able to service 20% of its rice and beans farmers, it can earn (net income) USD 484,000 per year** from 2025 onwards. However, this will involve significant capital investments to buy 14 combine harvesters, 8 tractors and 6 mobile beans dryer by 2025.
3. Is the SDM financially viable and what are the key factors influencing this?	• The SDM by itself is mostly a cost center and, except for mechanization, there is no direct cost recovery for any other service. However, when the sourcing, processing and sales of rice and beans is considered the SDM is profitable in all years of operation. **The business is projected to earn a cumulative net income of USD** *(figure hidden)* **between 2019 and 2025.** Nearly all of this (about USD *figure hidden*) comes from the sourcing and processing of rice, with beans accounting for only a small portion of the income. • **RGL is projected to earn a net income of USD** *(figure hidden)* **per rice farmer per year by 2025.** Beans farmers contribute significantly less at about USD *(figure hidden)* per farmer per year by 2025
4. Who are the main beneficiaries of the SDM and how is value distributed amongst them?	• The **biggest beneficiary group is the farmers** who stand to make a **cumulative net income of USD** *(figure hidden)* between 2019 and 2025. • **Input providers and the bank (lender)** also benefit from the SDM with **cumulative net incomes of about USD** *(figure hidden)* **and** *(figure hidden)* respectively over the same period.

Reflection on SDM learning questions (2/3)

In this SDM study, a set of tailored learning questions were analyzed:

5. Can RGL scale the SDM to reach 30,000 farmers? What is needed and what are the barriers to achieving this?	• RGL can scale the SDM to reach 30,000 farmers by expanding its operations beyond Mbeya and in to the Morogoro district. Most of the growth will come through addition of new rice farmers. • Ensuring that the rice farmer groups are **eligible and can access loans is a critical factor** to scaling the model sustainably and profitably. By 2025 rice farmers will need to **collectively access about USD 8.7M in loans annually.** • By 2025, RGL is projected to be **producing about 77,000MT** of rice annually. RGL currently only has about 67,000MT / year of processing capacity (including the 4th new mill in Morogoro). Hence, a decision needs to be made on either managing growth or increasing processing capacity by 2024.
6. Is there a business case for farmers accessing finance? How can this be facilitated	• There is a strong business case for rice farmers to access loans. **A segment 2 rice farmer (who receives loans) can realize a net income of USD 3,099** after 7 or 8 years in the SDM. A segment 1 farmer (without loans) only realizes a net income of USD 1,262 after the same period in the SDM. This is only marginally higher than a baseline farmer and hence segment 1 should only be a steppingstone to get farmers eligible for loans and not a long-term solution. • Since banks only lend to farmers through farmer groups, **ensuring that farmer groups are officially registered and have required documentation** in place is critical to facilitating access to finance. This can be achieved through the support of consultants who provide this service. **An investment of USD 120,000 – 150,000 will get about 50 farmer groups registered** and approved for loans. • Beans farmers do not receive any loans. However, a case could be made for segment 2 beans farmers (using hybrid varieties) to be included in the finance scheme through a similar mechanism as segment 2 rice farmers.
7. Should RGL provide mechanization services and what is the business case for doing so?	• There is strong demand for mechanized land preparation (tractors) and harvesting (combine harvesters) from rice farmers. • Mechanization can be a profitable business unit for RGL. For example, if RGL **scales up its mechanization unit to be able to service 20% of its rice and beans farmers, it can earn (net income) USD 484,000 per year** from 2025 onwards.

Reflection on SDM learning questions (3/3)

In this SDM study, a set of tailored learning questions were analyzed:

8. How does the SDM contribute to farmer income and cashflow?	• **The impact of the SDM on segment 1 rice farmers is small**. Segment 1 farmers have almost the same net income as baseline farmers in the first few years of participating in the SDM. By year 5 their income is about 35% higher than the baseline as a result of higher adoption of GAP. • Segment 2 rice farmers benefit significantly more from the SDM. **Their net income in the first year of participation is over 170% higher than that of the baseline and 270% higher 5 years into SDM participation**. This is primarily because they receive GAP training, which they are then able to use since they have access to loans to procure good quality seeds and inputs. • Segment 2 rice farmers also have more favorable cash flows. Their net cash outflow is small since they receive all seeds and inputs on credit which only needs to be paid back after harvest. • Beans farmers also display a similar pattern with segment 2 benefitting much more than segment 1.
9. Does the SDM contribute to increased food security and nutrition for farmers? For the region?	• Both rice and beans farmers keep a portion of their production for family consumption. As the SDM contributes to increased production they can keep more for themselves while also having more to sell. • The **SDM contributes towards production of about 103,000MT of rice by 2025**. About 80% of it will be sold for domestic consumption contributing to food security within Tanzania. The remaining 20% will be exported to Malawi, Zambia and the DRC contributing to food security in those countries.

Reading guide

In this document we present the findings of our study. You can navigate through the document by clicking on the index.

In this document you will:

- ✓ Understand what SDMs are
- ✓ Get a complete overview of the flows of goods, money and services in your SDM
- ✓ Analyze in depth all the implications of the different services
- ✓ Have a clear understanding of the financial performance of the SDM
- ✓ Get insights on the farmer business case

Contents

Overview of SDM stakeholders & objectives
Services, scale and organization of the SDM
Farm-level impact
Business impact
Regional impact
Conclusions
Opportunity pathways
Annex

Overview of SDM stakeholders and objectives

This chapter provides a general introduction to the SDM partner and other relevant actors, as well as the SDM objectives and context.

In this section you will:

- ✓ Learn the basics about the SDM operator
- ✓ Understand the value chains involved
- ✓ Get an overview of the stakeholders involved in the SDM
- ✓ Understand the objectives of this SDM

Overview of SDM stakeholders & objectives

Services, scale and organization of the SDM

Farm-level impact

Business impact

Regional impact

Conclusions

Opportunity pathways

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RGL background and context

SDM Operator

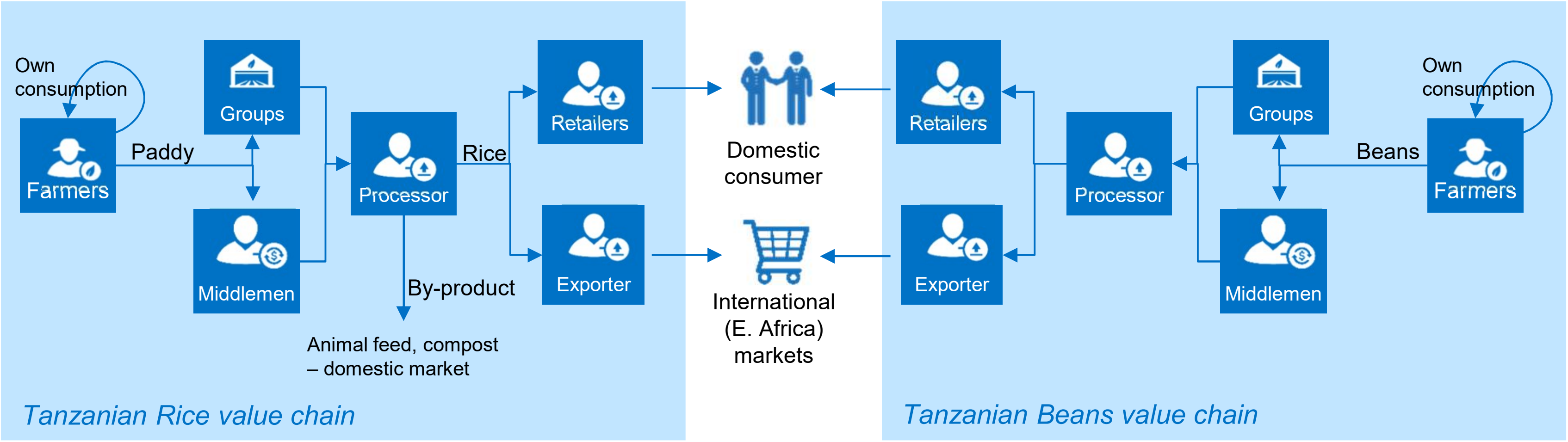
- Raphael Group Limited (RGL) is a food grains processors and distributor in the Mbeya region of Tanzania.
- RGL's core business activity is the sourcing, processing and distribution of rice. RGL is also active in the beans, groundnuts, sunflower oil and cereals value chains.
- RGL sources rice from about 7,000 smallholder farmers and beans from about 6,000 smallholder farmers in the Mbeya region. RGL is also exploring expanding to the Morogoro region to expand its rice sourcing base.
- RGL has invested in setting up rice milling facilities with a capacity of 190MT per day, 4 warehouses with 15,000MT of storage capacity, rice retail centers in Mbeya and Dar es Salaam and 30MT trucks for transporting the goods.
- About 80% of the white rice RGL produces is sold within Tanzania. The remaining is exported to Malawi, Zambia and DRC.

SHIRCO - Value Chain Consortium

- RGL is a lead member of the Southern Highland Rice Consortium (SHIRCO)**,** a consortium of value chain actors working to promote rice production and trade in the region.
- Other members of SHIRCO include Agriseed Tech. Ltd (improved seeds company), Yara Tanzania Ltd (fertilizer company), Obo Investment Co. Ltd (On farm chemicals company), Ministry of Agriculture Training Institute (government training institute), Khebandza Marketing Ltd (marketing service company), Business Development Service consultant (BDS), and Kilimo Trust.
- With the support of SHIRCO, RGL facilitates availability of high-quality seeds and fertilizers to smallholder farmers in the region.
- Seeds and inputs are available to smallholder farmers on credit through cooperatives. RGL facilitates the financing of these cooperatives by working with NMB.

Sources: Raphael Group interview Kilimo Trust, 2013, FAOSTAT, 2014 FAO (2018) Pulse crops for sustainable farms in sub-Saharan Africa; 5) The United Republic of Tanzania (2017)

Context – Rice and beans value chains in Tanzania


Own consumption
Farmers
Paddy
Groups
Middlemen
Processor
Rice
Retailers
Exporter
By-product
Animal feed, compost – domestic market
Tanzanian Rice value chain
Domestic consumer
International (E. Africa) markets
Retailers
Exporter
Processor
Groups
Middlemen
Beans
Own consumption
Farmers
Tanzanian Beans value chain

- Rice is the second most produced cereal crop in Tanzania and is grown by about 1.68 million farmers. The main rice growing regions are Tabora, Morogoro, Mbeya and Arusha.
- The rice-growing area rose from 439,300 hectares in 1997 to 720,000 hectares in 2014 of which 90% is managed by small-scale farmers with holdings of 0.5 to 3.0 acres of land each. Rice production has grown by 13.1% per year over the same period.
- The Government of Tanzania has prioritized rice through its national Rice Development Strategy (NRDS) which aims to double rice production by 2020 in order to improve food security and provide the possibility of export to neighboring countries.
- Demand for rice in Tanzania is projected to triple by 2020, and a substantial — and growing — deficit is forecast (from 1.15 million tonnes in 2009 to 2.84 million tonnes in 2020). These trends are expected to continue past 2025.

- Tanzania is a leading producer of beans in East Africa (1.02 million MT) followed by Uganda (0.88 million MT), Kenya (0.62 million MT), Ethiopia (0.51 million MT) and Rwanda (0.42 million MT).
- The main bean production areas in Tanzania are in the northern regions; Arusha, Kilimanjaro and Manyara, great lakes/western; Kagera and Kigoma the southern highlands; Mbeya, Iringa and Rukwa.
- Over 70% of the beans production comes from smallholder farmers with less than 5 acres of land. It is almost always produced under intercropping systems with maize or other crops.
- Beans are an important crop for smallholder farmers in Tanzania, for home consumption and cash income .The crop is an important source of protein for low-income families in rural and urban areas providing about 38% of utilisable protein and 12-16% of daily calorific requirements.

Sources: Ronner and Giller, 2013, Kilimo Trust, 2013, FAOSTAT, 2014 FAO (2018) Pulse crops for sustainable farms in sub-Saharan Africa; 5) The United Republic of Tanzania (2017) AAAS Crop and Livestock report; 6) BTC (2012) Organic Kidney Beans : potential for certified producers in Tanzania; 5) BTC (2012) Organic Kidney Beans : potential for certified producers in Tanzania; 6) Global The United Republic of Tanzania (2017)

SDM Stakeholders and Entities Overview

	Legal Status	**Function** (within this SDM)	**Revenue model** (within this SDM)	**Incentive for participation** (within this SDM)
SDM Operator				
RAPHAEL GROUP LTD RGL	Private company	• SDM operator – deliver services to farmers • Facilitation of access to finance • Sourcing and processing of paddy and beans	• Payment for mechanization services • Revenues from sales of rice and beans	• Increased quantity and quality of paddy and beans sourced from farmers
Donors				
idh the sustainable trade initiative	Public-private-partnership (Netherlands)	• None at time of study • Could prototype and co-fund development of innovative services in the future	• N/A	• Improve smallholder livelihoods • Catalyze investments in smallholder value chains
Financial Service Partners				
NMB Close to you	Private company	• Provide loan to farmers for purchasing inputs and production expenses	• Interest rates on loans	• Attract new agri customers • Provide value-add service to farmers

SDM Stakeholders and Entities Overview

	Legal Status	Function (within this SDM)	Revenue model (within this SDM)	Incentive for participation (within this SDM)
Value Chain Partners				
YARA	Private company	• Provide fertilizers to farmers	• Payment for fertilizer	• Increased sales of fertilizer
Agriseeds Technology Limited	Private company	• Stock and provide seeds to farmers	• Payment for seeds	• Increased sales of seeds
Rogimwa Agro Company Limited	Private company	• Provide agro-chemicals and farm implements to farmers	• Payment for agro-chemicals and farm implements	• Increased sales of agro-chemicals and farm implements

SDM Structure: Services, scale and organization of the SDM

This section provides information about the services delivered to the farmers, the number of farmers in the SDM and the way they are organized.

In this section you will:

- ✓ Get an overview of the services provided
- ✓ Get a breakdown of the dynamics and flows per service, as well as the delivery method, costs and impact
- ✓ Get an overview of the SDM scale in terms of number of farmers
- ✓ Understand the farmer segmentation used for targeting

Overview of SDM stakeholders & objectives

Services, scale and organization of the SDM

Farm-level impact

Business impact

Regional impact

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Opportunity pathways

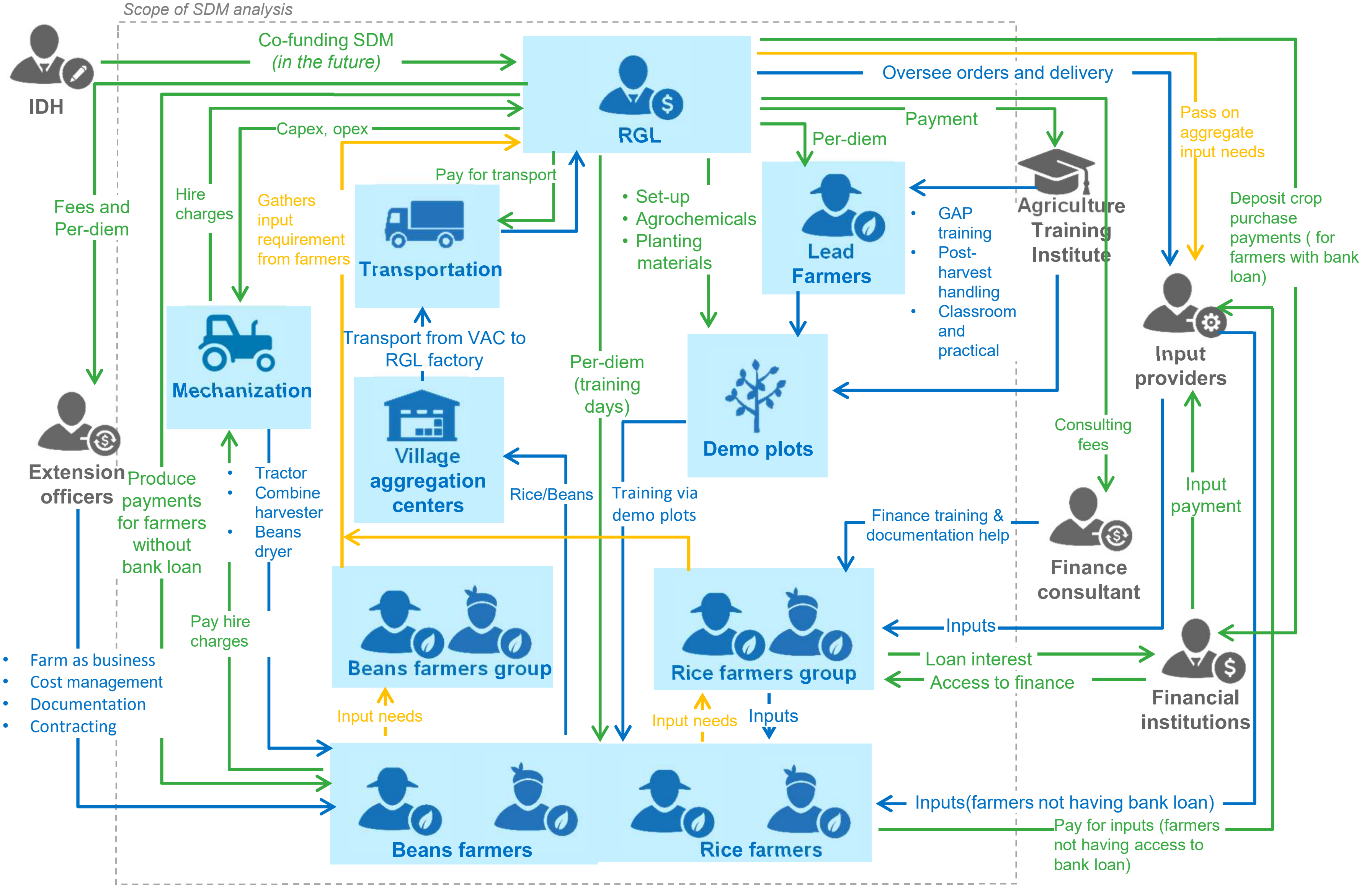
Annex

SDM Services and Revenue Flow Overview

Legend

← Flow of goods and services

→ Financial / payment flows



Scope of SDM analysis

IDH

Co-funding SDM *(in the future)*

RGL

Oversee orders and delivery

Pass on aggregate input needs

Payment

Per-diem

Capex, opex

Pay for transport

Fees and Per-diem

Hire charges

Gathers input requirement from farmers

Transportation

- Set-up
- Agrochemicals
- Planting materials

Lead Farmers

- GAP training
- Post-harvest handling
- Classroom and practical

Agriculture Training Institute

Deposit crop purchase payments (for farmers with bank loan)

Input providers

Mechanization

Transport from VAC to RGL factory

Per-diem (training days)

Demo plots

Consulting fees

Extension officers

Produce payments for farmers without bank loan

- Tractor
- Combine harvester
- Beans dryer

Village aggregation centers

Rice/Beans

Training via demo plots

Finance training & documentation help

Finance consultant

Input payment

Pay hire charges

Beans farmers group

Rice farmers group

Inputs

Loan interest

Access to finance

Financial institutions

- Farm as business
- Cost management
- Documentation
- Contracting

Input needs

Input needs

Inputs

Beans farmers

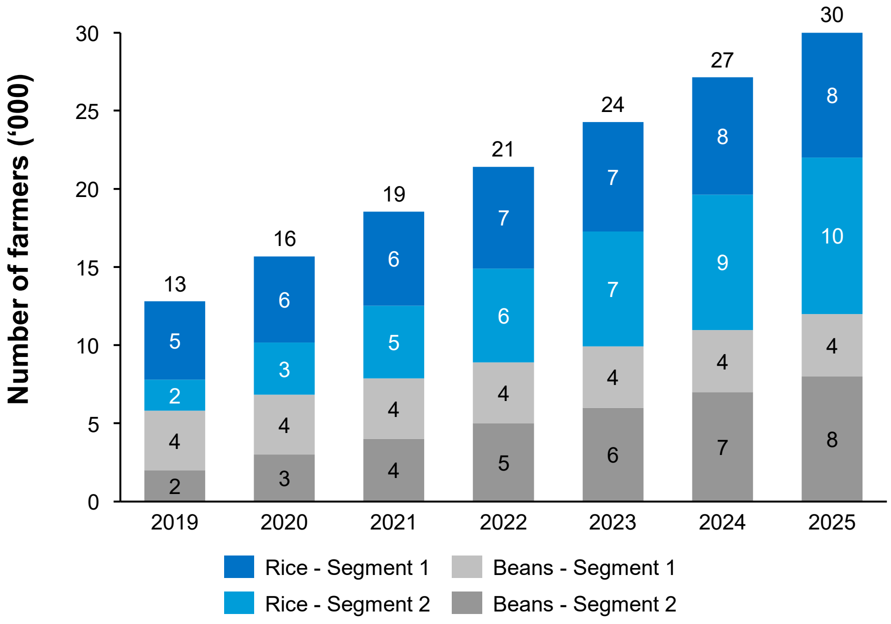
Rice farmers

Inputs(farmers not having bank loan)

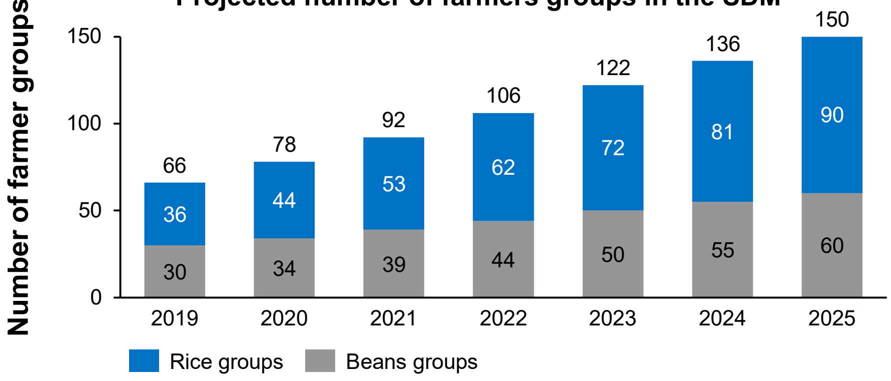
Pay for inputs (farmers not having access to bank loan)

Scale of the SDM and duration in scope of this case study

Projected number of farmers in the SDM



Projected number of farmers groups in the SDM



Discussion

- RGL expects to more than double the number of farmers it sources from over the next few years in order to meet its business projections, with rice farmers accounting for most of the growth.
- Most of the expansion in rice is expected to be in the Morogoro region with 8,000 of the 11,000 new rice farmers coming from there.
- Out of the total 18,000 rice farmers by 2025 at least 10,000 farmers are expected to receive loans and be considered as "Segment 2" SDM farmers.
- Nearly all of the growth in beans farmers comes through addition of "Segment 2" farmers who grow hybrid beans varieties.
- In order to source from these farmers RGL will need to work with around 150 farmer groups by 2025.
- The size of each group is expected to remain roughly the same with an average of 200 farmers per group.

Overview of SDM Services

Farmer Training

- Farmers receive training on GAP and financial literacy. These are done through a combination of internal and external trainers and demo plots are used.

Access to finance

- Farmers receive seeds and inputs on credit as well as cash loans for production expenses. Banks provide loans to farmer through the farmer groups.

Seeds and input provision

- RGL arranges for farmers to receive good quality seeds and inputs through negotiated arrangements with distributors. Some farmer segments receive inputs on credit.

Village aggregation centers

- RGL builds and operates village aggregation centers (VAC) to provide safe storage space for farmers produce. These also serve as buying centers for beans.

Transportation

- RGL transports rice and beans from the aggregation centers to its warehouses and milling facilities. This is currently done using rented trucks but RGL plans to buy trucks in the future.

Mechanization

- RGL plans to provide mechanization services for land preparation and harvesting in the future. These will be paid services and generate revenues for RGL.

Farmer segmentation

Minimum criteria

Beneficiaries should meet the following minimum criteria in order to be eligible for service provision

	Rice farmers *Segment 1*	Rice farmers *Segment 2*	Beans farmers *Segment 1*	Beans farmers *Segment 2*
Farmer organization	All farmers must be part of local (informal) groups			

Segments

Segments are distinct groups of SDM beneficiaries that differ on ***farm characteristics****[1)] and/or* ***services received***

Characteristics		Rice farmers *Segment 1*	Rice farmers *Segment 2*	Beans farmers *Segment 1*	Beans farmers *Segment 2*
	Crop	Paddy/Rice	Paddy/Rice	Beans	Beans
	Crop farm size (2019)	3 acres		1 acre	
	Crop farm size (2027)	3 acres	3 acres	1 acre	1 acre
	Primary crop	Yes	Yes	No	No
	Irrigation	Limited	Yes	No	No
	Adoption rates	40%	100%	70%	70%

Services

Each SDM consists of a unique combination of services, based on farmer needs and expected willingness to adopt

Services		Rice farmers *Segment 1*	Rice farmers *Segment 2*	Beans farmers *Segment 1*	Beans farmers *Segment 2*
	Inputs usage	Limited	Per recommendation	Limited	Limited
	Seeds variety	High yielding	High yielding	Local	Hybrid
	Mechanization	Limited	Full	Limited	Limited
	Finance	No	Bank loan	No	No

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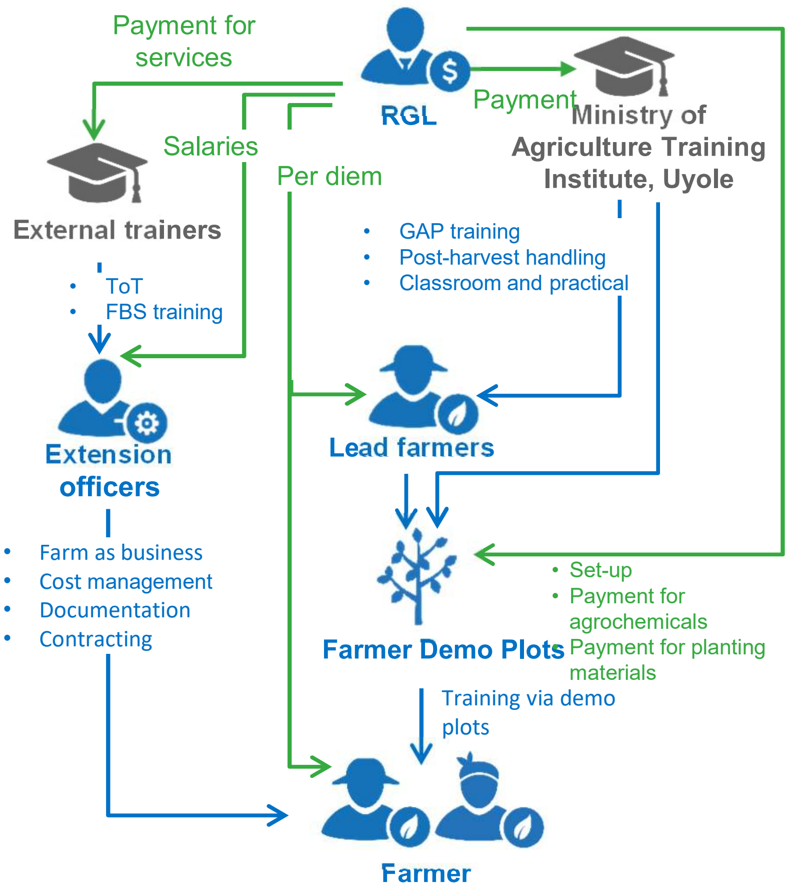
Detailed overview of **training**


Payment for services
RGL
Payment
Ministry of Agriculture Training Institute, Uyole
Salaries
Per diem
External trainers
ToT
FBS training
GAP training
Post-harvest handling
Classroom and practical
Extension officers
Lead farmers
Farm as business
Cost management
Documentation
Contracting
Set-up
Payment for agrochemicals
Payment for planting materials
Farmer Demo Plots
Training via demo plots
Farmer

Legend
- Flow of goods and services
- Financial / payment flows
- Information flows

Description / Methodology

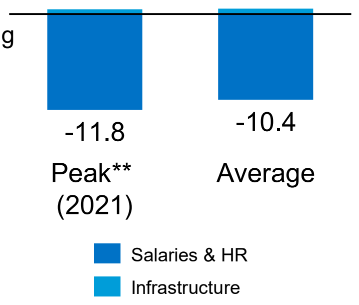
- RGL pays ministry of agriculture training institute for training agronomists and lead farmers every year (training of trainers). RGL bears all other costs related to the training including transport, stay, food and per diem of all participants.
- Paddy farmers receive 7 GAP trainings per season (beans farmers receive 3 GAP trainings), encompassing all farming stages, namely from land preparation to harvesting. Farmer are trained in groups of around 90-100 farmers.
- GAP training is provided two times (one per year) during the first two years when farmers join the SDM.
- The GAP training is offered through the demo plot. The demo plot is a 1.0-acre farm located in the land of lead farmers or exclusively leased. RGL provides agro-inputs (fertilizers, pesticides and seeds) for the demo plot and farmers provide labor. The harvest from the demo plot are shared equally between farmer group and RGL.
- Trained extension officers provide farmer business school trainings to farmers joining SDM on Financial and Business skills. These trainings are provided in common places (e.g. public schools, churches etc).

Service costs (from perspective of RGL)

Description
- RGL pays for all salaries of RGL employees.
- RGL pays trainers from Ministry of Agriculture for both ToT and demo plot trainings
- RGL pays per diem for farmers attending training and provides training materials
- RGL covers set-up costs of demo plots and provides agri-inputs (fertilizers, pesticides and seeds) for demo plot.

Drivers
- The main cost driver is fees paid to Ministry of Agriculture trainers.

Training expenses per farmer per year (USD/farmer)*

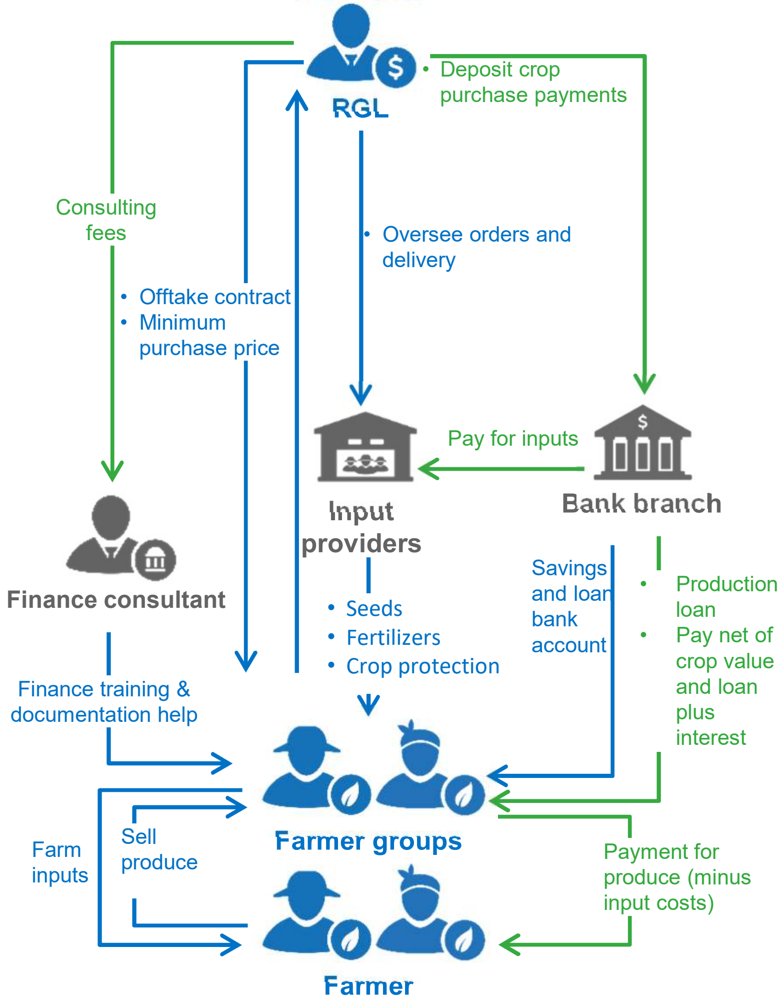


*Takes into account all SDM farmers receiving the services.
**Year of highest cost or lowest net income

Impact

- Better application of good agricultural practices resulting in higher yields and quality.
- Higher and more resilient income for farmers due improved production.
- Higher sourcing volumes of rice and beans for RGL resulting in increased business revenues and profits.

Detailed overview of **access to finance**



RGL

- Deposit crop purchase payments

Consulting fees

- Oversee orders and delivery

- Offtake contract
- Minimum purchase price

Input providers

Pay for inputs

Bank branch

Finance consultant

- Seeds
- Fertilizers
- Crop protection

Savings and loan bank account

- Production loan
- Pay net of crop value and loan plus interest

Finance training & documentation help

Farmer groups

Farm inputs

Sell produce

Payment for produce (minus input costs)

Farmer

Legend ← Flow of goods and services

→ Financial / payment flows

→ Information flows

Description / Methodology

- RGL facilitates farm groups to access bank loans.
- Southern Highland Rice Consortium (SHIRCO) consisting of RGL, input providers (Agriseeds Ltd, Yara Tanzania) facilitates distribution of required inputs.
- A memorandum of understanding (MOU) is signed between SHIRCO, farmer groups and participating banks for providing inputs on bank credit.
- RGL signs purchase and sell contract with farmer groups for guaranteed uptake(by RGL) and quantity to sell (by farmer group).
- RGL issues warehouse receipts against the farm produce stored in its warehouses and farmer groups can use such receipts to avail credit from banks.
- RGL plans to hire an external consultant to help farmer groups in preparing documentation and other procedures required for availing bank loans.
- RGL does not assume any credit risk in facilitating of bank loans to farmer groups.
- Bank loans provides both credit for inputs and cash disbursal for production expenses.

Service costs (from perspective of RGL)

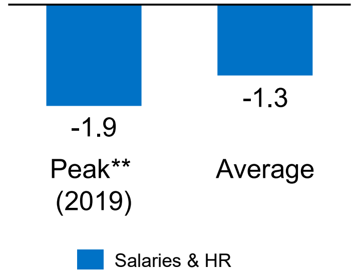
Description

- RGL pays the salaries of RGL project staff.
- RGL pays financial consultant a fixed fees of 7 million TZS for first time approval of bank loan to a farmer group.
- RGL does not hold any financial risks in case of default.

Drivers

- The main cost driver is fees paid to external consultant.

Expenses per farmer per year (USD/farmer)*



*Takes into account all SDM farmers receiving the services.
**Year of highest cost or lowest net income

Impact

- Farmers can access and afford high quality seeds and inputs,
- High quality inputs increase farm yield, quality and hence increases farmer income.
- Smoothen farmer cash flow variations during the year.

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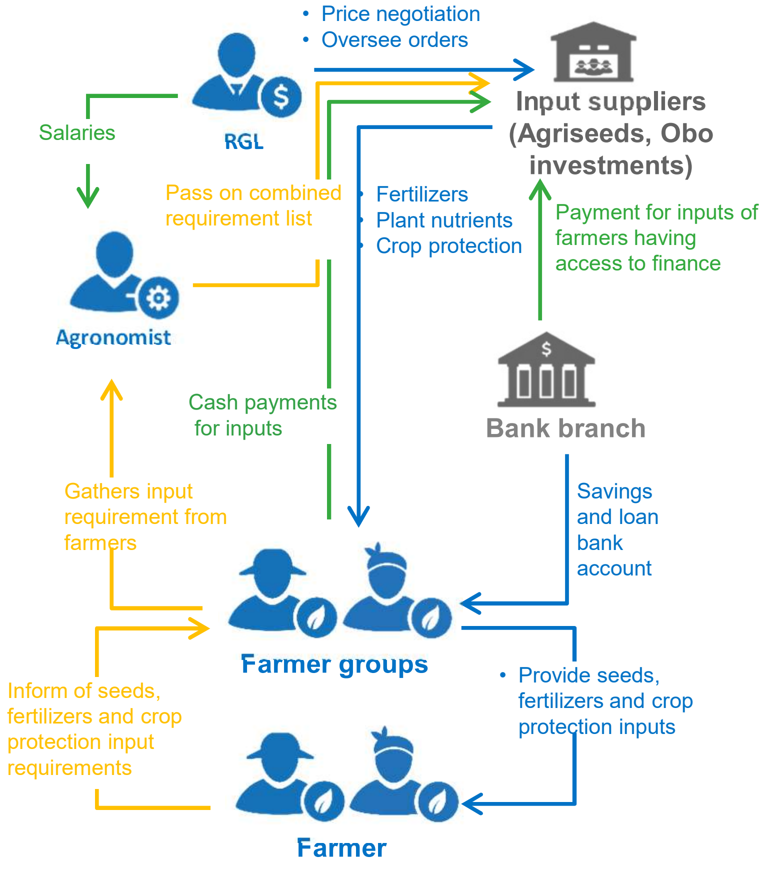
Detailed overview of **seeds and inputs provision**



- Price negotiation
- Oversee orders

RGL

Salaries

Input suppliers (Agriseeds, Obo investments)

Pass on combined requirement list

- Fertilizers
- Plant nutrients
- Crop protection

Payment for inputs of farmers having access to finance

Agronomist

Cash payments for inputs

Bank branch

Gathers input requirement from farmers

Savings and loan bank account

Farmer groups

Inform of seeds, fertilizers and crop protection input requirements

- Provide seeds, fertilizers and crop protection inputs

Farmer

Legend

- ← Flow of goods and services
- → Financial / payment flows
- → Information flows

Description / Methodology

- Farmers are provided with high quality seeds. Seeds are provided on credit to farmers that are approved for a bank loan.
- Farmers are provided with high quality crop protection and fertilizer products for paddy and beans. Agrochemicals are provided on credit to farmers that are approved for a bank loan.
- Farmers without access to bank loan pay cash for delivery of inputs.
- RGL negotiates the price of inputs with respective input providers, farmer representatives are present during price negotiation.
- Paddy and beans farmers in segment-2 use seeds supplied by seeds dealers.
- Farmer groups meet and finalize a list of seeds, fertilizers and crop protection requirements from each of the farmers and then pass it on to RGL agronomist.
- RGL staff provides the consolidated list of inputs requirements to Agriseeds ltd, Obo investments and other input providers. RGL agronomist oversees delivery of orders on the ground and RGL office staff co-ordinates with input providers in case of any issues.
- RGL does not get commission or any other form of income from facilitation of seeds and inputs provision

Service costs (from perspective of RGL)

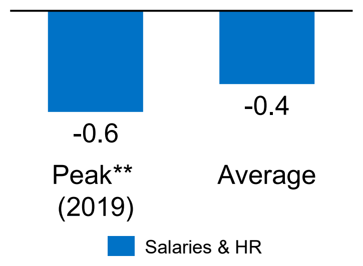
Description

- RGL pays the salaries of RGL project staff.
- RGL does not bear any other cost related to this service.

Drivers

- The main cost driver is RGL staff salaries.

Expenses per farmer per year (USD/farmer)*



*Takes into account all SDM farmers receiving the services.
**Year of highest cost or lowest net income

Impact

- Improved yields due to the use of high-quality seeds and fertilizers.
- Reduce risk of crop failure due to pests and diseases
- Negotiated prices reduce cost of inputs and thereby increase farmer profitability

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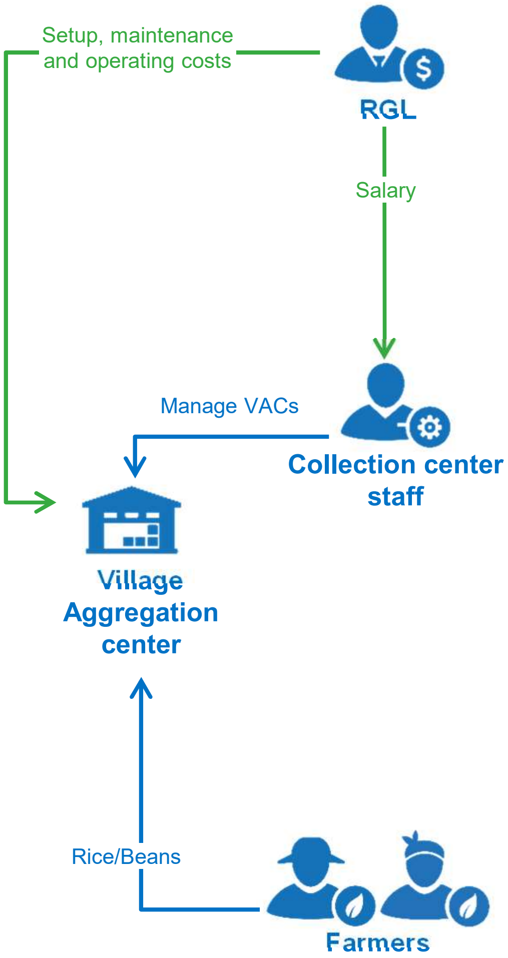
Detailed overview of **village aggregation centers**


Setup, maintenance and operating costs
RGL
Salary
Manage VACs
Collection center staff
Village Aggregation center
Rice/Beans
Farmers

Legend
- Flow of goods and services
- Financial / payment flows
- Information flows

Description / Methodology

- RGL builds and operates village aggregation centers (VAC) to provide safe storage space for farmers produce. VACs reduce the risk of spoilage from adverse weather and pests.
- Each collection center can store up to 200-300 MT.
- Each VAC is manned by dedicated staff for record keeping, ensuring security and safe storage.
- Farmers get access to digital weighing scales for accurately weighing and storing their produce.
- Farmers can use tarpaulins at the VACs for cleaning and drying their produce.
- Farmers receive warehouse storage receipt from RGL that can be produced at bank for availing input credit facility.

Service costs (from perspective of RGL)

Description
- RGL pays for construction and equipment of VAC.
- RGL pays the salaries of dedicated VAC staff.
- RGL pays the salaries of RGL project staff.

Drivers
- The main cost driver is construction costs and equipment in the VAC.

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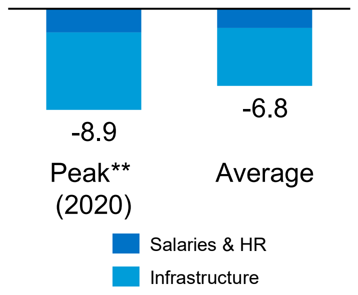
Expenses per farmer per year (USD/farmer)*

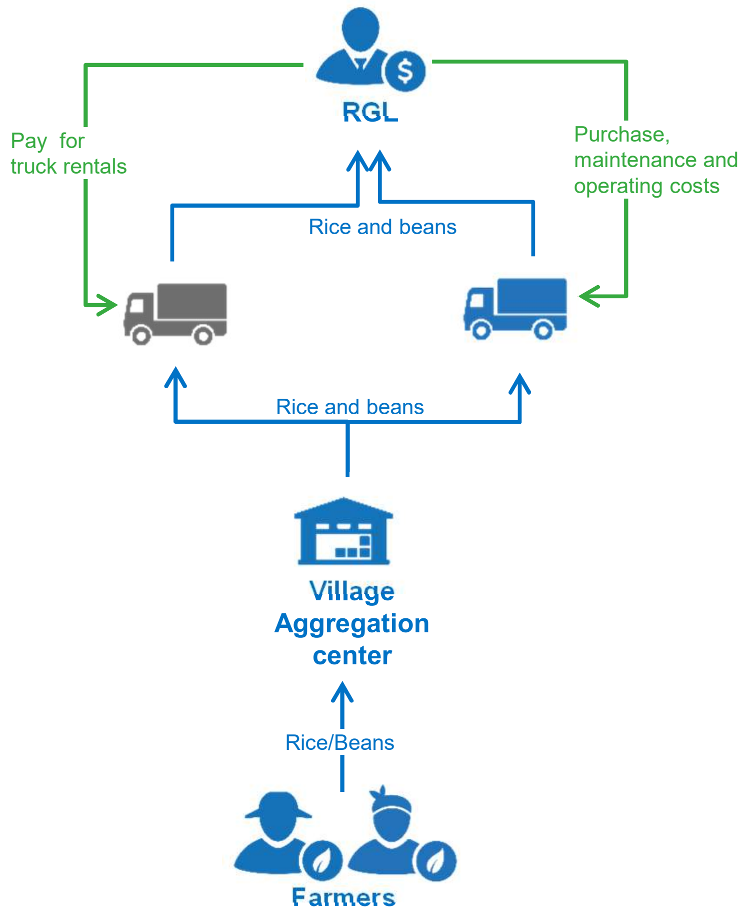


*Takes into account all SDM farmers receiving the services.
**Year of highest cost or lowest net income

Impact

- Higher prices through storage and able to sell in favorable season.
- Reduced risk of spoilage and reduced wastage from pests.

Detailed overview of **transportation**



RGL

Pay for truck rentals

Purchase, maintenance and operating costs

Rice and beans

Rice and beans

Village Aggregation center

Rice/Beans

Farmers

Legend ← Flow of goods and services

→ Financial / payment flows

→ Information flows

Description / Methodology

- RGL transports paddy and beans stored at VACs to its factory in Uyole (and Morogoro in the future).
- Currently, RGL hires trucks for transportation. However, from 2020, RGL plans to purchase a few trucks for meeting some of the transport requirements.
- Farmers do not pay for transportation from VAC to RGL factory.

Own trucks:

- From year 2020 RGL plans to own 2 trucks of 10MT capacity, adding one new truck each year and eventually have 6 trucks by 2023.
- Paddy/beans are loaded into trucks at VACs and transported to RGL factory in Uyole – each trip covers an average distance of 140KMs.
- Trucks are utilized for transporting both paddy and beans – trucks are used 60% of the year for transport from VACs (aided by different harvest seasons of both crops). During other times, trucks are utilized for transporting processed rice/beans to distributors/retailers.

Rental trucks:

- Rents are paid per 120kg bag, per kilometer.

Service costs (from perspective of RGL)

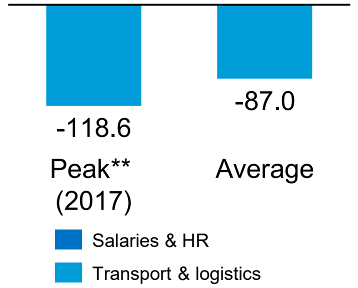
Description

- RGL incurs costs for purchase, maintenance and operating own trucks.
- RGL pays rental costs for hiring transport trucks.
- RGL pays the salaries of dedicated transport staff.

Drivers

- Currently, the main cost driver is rental costs of hired trucks.

Expenses per farmer per year (USD/farmer)*



*Takes into account all SDM farmers receiving the services.
**Year of highest cost or lowest net income

Impact

- No transport cost burden on farmer and hence higher farmer income.
- Professional transport reduces damage to produce thereby reducing wastage.

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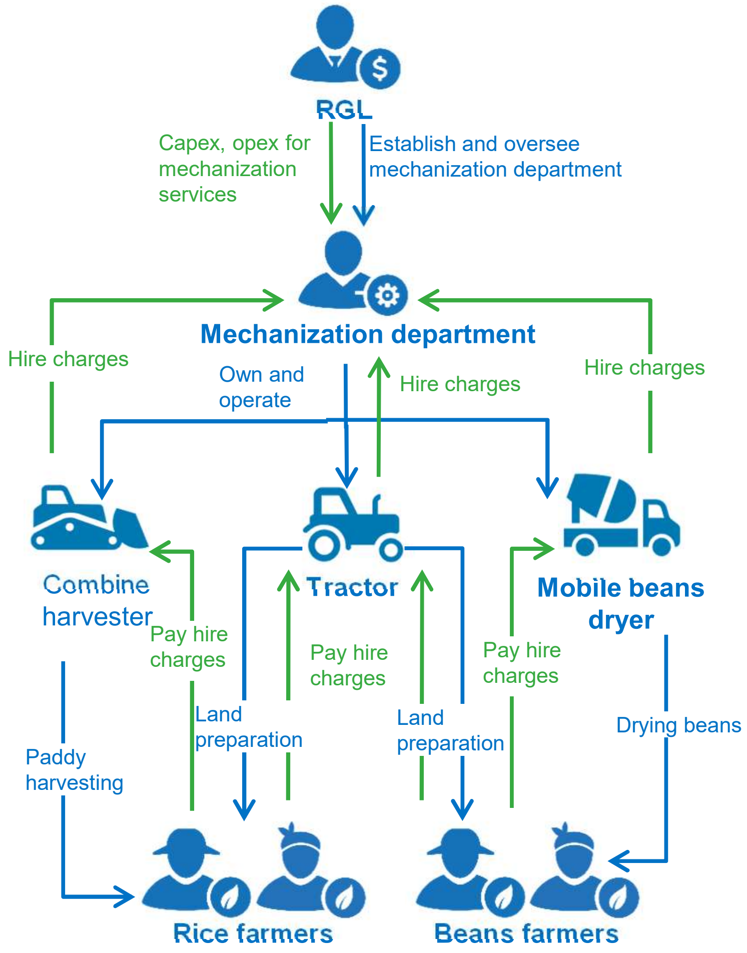
Detailed overview of **mechanization**



RGL

Capex, opex for mechanization services

Establish and oversee mechanization department

Mechanization department

Hire charges

Own and operate

Hire charges

Hire charges

Combine harvester

Tractor

Mobile beans dryer

Pay hire charges

Pay hire charges

Pay hire charges

Land preparation

Land preparation

Paddy harvesting

Drying beans

Rice farmers

Beans farmers

Legend
← Flow of goods and services
→ Financial / payment flows
→ Information flows

Description / Methodology

- From year 2023, RGL plans to purchase and operate a combine harvester for paddy, a mobile beans dryer for beans crop and 2 tractors for land preparation.
- RGL intends to create a separate department for mechanization and operate it as an independent function.
- Farmers pay market rates for hiring of the RGL machines.
- Availability of RGL machines mitigate the acute crunch in the market for hiring farm machines by farmers, particularly during peak season.
- By addressing mechanization demand-supply gap, surge pricing by other machine operators will reduce.

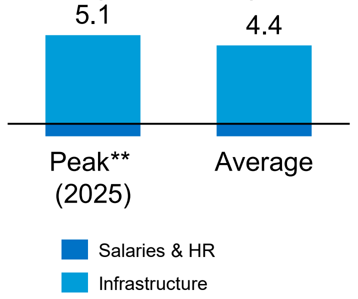
Service costs (from perspective of RGL)

Description
- RGL pays for purchase, maintenance and operating of tractors, combine harvester and mobile beans dryer.
- RGL pays the salaries of dedicated mechanization staff.
- RGL pays the salaries of RGL project staff.

Drivers
- The main cost driver is purchases, maintenance and operating of the farm machines.

*Takes into account all SDM farmers receiving the services.
**Year of highest cost or lowest net income

Expenses per farmer per year (USD/farmer)*



Impact

- Increased quality of harvest and hence higher price.
- Lower cost per acre than manual harvesting resulting in higher income.
- Reduced risk of delays in land preparation and harvesting.

Farm-level impact

This chapter presents the analysis at farmer level.

In this section you will:

- ✓ Understand the P&L of the farmers in the SDM according to their segment
- ✓ Understand how relevant factors (e.g. market price, quality, input adoption, yield) impact the farmer business case

Overview of SDM stakeholders & objectives

Services, scale and organization of the SDM

Farm-level impact

Business impact

Regional impact

Conclusions

Opportunity pathways

Annex

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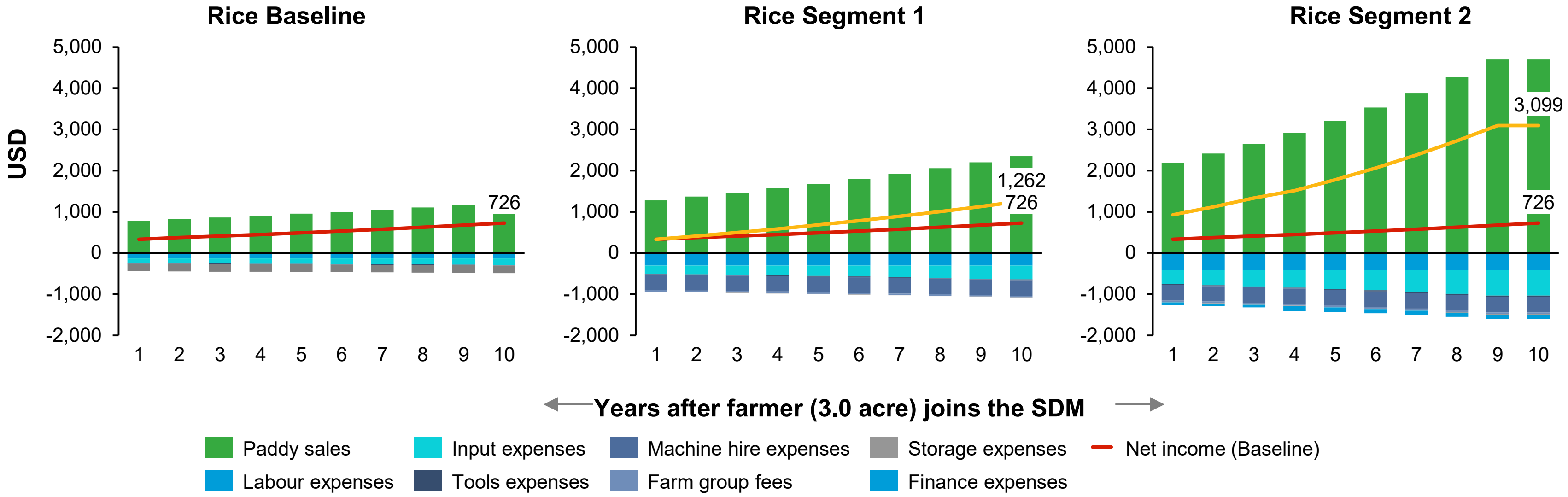
Rice farm P&Ls: overall impact



Economic sustainability at farm level

The above graphs show the P&L for baseline and SDM paddy farmers. The data used for the construction of the P&L was provided by RGL agronomists. In year 5, the baseline paddy farmer has a net income of USD 490 from a 3.0 acre farm. Paddy farmers across the segments have 3.0 acres of paddy cultivation.

SDM segment-2 farmers (having access to bank loan) realize significantly higher yields than SDM segment-1 and baseline farmers. Segment-2 farmers can realize higher yields due to use of quality seeds, intensive application of fertilizers and adoption of GAP. In year 5 of the program, the annual net income reaches USD 1,744 for segment-2 and USD 678 for segment-1 farmer. The net income continue to increase (at a higher rate for segment-2 followed by segment-1 and then baseline farmers) for the next 5 years.

For SDM segment-2 farmers paddy yield is expected to increase by 46% from year 1 to year 5 (2.4MT/acre to 3.5MT/acre) – improvement in irrigation, high yielding variety of seeds, increasing expertise of farmers are key driving factors. The substantial difference in net income between segment-1 and segment-2 farmers indicates the importance of graduating farmers from segment-1 to segment-2.

Main cost drivers

- **Mechanization:** Mechanization is the largest expenses for baseline and segment-1 farmers (approximately 40% of total costs) and 28% of total costs for segment-2 farmers. Mechanizations is used for land preparation (hiring tractor) and hiring of combine harvester for harvesting (baseline farmers do not hire combine harvester)
- **Labor:** Hired labor is the next biggest cost category and accounts for approximately 30% of total costs.
- **Inputs:** Inputs are the 3rd biggest cost category for baseline and segment-1 farmers and largest category for segment-2 farmers because of better quality and more frequent application of fertilizers

Main revenue drivers

- **Production:** In year 5 segment-2 (3.5MT / acre) have significantly higher yields than segment-1 SDM farmers and baseline farmers (1.8MT/acre and 1.2MT / acre, respectively) which is a key driver of higher revenues. Higher yields are due to use of quality seeds, intensive application of fertilizers and adoption of GAP
- **Farm-gate price:** SDM farmers also receive an average farm-gate price of TZS 700/kg of paddy versus TZS 600/kg for baseline farmers.

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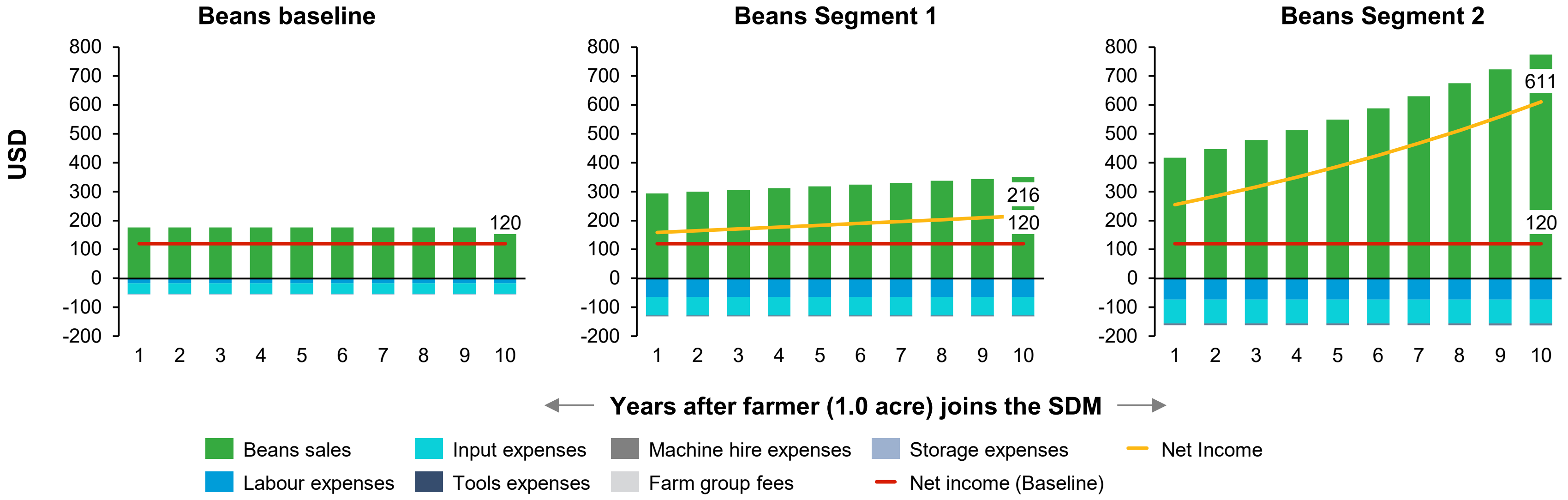
Beans farm P&Ls: overall impact



Economic sustainability at farm level

The above graphs show the P&L for baseline and SDM beans farmers. The data used for the construction of the P&L was provided by RGL agronomists. In year 5, the baseline beans farmer has a net income of USD 120 from a 1.0 acre farm. Beans farmers across the segments have 1.0 acre of beans cultivation.

SDM segment-2 farmers (growing hybrid variety) realize significantly higher yields than SDM segment-1 and baseline farmers. Segment-2 farmers can realize higher yields primarily from use of high yielding hybrid variety of seeds. In year 5 of the program, the annual net income reaches USD 387 for segment-2 and USD 183 for segment-1 farmer. The net income continue to increase (at a higher rate for segment-2 followed by segment-1 and remains constant for baseline farmers) for the next 5 years.

Beans is not the primary revenue generating crop for most of the SDM farmers. The motivation for growing beans (predominantly women farmers) is for supplementary income and own consumption. The yield of baseline farmers remains constant and marginal yield growth of 2% for segment-1 farmers due to beans crop being rain fed limits intensive application of inputs or practices.

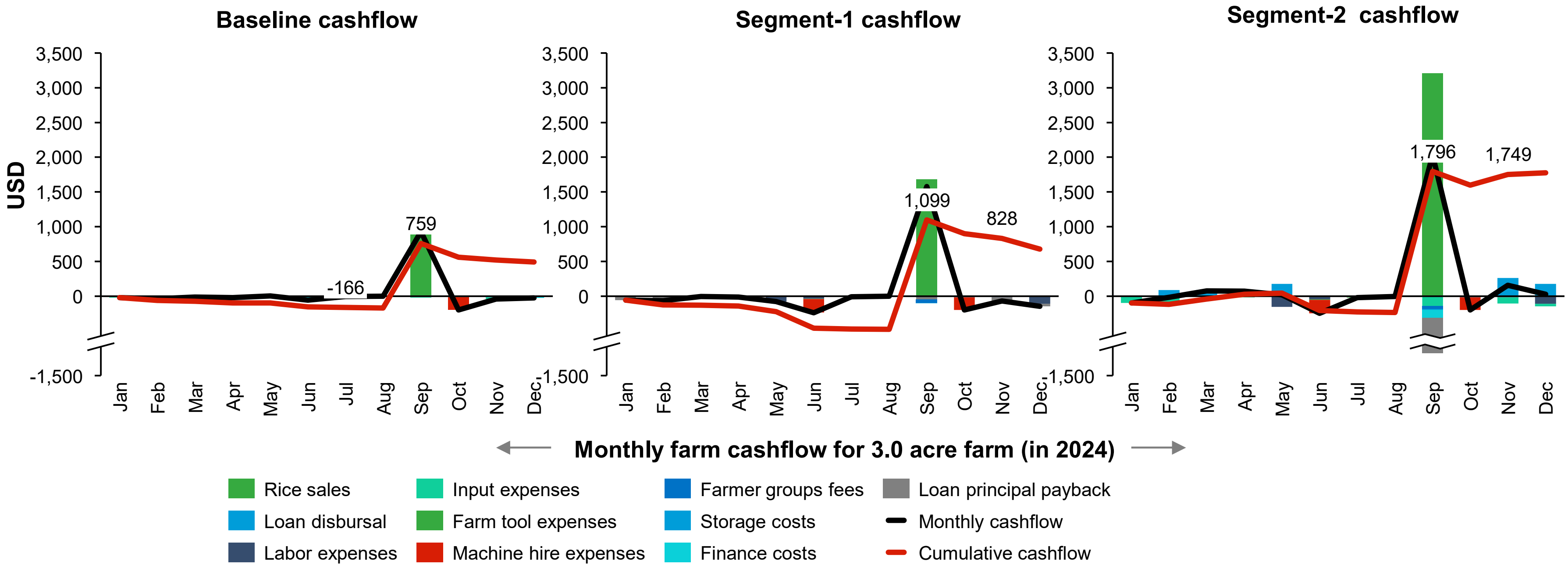
Main cost drivers

- **Inputs:** Inputs (seeds, fertilizers and crop protection) forms the biggest cost category. It can account for up to 50% of total costs and 19% of revenues
- **Labor:** SDM segment-1 and segment-2 farmers hired labor (roughly 75%) constitutes second biggest cost category. Hired labor for seeds sowing, weeding, harvesting and post-harvesting activities cost TZS 5,000 per day and application of pesticides cost TZS 10,000 per day

Main revenue drivers

- **Production:** In year 5, SDM segment-2 farmers growing hybrid variety of beans have average yield 1.0MT/acre while segment-1 farmers growing local variety of beans have average yield of 0.55MT/acre.
- **Farm-gate price:** Local variety of beans fetch a farm-gate price of TZS 1,350/kg vs TZS 1,300/kg for hybrid variety. However, as the preference for consumption of hybrid variety increases, the price of hybrid variety is expected to be higher than local variety by year 8

Rice farm cash flow cycle throughout the year



Discussion

- Baseline farmers have lower labor, machine hire and input purchases as compared to SDM farmers. Highest total monthly expenses accounts for USD 199 in October for land preparation. Paddy harvesting is done in June and stored in village aggregation centers till Aug/Sept for better prices and cash for their produce received in September. As a result of their low expenses their cashflows aren't significantly negative in any month of the year.
- SDM farmers uses higher labor, machine hire and input purchases than baseline (segment-2 farmers use more than segment-1). Segment-1 farmers incur significant expenses during October (USD 199 for land preparation), December (USD 149 for transplantation) and May (USD 239 for harvesting) and during other months as well for weeding, bug chasing and fertilizer application activities.
- Since SDM segment-2 farmers receive all inputs on credit, there is no cash outflow to purchase them. Segment-2 farmers also receive production loans as advance(before harvest) or immediately after an activity is completed(after land preparation), their cash inflows and outflow are closely spaced. The entire loan amount along with interest expense is paid during September from paddy sales proceeds.
- A calendar year has been used to illustrate the cashflow cycle. Since farmers will grow tomatoes every year, we can expect positive cash from the end of one year to carry over to the next.

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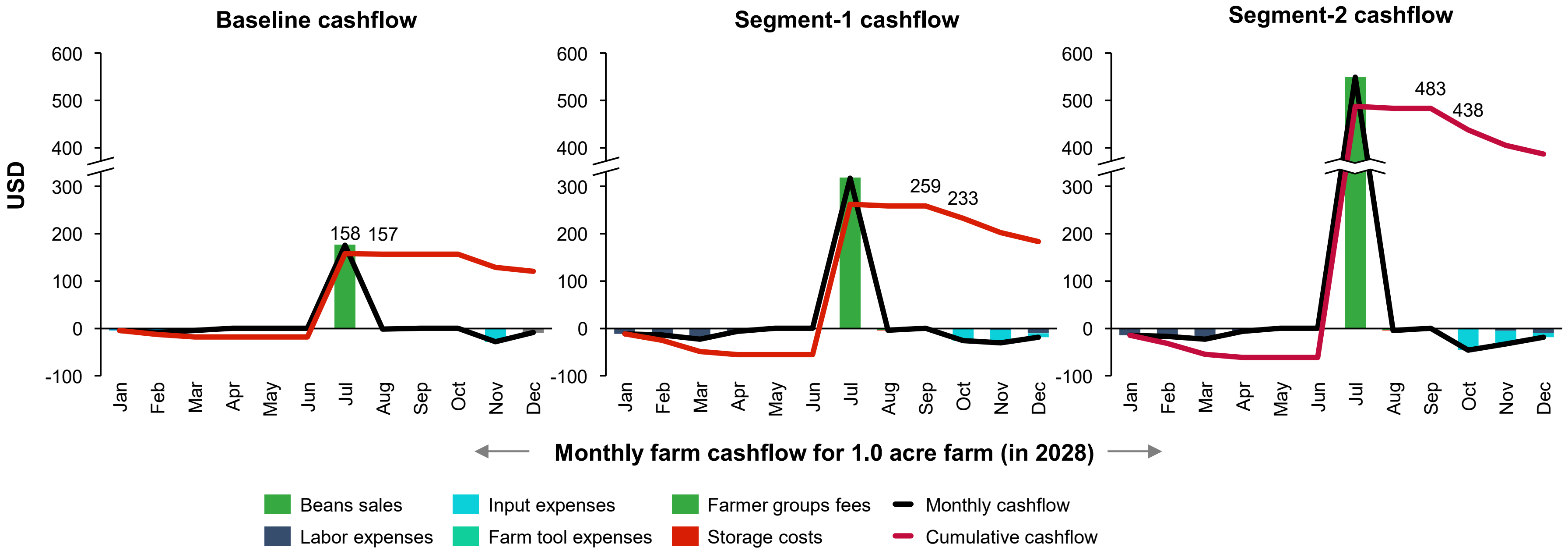
Beans farm cash flow cycle throughout the year



Discussion

- Beans harvesting is done in March and stored in village aggregation centers till May/June for better prices and in July receive cash for their produce. As a result of low expenses (relative to revenues) their cashflows aren't significantly negative in any month of the year.
- Beans a 5-month cycle starting from land preparation in November, sowing of seeds in December to final harvest in March. A short crop duration of 5 months reduces cash flow imbalances that are common with longer duration crops.
- Baseline farmers' highest total monthly expenses accounts for USD 28 in November for purchase of fertilizers.
- Major expense categories for SDM farmers are seeds purchase in October, fertilizer purchase in November and labor expenses for harvesting in March.
- Beans not being primary revenue generating crop for farmers and dependent on rain is not financed by bank loans.
- A calendar year has been used to illustrate the cashflow cycle. Since farmers will grow tomatoes every year, we can expect positive cash from the end of one year to carry over to the next.

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Rice farmer resilience

Rice farmers (segment-1) annual net income (USD/year) for varying product prices, yields and land size, year 5 of SDM

Farm-gate price* (USD/MT) ↓ / Yield (MT/acre/season) →	1.6	1.7	1.8	1.9	2.0
275	352	433	515	597	678
289	423	509	595	681	767
304	497	588	678	769	859
320	572	667	762	857	952
336	650	750	850	950	1,050
352	733	838	942	1,047	1,152

Land size (acre) ↓ / Yield (MT/acre/season) →	1.6	1.7	1.8	1.9	2.0
1.0	161	191	221	251	281
2.0	329	389	450	510	570
3.0	497	588	678	769	859
4.0	665	786	907	1,028	1,149
5.0	834	985	1,136	1,287	1,438
6.0	1,002	1,183	1,364	1,546	1,727

Current projection

Below poverty line**

Rice farmers (segment-2) annual net income (USD/year) for varying product prices, yields and land size, year 5 of SDM

Farm-gate price* (USD/MT) ↓ / Yield (MT/acre/season) →	3.1	3.3	3.5	3.7	3.9
275	1,135	1,298	1,461	1,624	1,788
289	1,270	1,442	1,614	1,785	1,957
304	1,412	1,593	1,774	1,955	2,136
320	1,554	1,744	1,934	2,125	2,315
336	1,703	1,903	2,103	2,303	2,502
352	1,860	2,070	2,280	2,489	2,699

Land size (acre) ↓ / Yield (MT/acre/season) →	3.1	3.3	3.5	3.7	3.9
1.0	137	197	257	317	377
2.0	774	895	1,015	1,136	1,256
3.0	1,412	1,593	1,774	1,955	2,136
4.0	2,049	2,291	2,533	2,774	3,016
5.0	2,687	2,989	3,291	3,593	3,896
6.0	3,324	3,687	4,050	4,413	4,775

* This farm-gate price is a projection assuming that the rest of the value chain will keep the same margins under fluctuating rice market prices.

Discussion

- Tables alongside show the impact that changes in the farm-gate price, farm yields and farm size have on the net income of a segment 1 or segment 2 SDM rice farmer.
- Farm yields have a non-linear sensitivity to farmer incomes. For instance for a segment 1 farmer, if the farm yield drops by about 11% this results in a nearly 27% drop (21% for segment 2) in farmer income (keeping all other factors constant).
- Yearly increases on farm yields for both segments have been built into projections and need to be carefully monitored as any changes can have disproportionate impact on farmer incomes.
- A 5% increase in farm-gate prices results in an over 9% increase in net income for segment 2 farmers (12% for segment 1).
- Small increases in farm-gate prices through quality premiums can have significantly higher impact in terms of farmer incomes.

Beans farmer resilience

Beans farmers (segment-1) annual net income (USD/year) for varying product prices, yields and land size, year 5 of SDM

Farm-gate price* (USD/MT) ↓	Yield (MT/acre/season) →				
	0.4	0.5	0.6	0.7	0.8
530	100	153	205	258	311
558	112	168	223	279	334
587	125	**183**	242	301	359
616	138	199	261	322	384
647	151	216	281	345	410
679	166	234	301	369	437

Land size (acre) ↓	Yield (MT/acre/season) →				
	0.4	0.5	0.6	0.7	0.8
0.5	(5)	25	54	83	112
1.0	125	**183**	242	301	359
1.5	254	342	430	518	606
2.0	384	501	618	736	853
2.5	513	660	807	953	1,100
3.0	643	819	995	1,171	1,347

Current projection

Beans farmers (segment-2) annual net income (USD/year) for varying product prices, yields and land size, year 5 of SDM

Farm-gate price* (USD/MT) ↓	Yield (MT/acre/season) →				
	0.8	1.0	1.2	1.4	1.6
510	231	333	435	536	638
537	252	359	466	573	680
565	274	**387**	499	612	724
593	296	414	532	651	769
623	319	443	567	691	816
654	343	473	604	734	864

Land size (acre) ↓	Yield (MT/acre/season) →				
	0.8	1.0	1.2	1.4	1.6
0.5	56	112	168	224	280
1.0	274	**387**	499	612	724
1.5	492	661	830	999	1,169
2.0	710	936	1,161	1,387	1,613
2.5	928	1,210	1,492	1,775	2,057
3.0	1,146	1,485	1,824	2,162	2,501

* This farm-gate price is a projection assuming that the rest of the value chain will keep the same margins under fluctuating beans market prices.

Discussion

- Tables alongside show the impact that changes in the farm-gate price, farm yields and farm size have on the net income of a segment 1 or segment 2 SDM beans farmer.
- Beans farmer incomes are less sensitive to yields than rice farmers but still have a sensitivity ratio greater than 1.
- if the farm yield drops by 20% it results in a 31% drop in farmer income (29% for segment 2), keeping all other factors constant.
- Yearly increases on farm yields for both segments have been built into projections and need to be carefully monitored as any changes can have disproportionate impact on farmer incomes.
- Beans farmer incomes are also less sensitive to farm-gate prices than rice farmers. A 4.7% increase in farm-gate prices for a segment 2 beans farmers results in a 6.9% increase in net income.
- Increases in farm-gate prices does positively impact beans farmers but to a lesser degree than that of rice farmers.

Financial analysis overall SDM

This chapter presents the findings of the financial analysis of the SDM and the agri-business

In this section you will:

- ✓ Understand the financial performance of the SDM
- ✓ Get an overview of the business impacts of the SDM
- ✓ Find an overview of the resilience of the business to different market conditions

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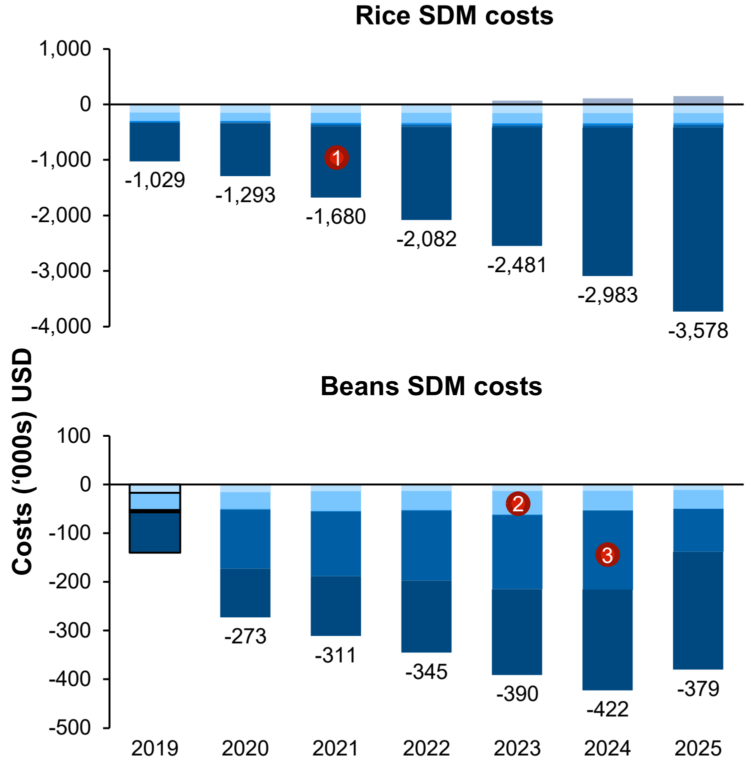
SDM P&L: service costs and revenues


Rice SDM costs

Beans SDM costs

Discussion

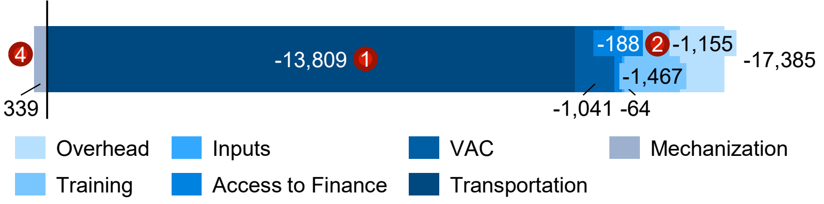
① Transportation accounts for the highest annual SDM costs for rice in all the years and in most years for beans. As a results, it is also the service that the SDM operator will need to make the most cumulative investments (USD 13.8 M) between 2019 and 2026.

② Training is the second largest cumulative costs (USD 1.47 M) between 2019 and 2026. Annually an average of USD 200,000 is spent on training due to yearly addition of new farmers to SDM project

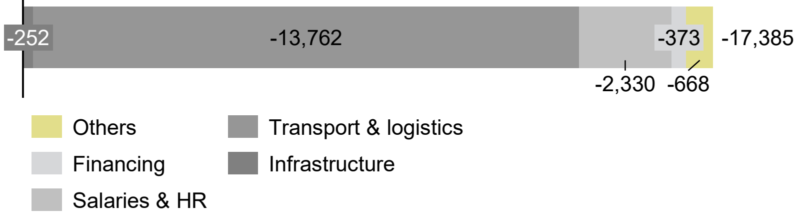
③ Overheads, which consists of HQ staff salaries & other administration costs cumulatively account for USD 1.15 M between 2019 and 2026 while construction and maintenance of village aggregation centers cumulatively costs USD 1.04 M during the same period. Most of the VACs are built for beans in 2020 (construction costs amortized for 5 years) and hence the costs decline from year 2025

④ Mechanization starting in 2023 is the only revenue generating service and can be profitable from the start. It accounts for USD 339,000 of net income between 2023 to 2026

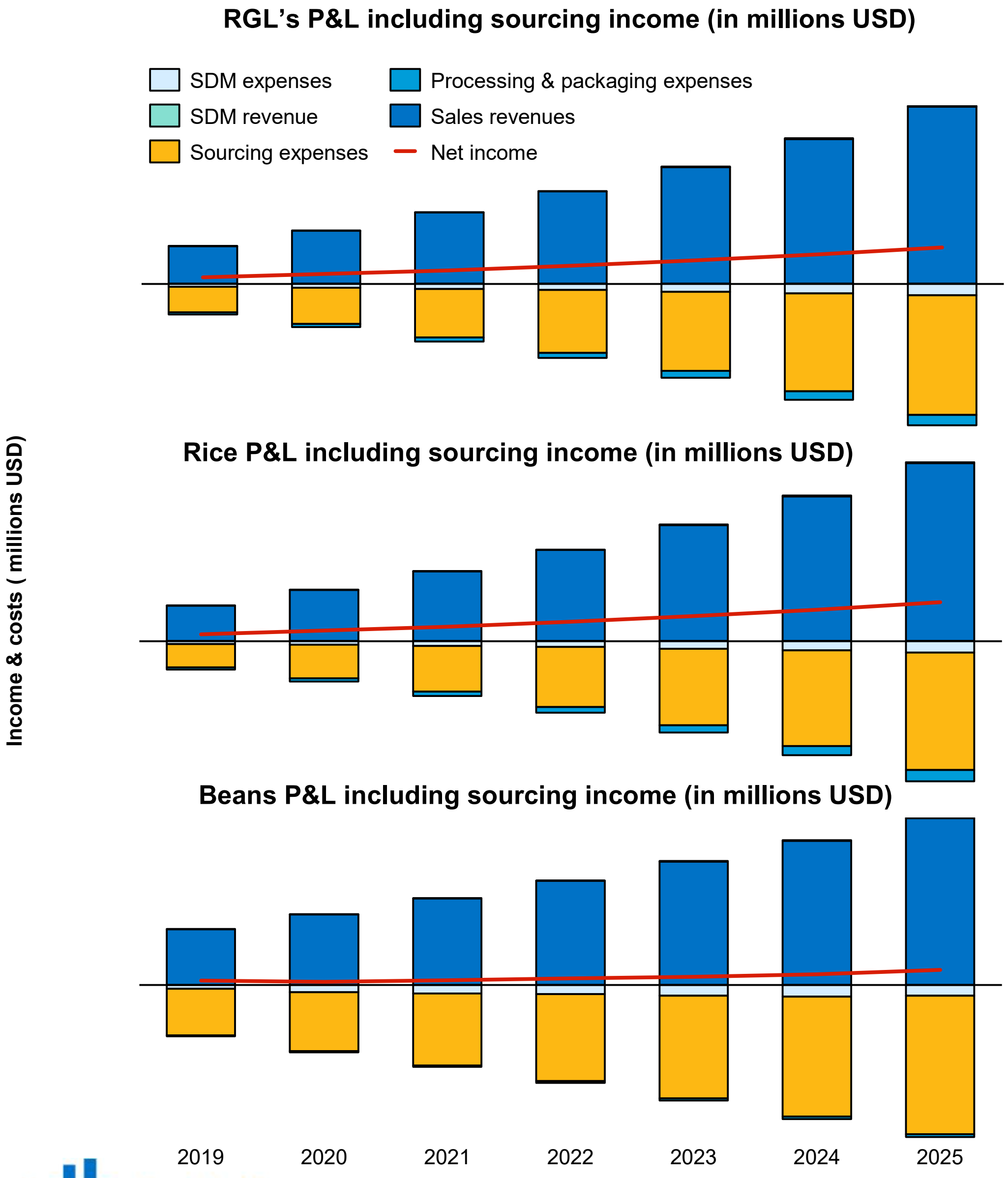
Cumulative SDM costs ('000s USD) from 2019 to 2025



Cumulative SDM costs ('000s USD) by cost type from 2020 to 2026



Business P&L: costs and revenues



RGL's P&L including sourcing income (in millions USD)

Rice P&L including sourcing income (in millions USD)

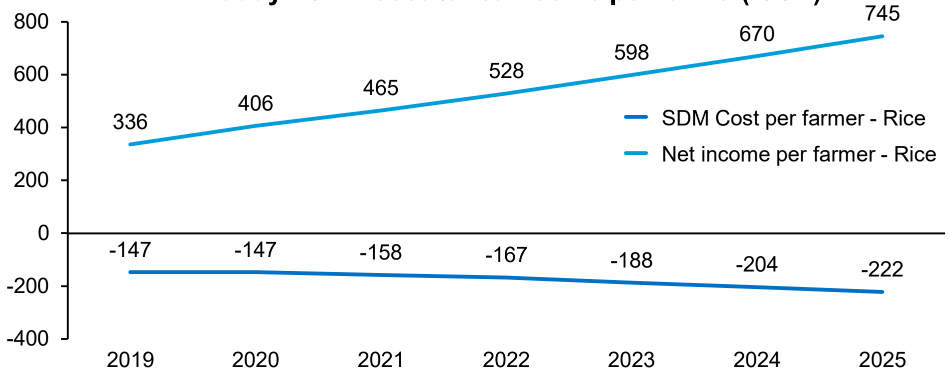
Beans P&L including sourcing income (in millions USD)

Discussion

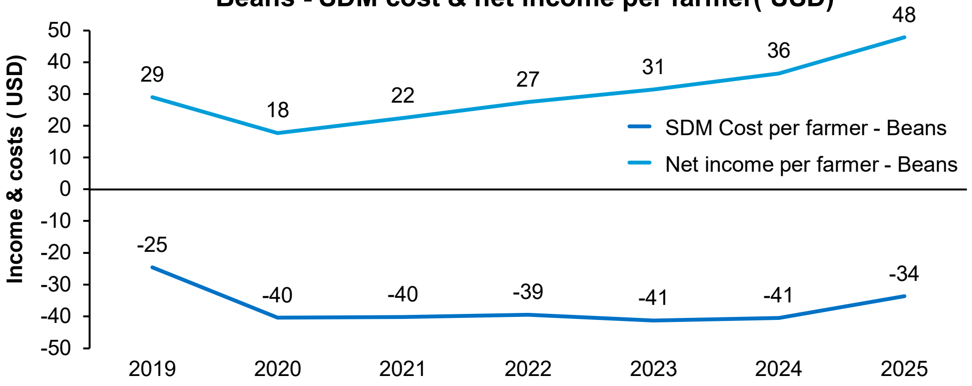
- The SDM on its own operates as a cost center since it incurs costs for delivering services but does not receive any direct service revenues for most of the services (except for mechanization).
- The business case for the SDM arises from increased volume of rice and beans sourcing which results in higher revenues and net income to RGL. Hence the costs of sourcing, processing and revenues from sales of processed goods need to be considered.
- Total SDM net income increases at a CAGR of 33% from 2019 to 2025 due to three factors
  - Increase in scale of SDM (17% CAGR of paddy farmers)
  - 12% CAGR in paddy sourced from each farmer – contributed by both higher proportion of segment-2 farmers and increase in yield per acre
  - Decrease in net SDM expenses
- The rice SDM delivers significantly higher returns to RGL than beans. Net income margin in 2025 for rice is 21.8% versus 9.1% for beans. This implies that the structure of the beans SDM needs to be looked at and evaluated for efficiency.
- Rice net income margin improves from 19.2% in 2019 to 21.8% in 2025 entirely from reduction in SDM expenses and addition of mechanization service revenue from 2023.
- SDM expenses account for 8.2% of sales revenue in 2019 and declines to 6.5% by 2025 due to
  - Higher yields (mainly paddy) resulting in increased value of sourcing from farmers
  - Reduction in SDM costs for VAC (front loading of capex) in outer years of the SDM.

SDM cost and income per farmer

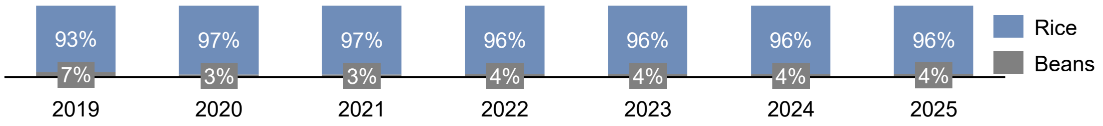
Paddy - SDM cost & net income per farmer(USD)



Beans - SDM cost & net income per farmer(USD)



Rice and Beans contribution to net income



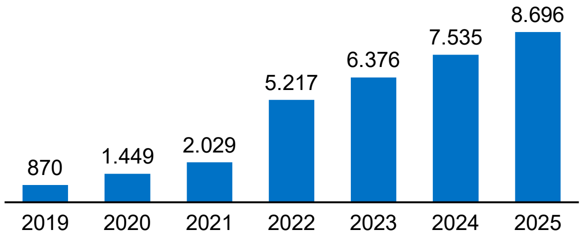
Discussion

- Transportation accounts for nearly 80% of SDM costs, hence a larger proportion of SDM costs are incurred on mature SDM farmer having higher yield and loyalty rate.
- The crop type plays a big role in the costs per farmers. Paddy farmers require more transport (larger farms, higher yields and loyalty), higher levels of training, access to finance and support from RGL than beans farmers, resulting in higher average costs per farmer.
- Average cost per paddy farmer in 2025 of USD 222 is much higher than USD 34 for beans farmer primarily due to larger quantity of produce sold to RGL, incurring more transport cost(7.4 MT of paddy vs 0.8 MT of beans).
- Average cost per beans farmer increases from USD 25 in 2019 to USD 40 in 2020 because of construction of VAC's in 2020. Once most of the capex for VAC's is amortized by 2024, the cost in 2025 reduces to USD 34 per farmer.
- Net income per paddy farmer increases to USD 745 in 2025 from USD 336 in 2019 (14% CAGR) driven by 12% CAGR in paddy sourced from each farmer – contributed by both higher proportion of segment-2 farmers (56% segment-2 farmers in 2025 from 29% in 2019) and increase in yield per acre (7 to10% CAGR).
- Net income per beans farmer increases to USD 48 in 2025 from USD 29 in 2019 (9% CAGR) driven by 7% CAGR in paddy sourced from each farmer.

Barriers to scaling the SDM

Farmer financing

Total loan capital for farmer financing (‘000s USD)



Discussion

- Financing of segment 2 rice farmers is critical to RGL’s business growth as it has a direct impact on the volume of rice available to be sourced.
- Current projections estimate that by 2025 over USD 8.5M of loans will need to be provided to segment 2 rice farmers.
- Ensuring availability of sufficient capital for these loans will be a key consideration in scalability of the model

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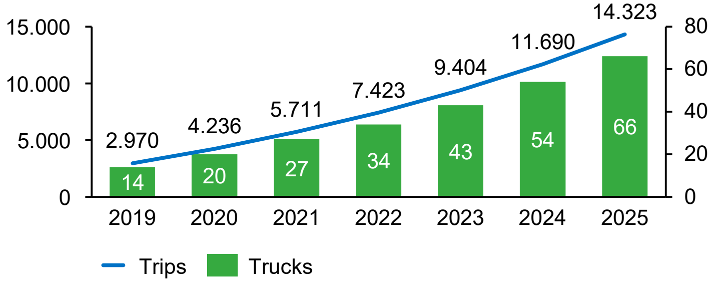
Transportation

Number of trips per year and number of 10MT trucks needed



Discussion

- Increase number and productivity of farms implies increasing volumes (especially of rice) to be transported.
- In 2025 over 14,000 trips need to be completed, which will require about 66 10MT trucks to do so.
- Ensuring that there is availability of enough transport capacity, either through hired or own trucks, is a scaling factor to closely monitor

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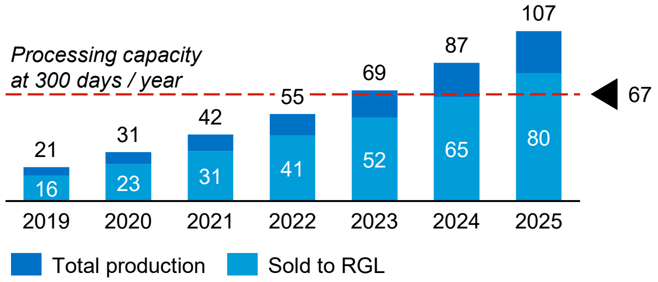
Rice processing capacity

Rice produces vs RGL processing capacity (‘000s MT)



Discussion

- RGL currently has 2 rice processing mills with one more expected in Morogoro. This will provide a net capacity of 67,000 MT of rice per year.
- Total RGL rice production is projected to reach 65,000MT by 2024. Further expansion beyond that will require investment in a 4th rice processing mill

Value creation and regional impact

This chapter presents the findings on impact the SDM has in the regions in which it is active
In this section you will:

- ✓ Understand the overall economic value created
- ✓ Get a view of its contribution to job creation and regional trade

Overview of SDM stakeholders & objectives

Services, scale and organization of the SDM

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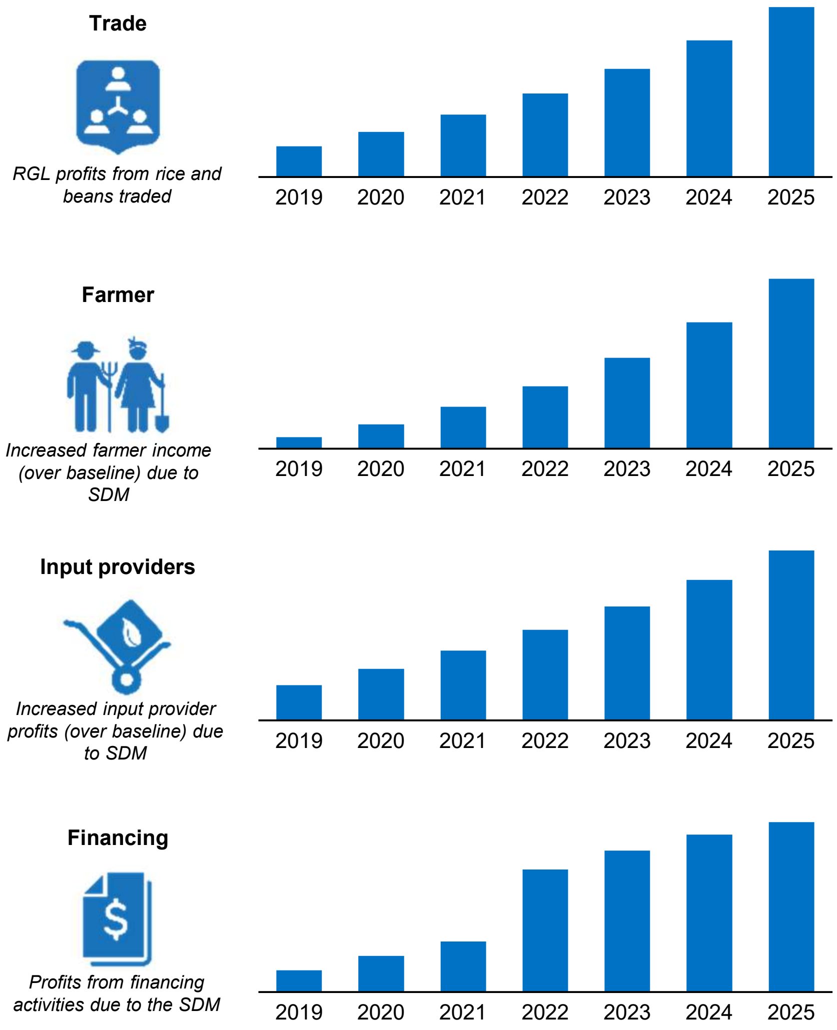
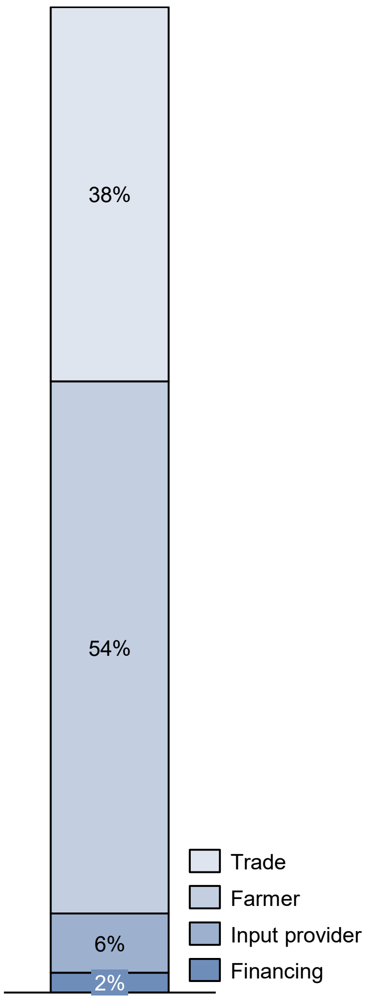
Value creation in the SDM region

Annual value created for key actors in the SDM



All figures in millions of USD

Cumulative value created between 2019 and 2025 (% distribution)

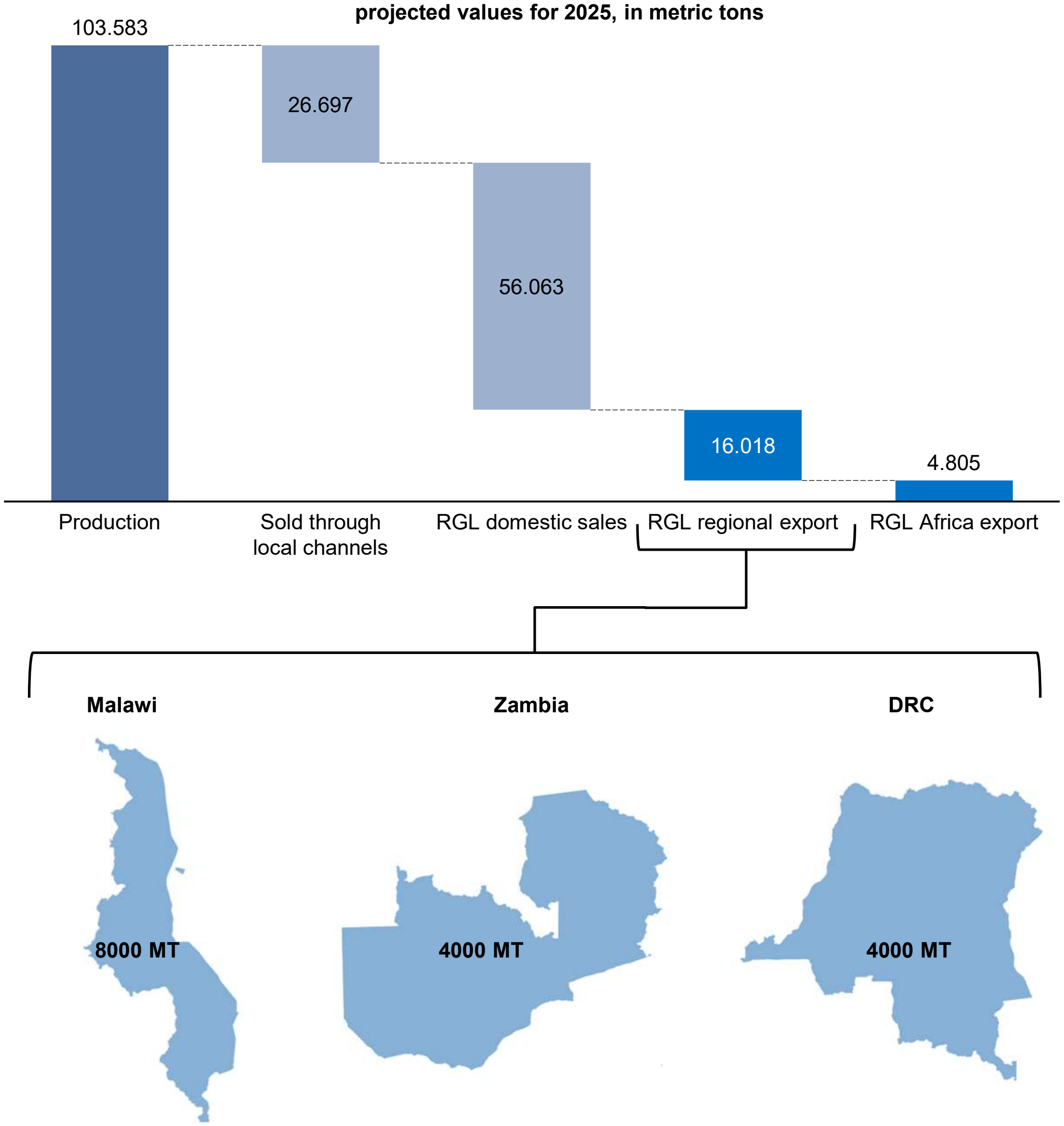


Discussion

- Annual value creation by the SDM is projected to increase nearly 9-fold from USD *(figure hidden)* in 2019 to USD *(figure hidden)* by 2025. The SDM is projected to cumulatively generate about USD *(figure hidden)* of value over this period.
- Farmers stand to gain the most with about 54% of the value accruing to them. This is primarily in the form of improved net income as a result of participating in the SDM.
- RGL also stands to benefit significantly with about 38% of value accruing to them. This comes in the form of increased business revenues and profits from sourcing, processing and selling rice and beans.
- Other key actors such as input providers, financial service providers, mechanization providers and local labor also stand to gain from the SDM – though to a smaller extent than the farmers and RGL.
- Farmers in the SDM buy higher quantities of seeds and fertilizers than baseline farmers which results in about USD *(figure hidden)* in cumulative profits for input providers between 2019 and 2025.

SDM contribution to Regional trade and food security (rice)

Sales / export of rice produced through the SDM – based on projected values for 2025, in metric tons



Discussion

- The SDM is projected include 18,000 rice farmers by 2025 resulting in production of over 100,000 MT rice in the region annually.
- About 75% (or about 77,000MT) of this is expected to be processed and sold by RGL. The remaining 25% (about 26,000 MT) is either retained by the farmers for their own consumption or sold in the local market through other channels.
- Based on historic patterns, RGL will sell about 56,000 MT of rice within Tanzania by 2025. This is roughly about 1.5% of the total rice consumption in the country. Tanzania currently faces a shortfall of rice and the SDM can play a key role in filling that gap.
- Based on trends in 2017 – 2019, RGL exports about between 15% and 20% of its annual rice production to neighboring countries. Malawi, Zambia and DRC and the main recipients of rice imports from RGL.
- Extrapolating these patterns indicates that by 2025 RGL will export about 20,000MT of rice outside Tanzania. About 16,000MT of this amount is projected to go to Malawi, Zambia and DRC which all have a short-fall of rice.

Conclusions

This chapter presents the findings and conclusions of the overall analysis, reflecting on the objectives described at the beginning of the analysis.

In this section you will:

- ✓ Get insights of the overall SDM performance in relation to the initial objectives
- ✓ Find the key drivers for success identified and the lessons learned

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Conclusions: key drivers for success and key risks

Key drivers of success

- **Scale up rice farmers and farmer groups that can access financing.** Rice accounts for most of RGL's business profits. Most of the projected growth between 2019 and 2025 comes through increase in rice production and sourcing from segment 2 rice farmers. However, these farmers will not be able to achieve the projected farm yields without accessing input and production loans. Hence initiatives at the farmer, farmer group and RGL level that facilitate access to finance are critical to the SDM.
- **Control quality of rice and beans seed varieties.** Increasing yields for rice farmers are build into the projections. Good quality rice seeds are essential to ensure these yields are realized. Beans farmers using Hybrid seeds also see higher yields which are needed to meet the projected growth figures.
- **Invest in farmer group relationships.** Farmer groups play a key role in delivery of many of the SDM services to farmers. The need for financing, seeds and inputs are aggregated and delivered at a group level. Hence ensuring that the groups are well managed and legally registered is a key driver of successes.

Key risks

- **Farmer incomes and RGL profits have high sensitivity to yields.** A small decrease in yields results in a much larger drop in farmer incomes. Increasing rice yields have also been built in to RGLs P&L projections. Not achieving the rice yield increase has implications for both farmers and RGL and hence need to be carefully monitored.
- **Transporting rice and beans to the warehouse is a big cost element.** Hired transportation is the biggest cost to the SDM and accounts for about 8 – 10% of the cost of sourcing rice and beans. Even small increases in the cost of fuel or other factors impacting transportation costs can eat into RGLs profit margins. Hence optimizing transportation using local collection centers and RGLs own fleet of 10MT trucks can help mitigate some of these risks.

High value opportunity pathways

This chapter presents opportunities to create increased efficiency, scale and impact in the future

In this section you will:

- ✓ A summary of the key opportunity pathways to be explored
- ✓ Analysis of the potential and / or business case for the key opportunities

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High value opportunities for further exploration

	What is the opportunity?	Why is it important?
1 **Mechanization services**	RGL invests in tractors and / or combine harvesters. Rice farmers can hire mechanization services from RGL for land preparation and harvesting.	As yields of rice farmers grow there will be increasing demand for mechanization. Current capacity in the regional market may not be able to keep up.
2 **RGL's own fleet of trucks**	RGL owns and maintains a fleet of 10 MT trucks to transport rice and beans from the VAC to its warehouse / processing centers.	Transportation is by far the biggest cost to the SDM and can be optimized using own trucks. The business case becomes even stronger as the production volumes grow.
3 **Farmer group financing**	Hire a consultant to get rice farmer groups officially registered and ensure that they have all the paperwork needed to be approved for loans from the bank.	Most of the projected income increase for farmers as well as the volume increase for RGL is contingent on segment 2 rice farmers receiving loans (through farmer groups).
4 **Digital platforms**	Use a digital platform to manage interactions with groups and farmers. This would include gathering inputs and seed requirements, managing transport and mobile payments.	Increasing scale of operations will make it harder to effectively manage operations. Many digital platforms exist that can be used to make service provision simpler.

①

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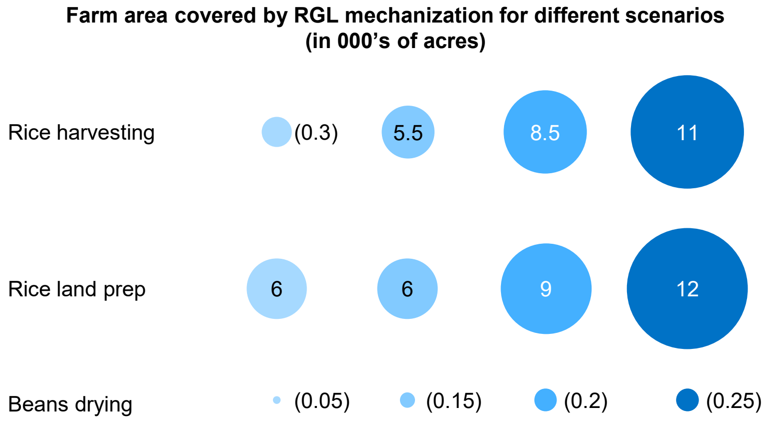
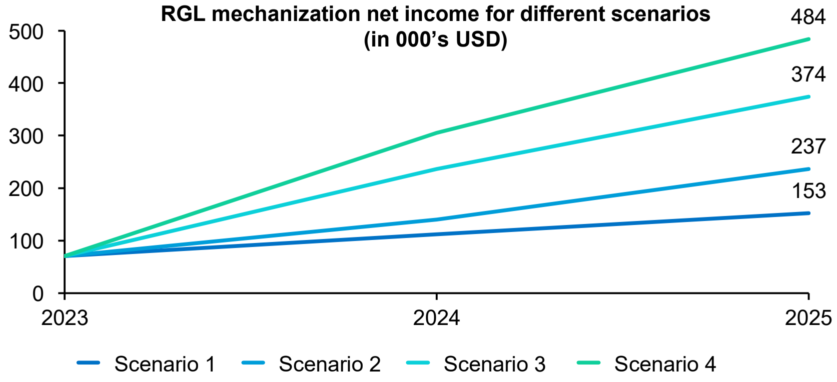
Business case for investing in mechanization services



Farm area covered by RGL mechanization for different scenarios (in 000's of acres)

Equipment	Scenario 1 (Current)	Scenario 2 (10%)	Scenario 3 (15%)	Scenario 4 (20%)
Combine harvesters	4	7	11	14
Tractors + tiller & rotavator	4	4	6	8
Mobile dryers	1	3	4	5



RGL mechanization net income for different scenarios (in 000's USD)

Discussion

- There is a strong business case for RGL to provide mechanization services to rice and beans farmers. There is currently more demand for mechanization than can be serviced by providers in the local market. This gap is expected to progressively increase as the number of farmers participating in the SDM goes up over the years.
- Different scenarios have been evaluated. Scenario 1 covers the currently projected number of combine harvesters, tractors and beans dryers. Scenarios 2, 3, and 4 estimate the amount of equipment needed to cover 10%, 15% and 20% respectively of the projected rice and beans farm area under the SDM by 2025.
- The net margin per mechanization equipment after accounting for depreciation, operating costs and labor costs is strongly positive. Hence, the mechanization income for RGL increases proportionally with the number of machines procured.
- Given the strong margins for mechanization, there is an opportunity for RGL to offer it at below market price as an incentive for farmers to participate in the SDM and increase adoption and loyalty rates.

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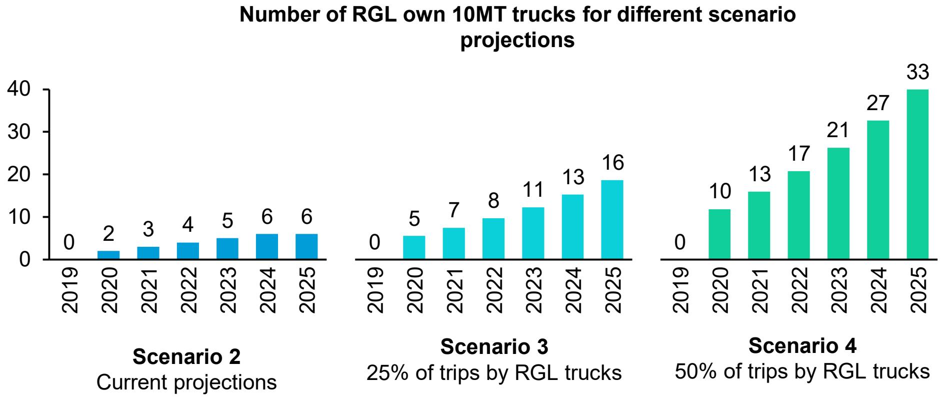
Business case for investing in RGL's own fleet of trucks



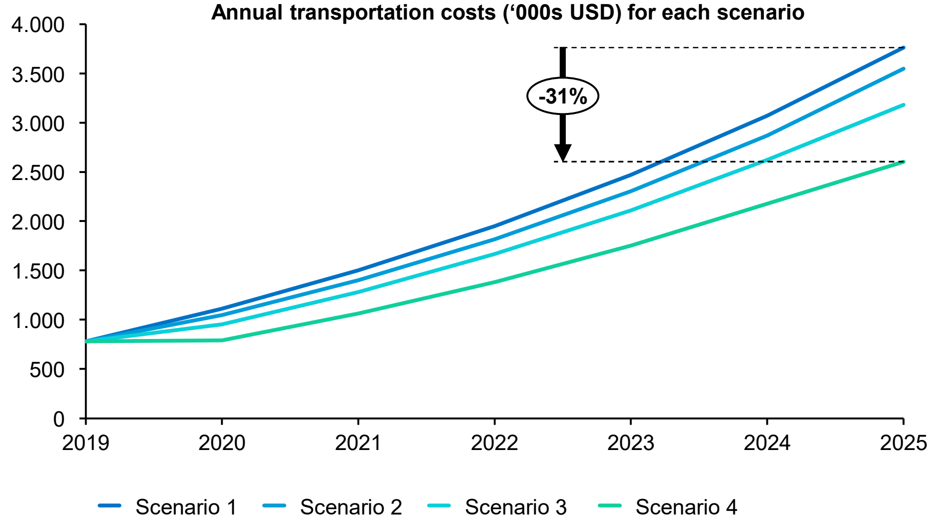
Number of RGL own 10MT trucks for different scenario projections

Scenario 2
Current projections

Scenario 3
25% of trips by RGL trucks

Scenario 4
50% of trips by RGL trucks

Scenario 1 – No RGL owned trucks



Annual transportation costs ('000s USD) for each scenario

Discussion

- Transportation accounts for nearly 80% of the total SDM costs. Investments that optimize this cost offer a significant opportunity to increase RGL's net income from rice and beans.
- One way to optimize costs in the long run is for RGL to procure and manage its own fleet of 10MT trucks. Multiple scenarios for this have been considered and compared to scenario 1 – no RGL owned trucks.
- Scenario 2 is the current projections provided by RGL on the number of trucks they intend to buy. Scenarios 3 and 4 look at the number of trucks needed to transport 25% and 50% of all beans and rice sources by 2025.
- Any scenario that involves purchase of trucks results in a cost reduction from the current model of all rented trucks. The more trucks that are purchased, the bigger the savings.
- If RGL purchases enough trucks to transport 50% of all volumes, it stands to reduce transportation costs by over USD 2.6M (31%) in 2025.
- Cumulatively between 2019 and 2025, scenario 2, 3 and 4 will result in transportation costs savings of USD 2M, 4.6M and 9.4M over scenario 1 (no own trucks).

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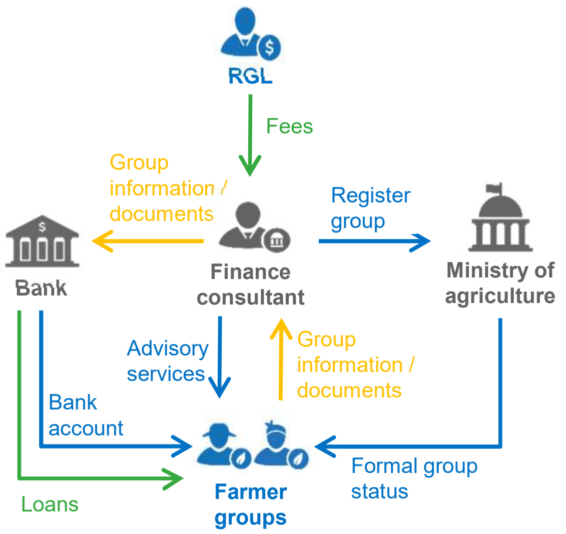
Business case and approach for investing in registering farmer groups

Financial consultant services to register and make rice farmer groups “bankable”



RGL
Fees
Group information / documents
Bank
Finance consultant
Register group
Ministry of agriculture
Advisory services
Group information / documents
Bank account
Loans
Farmer groups
Formal group status

Projected cumulative outcome from making groups bankable

120,000 — USD invested between 2020 and 2025 for a finance consultant

50 — Total number of bankable farmer groups by 2025

8.7 — M USD of loans provided annually to rice farmers from 2025 onwards

Discussion

- A small investment in helping farmer groups be bankable and eligible for loans can results in a significant multiplier effect in terms of value creation for all stakeholders in the SDM.
- It is estimated that an investment of USD 120,000 between 2020 and 2025 can result in about 50 farmer groups becoming bankable, resulting in loans of USD 8.7 being given to farmers in 2025.
- This investment is best directed towards a financial consultant who can liaison between farmer groups, banks and the relevant government agencies.
- Responsibilities of the consultant would include the following.
  - Advising and helping farmer groups to collect the right paperwork needed to get registered as a co-operative and to be eligible for loans from the bank.
  - Submitting the application on behalf of the groups to the ministry of agriculture and liaising with them to process the application.
  - Once approved, to work with banks to pre-approve the farmer group for loans so that funds can be disbursed with minimal processing during the planting season.

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Opportunities to leveraging digital platforms

Discussion

- Leveraging digital platforms can generate value to both RGL and farmers / farmer groups.
- Value accrues in the form of efficiency gains, reduced transaction costs and improved direct access to services for farmers and co-operatives.
- Investments in a digital platform should be made considering the total cost of ownership over a period, which includes setup costs, transaction costs, annual fees / license costs and any administrative and management overheads.

Functional Area	Possible use-cases	Value to RGL	Value to farmers / groups
Loan processing and management	• Electronic loan application by farmer groups • Sending of digital documents from RGL (purchase contracts, etc) for loan approval • Electronic / SMS based communications on loan status • Direct disbursement of funds to input providers • Direct disbursement to groups / farmers for production loans	Medium	High
Payments	Digital / mobile payments for • Loan disbursement and repayments • Payments to farmers for produce • Payments by farmers for services and inputs	High	High
Planning, forecasting and Logistics	• Forecasting seed and input requirements for at farmer / group level • Coordinating delivery of inputs to farmer / group • Managing and tracking collections at VACs • Coordinating collection and transportation from VACs	High	Medium
Coordination of services	• Marketplace for connecting service providers and farmers • Aggregating demand for services such as mechanization • Planning and managing RGLs mechanization services	Medium	High

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Annex

This chapter presents additional information that were used to carry out the analysis.

In this section you will:

- ✓ Get a general introduction to Service Delivery Models
- ✓ Get insights on other analysis (e.g. environmental lens, gender lens)
- ✓ List of KPIs used
- ✓ Glossary

Overview of SDM stakeholders & objectives
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Annex I: SDM General Introduction & context

This section of the annex is standard for all cases and provides an introduction to the topic and the approach of this study.

In this section you will:

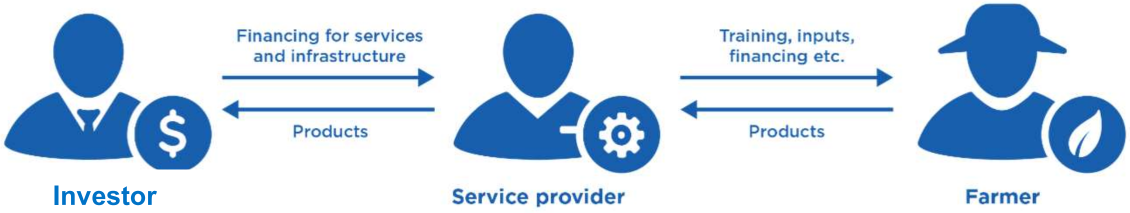
- ✓ Understand what SDM means
- ✓ Get a snapshot of the stakeholders and forces that shape an SDM
- ✓ Get an overview of our approach

Service Delivery Models (SDMs)

SDMs are supply chain structures, which provide services such as training, access to inputs and finance to **farmers**, to improve their performance, and ultimately their profitability and livelihoods.

Service providers offer the services; they can be a trader, processor, farmer organization, NGO, public extension scheme, etc.

Investors tend to be (final) buyers of the product, looking to secure their supply and / or for reputational reasons are interested to invest in the farmer.


Financing for services and infrastructure
Products
Training, inputs, financing etc.
Products
Investor
Service provider
Farmer

Processors, traders and other value chain players in agri-commodities are beginning to see service delivery as part of their business, rather than something the buyer requested or only as a way to create farmer loyalty.

This results in value chain players establishing a relationship with the farmer as a client, being interested to gain a better understanding of the structure of their existing SDMs, what services are being delivered, to which farmers, and the impact on their business.

Companies are also gaining a clearer understanding of how to fund such services and are exploring ways to make their model less dependent on external funding, i.e commercially viable.

Service delivery models and the stakeholders that shape them are evolving

Processors, traders and other value chain partners - see service delivery as part of their core business

Financial institutions, development banks and social investors – show an increased risk-taking appetite

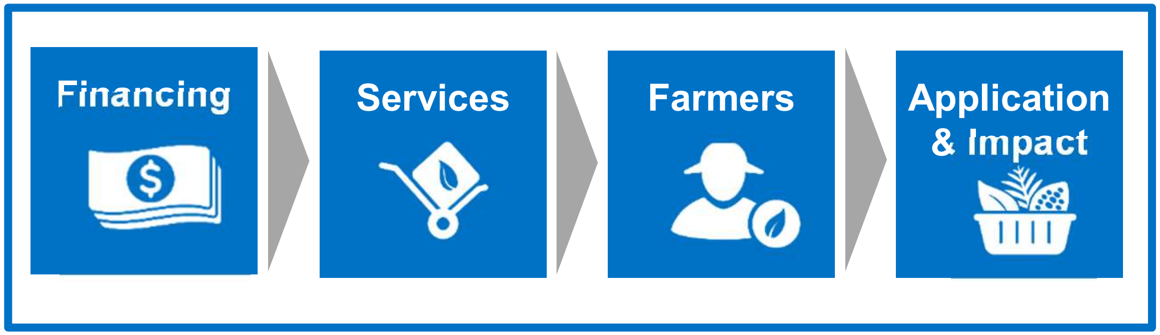
Donors - focus on how to create the largest leverage and return on investment

Innovative businesses emerge that develop solutions for optimizing service supply

Levels of SDM Analysis

SDM Structure

The analysis looks at the SDM from a holistic perspective, identifying the way the model is structured



Financing

Services

Farmers

Application & Impact

Within this structure (financial) resources are invested

Those resources allow for a set of services to be delivered

These services are targeted at a (type of) farmer

The aim of these services is an impact at farm level

This impact translates into financial benefits so the structure (over time) becomes financially sustainable

This analysis in this case study is organized in the following way:

1. What is the **structure** of the SDM
2. What are the **services** provided
3. What is the impact of those services at **farm** level
4. What is the business case for the individual **entities** delivering the services
5. What is the **financial** impact of the SDM as a whole
6. What **conclusions** can we draw from our analysis

Purpose of the SDM Analysis

An outcome of SDM analyses to date was the identification of those issues which the SDM operators found of critical importance, and where they encountered limited knowledge to be available. Examples are:

Focus learning questions

- How to improve adoption and loyalty rates
- How to use farmer profiles to tailor make service packages
- How to drive down costs (for farmers and service operators)
- How to finance a SDM (types of finance, types of farmers) and timelines
- How to create a positive enabling environment for a service delivery model

IDH will stimulate dialogue with key partners on these topics, by targeting these questions in a broader range of SDMs and by facilitating webinars and knowledge sharing events.

IDH aims to create:

Action driven analysis

- Analyzing a broader range of SDMs with partners that are keen to improve their SDM
- Establishment of an Innovation Program & Fund to co-design and co-fund innovative solutions within SDMs
- Develop insights packaged for financial institutions, which facilitate partnerships with service providers

A learning community

- Deeper analyses on key levers for optimizing performance of SDMs; e.g. farmer segmentation and adoption
- Convening key partners on pre-competitive topics in SDMs through learning events, webinars and knowledge sharing
- Forming strategic partnerships with knowledge partners that share the interest in driving performance of SDMs

With the SDM analysis, IDH envisions to identify and create actionable improvement opportunities

Individual SDM analysis:

Analyze SDM

Identify key success drivers

Identify enabling environment challenges

Identify opportunities for innovation

Evaluate funding needs

To facilitate further learning and improvement, IDH aims to establish:

Global knowledge hub

- Deeper analyses on key levers for optimizing performance of SDMs; farmer segmentation and adoption
- Benchmarking data and best practice for designing and implementing smallholder business models
- Organize learning community

Enabling environment

- Convening key partners (at sector and national level) on pre-competitive topics in SDMs
- Forming strategic partnerships with knowledge partners that share the interest in driving performance of SDMs

Blended finance

- Establishment of an Innovation Program & Fund to co-design and co-fund innovative solutions within SDMs
- Develop insights packaged for financial institutions, which facilitate partnerships with service providers

Technical assistance

- Innovating and improving smallholder business models of private sector players
- Using private sector lessons to inspire public sector players and vice versa

Annex II: Context

This section of the annex is standard provides a description of the context of the SDM

In this section you will:

- ✓ Get insights on the development of the commodity sector and characteristics of the farmers in the region under study
- ✓ Understand the enabling environment in the region
- ✓ Get insights on the status of gender equity
- ✓ Get insights on the status of environmental resilience of farmers

Farmer context

The number reflects the negative impact of the challenge on SDM farmers

0: very limited impact

5: high impact

Farmer context	Challenges	Impact	Measures taken by SDM operator
Agronomic	• Many farmers have to rely on home-grown seed (from previous harvests), resulting in low yields and slow growing crops. • Fertilizer application levels are low at 9kg/ha. This compares against recommended application levels in excess of 100kg/ha. • Average yields of beans 0.6 MT/ha compare poorly against an estimated attainable yield of 1.5-3 MT/ha. • Most farmers combine different varieties on the same plot leading to dominance of mixed beans on the market and lower prices[3]. • Most farmers (95%) process their own seeds (indigenous varieties) from the previous year's harvest while a few (5%) use improved rice varieties.	▼ 4	• Provision of high-quality seeds, that are resilient to the harsh climatic conditions • RGL trains farmers on good agricultural practices • RGL provides high quality agrochemicals (fertilizers and pesticides) to help achieve higher yields and prevent and control pests and diseases.
Economic	• Farmers lack financial and entrepreneurial skills. Although, on average, they own around 4-6 acres of land, they only cultivate 1-2 acres because of limited cash liquidity and entrepreneurial mind-set. • Market prices fluctuate from year-to-year and are often at the lowest at the end of the harvesting season • Farmers typically have low cash flow at key points in the year, leaving them unable to cover key expenses. • In the majority of the cases, farmers sell their products to middlemen. This results in small bargaining power over the selling price of their products.	▼ 3	• RGL provides training to farmers on financial management hence helping them manage their finances better. • RGL provides farmers with contracts. This allows farmers to be more secure about their selling.
Social & Environmental	• Education levels of farmers are low, while the reach of extension services is also limited resulting in many farmers relying on traditional agricultural techniques • Both men and women work in the value chain but women undertake the majority of field labor • Increasing unpredictability of weather patterns disincentivizes farmers to invest in farming • Poor infrastructure complicates crop transportation from their farms and access to banks/agro-dealers • There is an increasing trend towards farmer organization formation largely driven by the Tanzanian government	▼ 3	• RGL provides farmers with quality pesticides that ensure that the farmers are able to prevent and control pest and diseases . • RGL provides training and encourages best agricultural practices like conservation agriculture, allowing farmers to understand soil health and providing options to change aspects, if needed. • RGL offers transportation to all FOs, helping those in geographically isolated regions have access to an off-take market

Opportunities and challenges in the enabling environment

Impact of environment on SDM

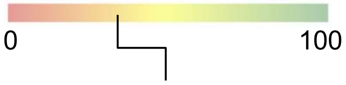
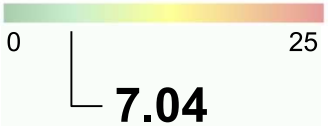
L (Limiting) = The environment hinders the implementation of the SDM

N (Neutral) = The environment does not influence the implementation of the SDM

E (Enabling) = The environment facilitates the implementation of the SDM

	Definition	Opportunities and challenges	Impact	Measures taken by SDM operator
Governance	**LAND OWNERSHIP** Existence of land ownership rights / regulations and their enforcement. Ease of purchasing/ transferring land	In Tanzania land is owned by the State and citizens have the right to use this land. However, there is limited availability and access to land, due to disputes between farmers and pastoralists, lack of awareness on ownership, legal status, and policies. Most of the farms are small-scale	P	
	INFRASTRUCTURE Existence and state of roads, water and electricity networks as well as proximity to main trading / processing hubs (e.g. access to market)	Rural, particularly last-mile, infrastructure is often inadequate translating into high transport costs. Access to electricity is also very limited	P	RGL currently offers transport services and collects the produce from the farmer groups. Farm inputs are also delivered to the groups.
Farm Inputs	**LABOR** Cultural norms that restrict /promote people of certain ages, genders or social groups from farm labor. Availability and cost of labor	On average, 60% of the labor on smallholder farms is hired. However, cheap labor due to the high rural unemployment levels, keep total labor costs down.	N	
	INPUTS & FINANCING Availability of affordable, quality inputs and the necessary marketing and distribution mechanisms. Availability of credit. Enabling regulatory environment	Banks are willing to provide finance to farmer groups with off-take contracts and a track record of meeting contractual requirements. There is limited appetite for direct-to-farmer lending.	E	RGL provides off-take contracts and is part of a consortium of service providers that includes a financial institution to improve access to credit for FOs
Crop	**TRADING SYSTEM** Organization of the system through which crops are traded from farmer to market, including the number and type of actors involved	Value chain is disaggregated and disorganized with lots of small players. Improved market information systems and linkages represent development opportunity.	P	RGL helps aggregate farmers. Off-take contracts eliminate the need for traders and intermediaries for farmers.
	PRICING & COMPETITIVENESS Market dynamics of the main crop of the SDM, including competition between buyers and possible price-setting by the government or other parties	Tanzania's competitive prices create significant export opportunities. Yet, government intervention (e.g. export bans) struggle to balance improving incomes and food security.	N	At the beginning of every season RGL negotiates and guarantees a minimum price for the produce to reduce the exposure of farmers to price volatility
Sustainability	**ENVIRONMENTAL RISKS** Climate change, possibility of extreme weather, soil type, water supply and quality, pests and diseases. Potential environmental damages such as deforestation	The main hazards affecting Tanzanian agriculture are droughts and floods. Unpredictability and variability in rainfall has significant effects on productivity.	P	RGL offer trainings to farmers on how to mitigate this occurrences and is also working towards providing weather index insurance to further improve farmer resilience.
	SOCIAL CONTEXT Availability and quality of schooling / healthcare. Cultural factors. Potential social externalities like child labor, gender disparity	Prevalence of HIV/AIDS and malaria in rice growing regions and waterborne diseases in lowland irrigated areas has adverse effects of the farming households	P	

Climate resilience of farmers in the SDM

	Indicator	Discussion	SDM Risks & opportunities
Climate resilience	 **37.0** Climate resilience [1]	Ranked 149 in the world, Tanzania is assessed to be low in climate resilience. Tanzania has challenged by a high vulnerability to climate change (55%), coupled with a low readiness to adapt to such challenges (29%). Significant levels of investment and innovation are needed to improve better prepare the country	• Farmers training on GAP to reduce environmental impact • RGL would like to explore providing weather index insurance bundles with the loan product to increase farmer resilience to climatic shocks.
Soil	**Moderate water deterioration** [2]	Mbeya is located in the Southern highland and experiences moderate soil deterioration from water erosion but also through chemical deterioration which causes loss nutrients.	
Water	**Medium to high risk** [3]	Tanzania has a medium to high overall water risk. While baseline water stress is low, seasonal variability is high and there is a high percentage of the population without access to improved drinking water supplies	• Farmers use rain water to irrigate their crops • With changing rainfall patterns, farmers require new seedling varieties, or increased access to irrigation systems
Agro-ecoystem	 **7.04** Human footprint [4]	Tanzania has a medium environmental footprint, with the key regions for the SDM in the North and South slightly higher than the national average. Since 1993, both areas have seen a decrease in environmental impact	• Farms plots are either well diversified or follow a crop rotation scheme to maintain soil fertility.

1: ND-GAIN Country Index; summarizes a country's vulnerability and readiness to adapt to the negative impact of climate change
2: GLASOD; shows the severity of soil degradation in 4 categories: water, wind, physical and chemical deterioration
3: Aqueduct Water Risk; identifies areas with water-related risks, based on 12 subcategories such as drought severity, seasonal variability and ground water stress
4: WCS Human Footprint; measures the cumulative impact of direct pressures on nature from human activities. Scores 0-50, but national averages rarely exceed 25

Annex III: KPIs and data

This section of the annex provides a description of KPIs used and data sources

In this section you will:

- ✓ Get an overview of the service-specific KPIs used in the analysis for both farmer and SDM operator
- ✓ Get an overview of data sources used to carry out the analysis
- ✓ Get an overview of key assumptions for farmer analytics
- ✓ Get insights on how data is managed (optional)

Go back to farm-level analysis

Key assumptions for farmer analytics - Rice

	Baseline	Segment 1	Segment 2
Starting farm size [acre]	3.0	3.0	3.0
Farm size (total land) (2028)	3.0	3.0	3.0
Yield (beginning) [kg/acre/season]	1,000*	1,400*	2,400*
Yield increase [% change per year]	5%	7%	10%
Farm gate price [TZS/kg]	600	700	700
Total fertilizer application rate [kg/acre/season]	50	50	50 and 1 liter liquid booster
Seeds used	Own seeds	Own seeds	Seeds dealer
Total crop protection application rate [liters/season]	2	2	3
Harvesting method	Manual	Combine harvester	Combine harvester
Hired labor cost(TZS/Man-day)	4,000	4,000	4,000
Loan amount (TZS)	n/a	n/a	1,000,000
Interest rate [%/annum]	n/a	n/a	19%

Sources: * Data retrieved from interviews with RGL staff

Go back to farm-level analysis

Key assumptions for farmer analytics - Beans

	Baseline	Segment 1	Segment 2
Starting farm size [acre]	1.0	1.0	1.0
Farm size (total land) (2028)	1.0	1.0	1.0
Yield (beginning) [kg/acre/season]	300*	500*	800*
Yield increase [% change per year]	0%	2%	5%
Farm gate price [TZS/kg]	1,350	1,350	1,200
Total fertilizer application rate [kg/acre/season]	50	50	50
Seeds used	Own seeds	Quality declared seeds	Seeds dealer
Total crop protection application rate [liters/season]	1	1	1
Hired labor cost(TZS/Man-day)	5,000	5,000	5,000
Loan amount (TZS)	n/a	n/a	n/a
Interest rate [%/annum]	n/a	n/a	n/a

Sources: * Data retrieved from interviews with RGL staff

Go back to SDM operator analysis

Go back to CESPS scaling analysis

Key assumptions for SDM operator analytics

	Rice: Segment 1	Rice: Segment 2	Beans: Segment 1	Beans: Segment 2
Exchange rate[1)]	2,294 USD/TZS			
PPP conversion rate[2)]	727.05 USD/TZS			
Farmers accessing bank loan (1st year) [# farmers]	0	2,000	0	0
Farmers accessing bank loan (2026) [# farmers]	0	10,000	0	0
Loyalty rates [%]	75%	75%	90%	90%
Training frequency [Times/new group]	2	2	1	1
Fees for finance consulting for helping a farm group get bank loan first time(TZS/group)	n/a	7,000,000	n/a	n/a
Average storage capacity of village aggregation centers (MT/VAC)	200		300	
Number of 10MT capacity owned by RGL (2025)	6			
Number of mechanization equipment owned by RGL(2025)	4 tractors, 4 combine harvesters(paddy) and 1 mobile beans dryer (beans)			
Input costs per demo plot [TZS/acre/year]	614,713		210,017	
Average size of demo plot [acre]	1.0			

Sources: **1)** Retrieved from https://www.oanda.com/currency/converter/. Per September 30th, 2019; **2)** World bank 2018 PPP database, private consumption. 2018 is latest data available, validated on September 30, 2019;
All the remaining data were gathered from RGL staff

Annex IV: Glossary

This section of the annex includes an overview of the standard glossary terms used in the SDM analysis

Standard glossary (1/2)

Acronym	Meaning
Assets (farmer segmentation)	Minimum requirements for assets include possessions that a farmer needs prior to joining an SDM, e.g. land, financial resources.
Attitude (farmer segmentation)	Minimum requirement for attitude describes the way a farmer should feel towards joining the SDM, e.g. eager to learn, adopt new practices
Baseline	Group of farmers used as primary reference in analysis for comparison with segments of farmers in the model
Behavior (farmer segmentation)	Minimum requirements for behavior describes how the farmer acts, often attested for by government officials or elderly, e.g. trustworthiness
SDM operator/ partner	The person(s) responsible for the facilitation of the SDM case study on behalf of the investor and / or service provider
Case report	A report on one of the SDM case studies
Case study	An in-depth analysis of an SDM
CESP	Community extension service provider
Donor	Organization that provides (co-) funding but is not part of the SDM
Drivers	Variables (revenue, cost, success) impacting the viability of the model
Economic sustainability	The viability of the SDM in economic terms: the extent to which it benefits farmer, investor and service provider
Enabling Environment	Combination of institutions, infrastructure an regulatory environment that surrounds the SDM
Entities	Those organizations/businesses that are set up to provide services to farmers
Farmers Organization (FO)	Form in which farmers are organized (e.g. cooperatives, farmers aggregation, farmers organizations or other terms)
GAP	Good Agricultural Practices - codes, standards and regulations developed to codify agricultural practices at farm level
IDH	Sustainable Trade Initiative
Investor	Organization that invests (financial) resources into the SDM
Key Economic Indicators	The most important outcome variables to the SDM (e.g. change in farmer loyalty, change in farmer productivity)
KPI	Key Performance Indicators

Standard glossary (2/2)

Acronym	Meaning
Learning Questions	Those questions that drive the analysis of the SDM; the key things IDH or the case partner wants to know out of this specific case
Loyalty	The percentage of total farm production volume sold by the farmer to the buyer in the SDM
NGO	Non-governmental organization
P&L Analysis	A profit and loss statement summarizing the main revenues, costs and expenses incurred during a specific period of time during SDM operations
Remote data collection	The iterative process of collecting readily available SDM data from the SDM Operators, both before and after the field trip
ROI	Return on Investment
SDM Database	Collection of aggregated data from all case studies, with the aim to identify broader lessons long-term trends
SDM Snapshot	Overview of SDM objectives, Theory of Change, entities and services
Segment (Farmer-)	A group of farmers that is a sub-set of the total population within an SDM, sharing certain characteristics
Sensitivity Analysis	Analysis to determine how different values of an independent variable impact a particular dependent variable under a given set of assumptions
Service Delivery Model (SDM)	Supply chain structure which provides services such as training, access to inputs and information to farmers in order to increase their performance and sustainability
Service Provider (SP)	Organization that delivers one or more services (e.g. training, inputs, access to finance) to the farmer
Services	List of services to be delivered to farmers in order to attain SDM objectives (e.g. Certification, crop diversification, training)
SYT	Syngenta
Theory of Change	Overview of the process of change of the SDM towards achieving the desired outcomes
Tool	An Excel-based tool used to model an SDM's economic sustainability (P&Ls) for the famer, service provider, and investor.