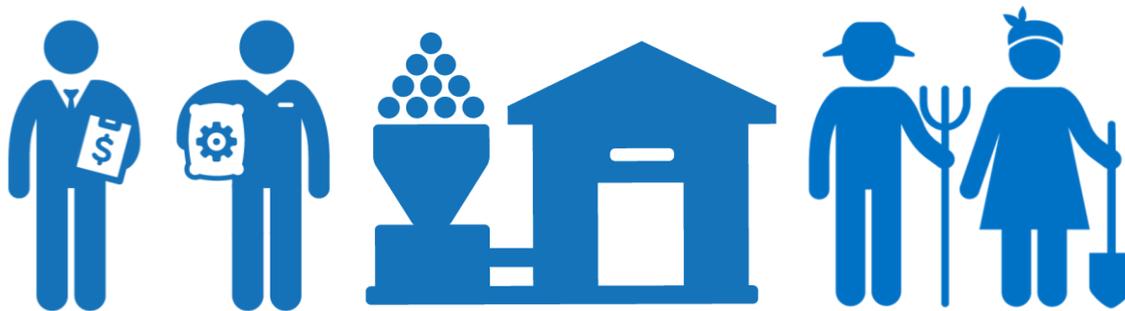


SDM: Case Report Usomi

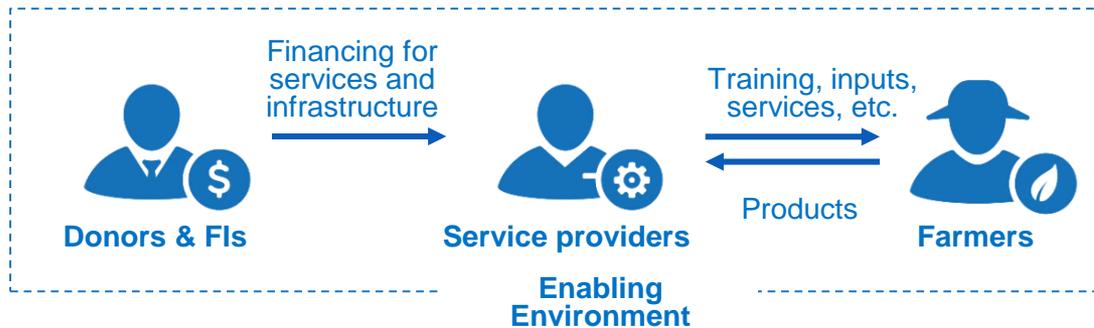
Service Delivery Model assessment: short version
December, 2019

Location: Kenya
Commodity: Finger millet & Poultry
Services: Financial services, Planting material provision, Agrochemical provision, Mechanization, Training, Farmer organization, Market linkage, Farm diagnostics



What are SDMs and why are we interested in analyzing them?

Service Delivery Models (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.



By analyzing SDMs, we aim to support **efficient, cost-effective and economically sustainable SDMs at scale** through:

Key drivers for success of SDMs benchmarking



Innovation opportunities to support



Cross-sector learning, learning community



Convening at sector and national level



Analyzing SDMs brings a range of benefits



Farmers and farmer organizations

- **Better services** improve productivity, product quality, quality of life and social and environmental outcomes
- **Better outcomes:** improved productivity, income and resilience



SDM operator

- **Understand** your model's business case
- Gain insights to **improve** service delivery
- Develop **cost-effective** SDMs based on insights
- Identify opportunities for **innovation** and **access to finance**
- **Learn** from other public and private SDM operators operating across sectors/geographies
- **Communicate** stories of impact and success at farmer level



Investors/FIs

- **Common language** to make better informed investment decisions
- Insights to achieve optimal **impact, efficiency and sustainability** with investments and partnerships in SDMs

The Usomi SDM and objectives

General SDM information:

Location:	Kenya
Timing in analysis scope:	2020-2024
Scale (start of analysis):	2000 farmers
Scale (end of analysis):	27000 farmers
SDM Archetype*:	Regional



- Usomi Limited (Usomi Ltd) is a technical service provider and aggregator of raw agricultural commodities established in 2013 and headquartered in Nairobi, Kenya. Its product portfolio includes finger millet, red sorghum, groundnuts, soya, pulses and indigenous chickens.
- Usomi Ltd started as an agritech business with a focus on data analytics and precision farming through mobile platforms for smallholder farmers producing both animal and plant based produce. As market access is key for the viability of supply chains, Usomi recently expanded their approach to market linkages and virtual aggregation.
- The counties that Usomi currently sources millet from are located in the remote Western region bordering Uganda and Nyanza bordering Lake Victoria.
- Usomi Ltd is looking to expand its operations in the coming years, with most of their product sold to domestic processors.

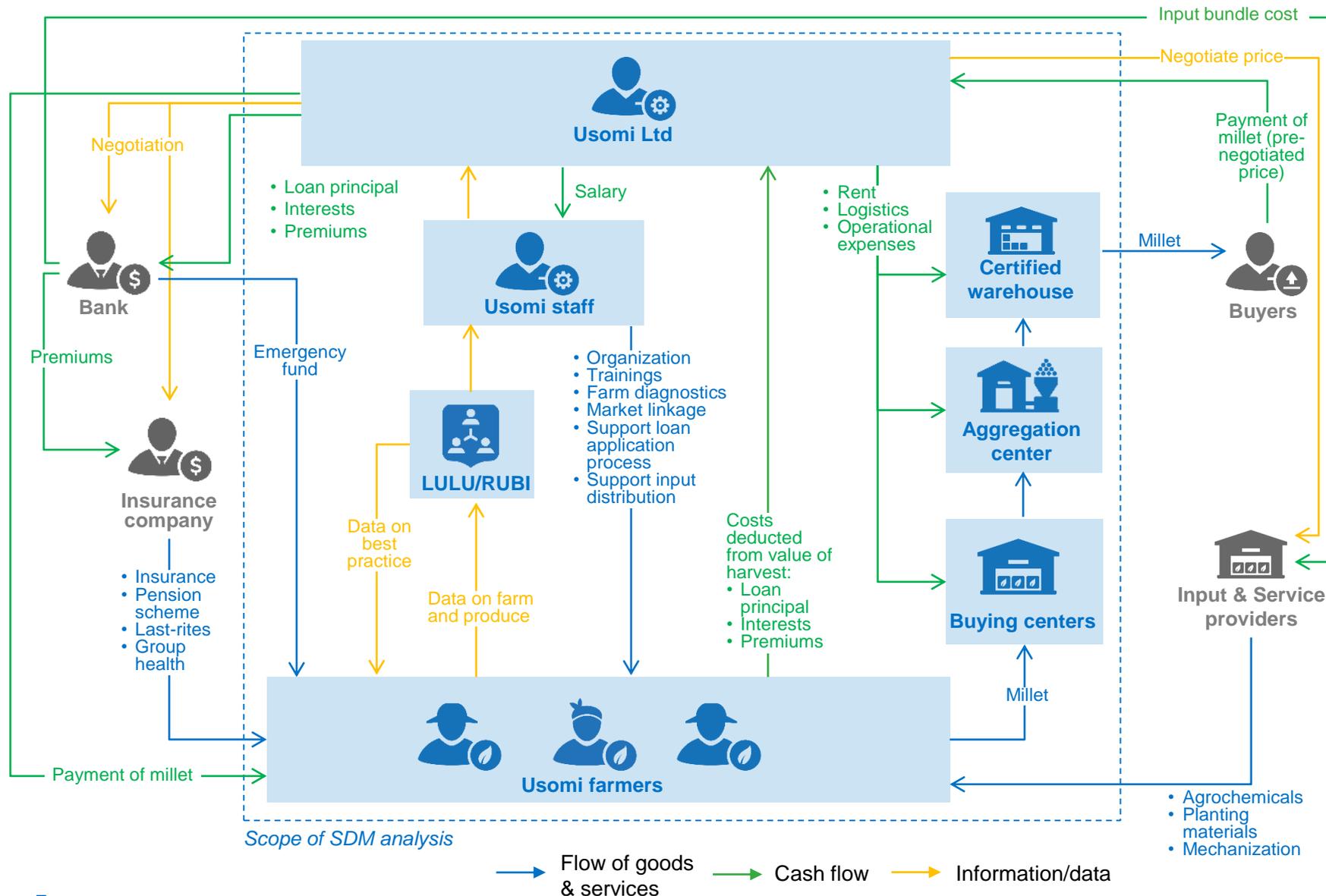
SDM objectives:

- 1 Sourcing maximization:**
Increase access of farmers to high-quality inputs, services and data-aided decision support through the use of technology and precision farming
- 2 Access to market:**
Improved access of smallholder farmers to markets through contract farming

SDM rationale:



SDM Services and Revenue Flow Overview



Enabling environment

Enabling environment

Farmers are impacted by several factors within their enabling environment. Most important are:

1. Infrastructure

The lack of collection centers by large millet processors in the Western part of Kenya makes it difficult for farmers to access markets, as the main trade hubs are in Nairobi and Mombasa. Therefore, Usomi facilitates access to market by collaborating with local farmer groups, who are managing buying centers and renting collection centers and warehouses in the areas they operate.

2. Input & Financing

The majority of farmers do not have the financial means to invest in high quality inputs and their access to inputs is low due to large distances to input markets or providers. Therefore, Usomi provides access to high-quality inputs and facilitates financing of the inputs.

3. Trading system

The informal nature of the value chain of both millet and poultry production, the high cost of transport and low regional storage capacity for farmers limits their access to markets and decreases their bargaining power. Usomi supports farmers in their access to market by aggregating produce locally and taking care of logistics (including storage and transport) to buyers.

4. Pricing

Large buyers are discouraged by high transport costs and difficulty in negotiating with individual farmers. Therefore, the majority of produce is sold through middlemen, allowing them to pay very low prices to the farmers.

Usomi signs contracts with farmers, thereby guaranteeing offtake and avoiding middlemen. Additionally, Usomi's platform Rubi allows the farmers to see the prices that the produce is sold for in the market.

Services delivered (1/2)



Financial services

- Usomi connects farmers to a local bank and insurance company to provide them with access to finance through a bundle of financial services. This bundle includes credit for agri-inputs and mechanization services, and a farmer benefits scheme (crop insurance, pension scheme, group health and last rites-insurance, and an emergency fund)



Mechanization

- Usomi provides farmers with access to mechanized labor to improve efficiency of their farming activities, such as land clearing, ploughing, harrowing, planting, application of agrochemicals, harvesting and threshing
- Farmers receives mechanization services on credit through the financial bundle. The cost of the service is deducted from the harvesting value at the end of the season by Usomi and paid back to the bank



Planting material provision

- Usomi supports farmers to access high-quality seeds as part of the bundle of services they receive after being contracted
- The input bundle includes high-quality seeds bought from well recognized seed providers
- Farmers receives planting material on credit through the financial bundle. The cost of seeds from the harvesting value at the end of the season by Usomi and paid back to the bank.



Agrochemical provision

- Usomi supports farmers to access crop protection and fertilizers as part of the bundle of services they receive after being contracted
- The input bundle includes high-quality agrochemical inputs bought from well recognized input providers
- Farmers receives agrochemicals on credit through the financial bundle. The cost of agrochemicals is deducted from the harvesting value at the end of the season by Usomi and paid back to the bank.



Training

- Usomi trains its millet field staff on GAP (TOT) on annual basis.
- Usomi organizes training to Field Technicians (TOT) on performing quality control, farmer field visits, GAP and data collection through LULU and RUBI platforms.
- Usomi provides monthly training to farmer groups on GAP, bookkeeping and Usomi's platform use through a network of Regional agronomists and Field Technicians.
- Besides monthly training with individual farmer groups, Usomi offers big group trainings to 5 farmer groups.



Market linkage

- Usomi guarantees off-take of millet to farmers joining the SDM (contract farming). Usomi stipulates contracts with large buyers at the beginning of the season before contracting farmers.
- Usomi field staff upload information regarding production volumes in the RUBI platform, which triggers sourcing operations.

Services delivered (2/2)



Farmer organization

- Usomi groups farmers from existing larger farmer groups into smaller groups of 25 farmers
- Each farmer group is led by a lead farmer. Usomi provides financial incentives, such as phone credit, to encourage them to lead the farmer groups
- Usomi organizes recruiting events on an annual basis to recruit the required farmers to meet the demand targets



Farm diagnostics

- Usomi gathers data through a wide set of technologies: drones for hyperspectral imaging, weather stations, sensor-equipped tractors used for soil quality analysis and farmer data uploaded by farmers into the LULU platform
- Usomi analyses the farm performance, crop health, soil quality and weather conditions to provide up-to-date information and agronomic recommendations to SDM farmers



Poultry input provision

- Usomi supports farmers to access 8-weeks old chicks (AUTHENTIC FI), animal feed, and disinfection and fumigation chemicals as part of the bundle of services they receive after being contracted
- The input bundle includes high-quality poultry inputs from well recognized brooders and input providers
- Farmers receive these inputs on credit through the financial bundle. The cost of inputs is deducted from poultry sales value at the end of the production cycle by Usomi and paid back to the bank.



Vaccination services

- Usomi facilitates the provision of vaccination by vets at the brooder units.
- Usomi covers part of the vet to the fee for brooders.



Training

- Usomi trains its poultry field staff on good husbandry practices (TOT) on annual basis.
- Usomi organizes training to AHAs (TOT) on performing quality control, farmer visits, good husbandry practices and data collection through LULU and RUBI platforms.
- Usomi provides a one-week training to OG1 farmers on good husbandry practices, Usomi's Elerai requirements and Usomi's platform use.
- Usomi offers information and tips on good husbandry practices through the LULU platform.



Market linkage

- Usomi guarantees off-take of poultry to OG1 joining the SDM (contract). Usomi stipulates contracts with large buyers such as Carrefour before contracting OG1 farmers.
- Usomi will off-take locally produced chickens from Subs and OG2 farmers if they comply with Usomi's quality standards.
- Usomi field staff upload information regarding volumes in the RUBI platform, which triggers sourcing operations.

Farmer segmentation – millet only

This SDM model targets different segments of farmers based on their current level of millet production and farming practices because different volumes can be sourced from each segment and specific services are offered to gain yield improvements quicker.



Baseline



Conservation Agriculture



Basic Conventional



Advanced

Minimum criteria

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

Minimum criteria	Baseline	Conservation Agriculture	Basic Conventional	Advanced
Contract	n/a	All farmers must have signed a contract with Usomi	All farmers must have signed a contract with Usomi	All farmers must have signed a contract with Usomi

Segments

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

Characteristics	Baseline	Conservation Agriculture	Basic Conventional	Advanced
Yield y1	360 kg/acre	800 kg/acre	1,000 kg/acre	1,500 kg/acre
Yield y3	360 kg/acre	1,200 kg/acre	1,500 kg/acre	2,000 kg/acre
Farm size (acre)	1	1	1	2
Loyalty rates	n/a	85%	85%	90%
Post-harvesting loss	10%	5%	5%	3%
Impurity loss	7%	5%	5%	6%
Practices	No inputs, no services	Low input, low tillage	Moderate input use, no mechanization	High input use, mechanization

Services	Baseline	Conservation Agriculture	Basic Conventional	Advanced
Inputs		Planting material and agrochemicals		
Finance	n/a	Finance bundle		
Mechanization	n/a	n/a	n/a	Access to mechanization services

Farmer segmentation - combining millet & poultry

Distribution (percentages) of farmers in various farmer segments

Farmer segments		Millet		
		BCA	BC	Adv
Poultry	OG1*	~1.5%	~6.5%	~2.0%
	OG2*	~8.7%	~34.6%	~28.8%
	Subs*	~0.7%	~2.8%	~14.4%

➔ Graduation pathways

Farmer segmentation matrix

- All millet farmers are encouraged and expected to diversify to poultry farming. Apart from millet-related segments, there are also three levels of graduation in poultry farming: Subsistence (Subs), Outgrower 2 (OG2) and Outgrower 1 (OG1).
- Usomi's strategy is to reach its demand targets while maintaining a stable production base structure (portfolio ratio). Farmers are encouraged to graduate to superior segment levels, but Usomi will manage the graduation flow and recruitment rates in various segments to keep the portfolio ratio constant while meeting the annual demand.
- Usomi expects higher adoption, loyalty and retention rates for the better performing segment levels, such as Advanced and OG1 farmers. Such farmers are expected to implement the recommended farming practices associated to their segment to reach the set yield and volume targets. Additionally, they are expected to stay in the SDM and sell more of their produce to Usomi because their businesses are more rewarding and Usomi provides them with a more comprehensive financial bundle to ensure it responds to their needs.
- Farmers can be recruited at any level of the matrix.

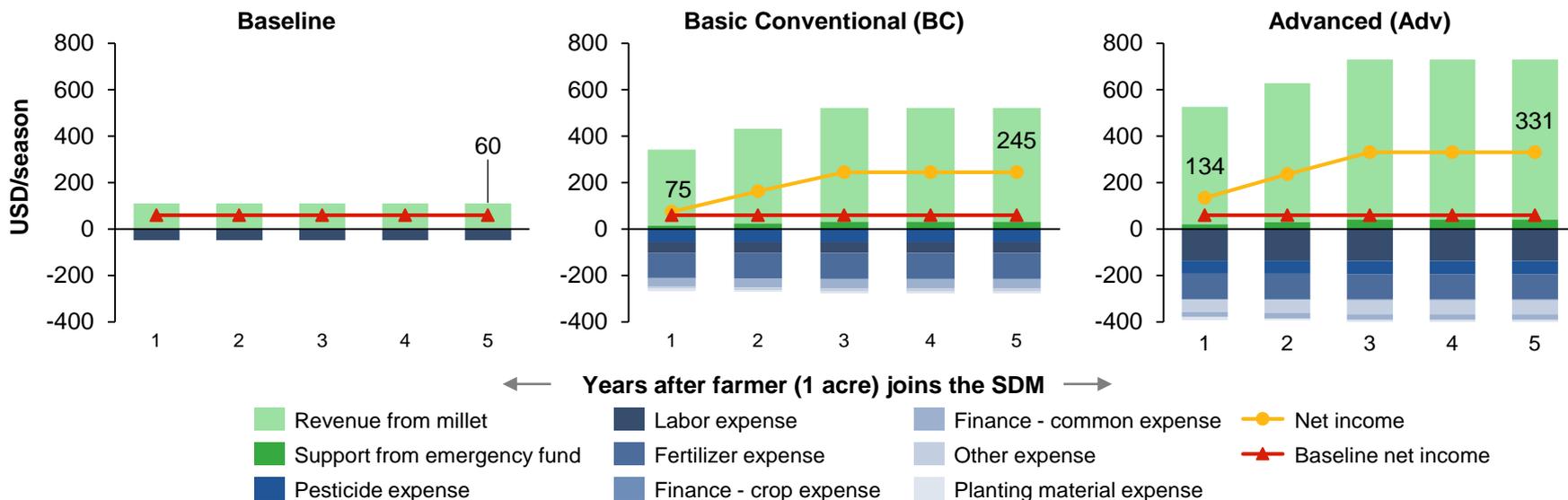
*Poultry farmer segmentation

Subs: Subsistence farmers keep very few chickens, a combination of locally bought and Usomi provided chickens. The chickens roam free and farmers are allowed to sell their chickens to any buyer.

OG2: Outgrower 2 farmers see poultry farming as a professional business. They can start with keeping 25 chickens a year and move up to 100. They are not obliged to sell their chickens to Usomi. Additionally, there are no specific requirements for OG2 farmers except from compulsory vaccinations, as Usomi chickens are mixed with local chickens. Chickens sold by OG2 to Usomi will, in turn, be sold by Usomi to local markets.

OG1: Outgrower 1 farmers are farmers bound to Usomi by contract. The requirements to become OG1 are the following: 0.50 acre of land available, a fenced chicken farm, an appropriate poultry housing and use of only the Usomi provided animal fee. They can only buy chicks from specific brooders (supported by Usomi) through Usomi, need to grow the chickens under very strict health requirements and cannot sell their chickens to anyone but Usomi. These chickens will be sold by Usomi as their own brand Elerai. OG1 farmers receive one-week intensive training on poultry farming and are supposed to maintain between 100 and 1000 chickens per cycle.

Overall SDM impact: Farmer P&L - Millet



Economic sustainability at farm level

The above graphs show the P&L of millet farming for one season. To maintain the quality of the soil throughout the years, Usomi requires farmers to rotate millet with soybeans or ground nuts on an annual basis. SDM Basic Conventional and Advanced farmers are expected to earn much more than a baseline farmer due to increased earnings stemming from improved yields (by adopting GAP and applying high-quality seeds & agrochemicals). Similarly, Advanced farmers are expected to have a higher yield than Basic Conventional farmers as a result of applying more agri-inputs and using mechanized labor.

From year 3 onwards, Basic Conventional and Advanced farmers are expected to achieve their peak benefits from participating in the SDM, 245 USD and 331 USD per acre respectively. It is key to note that all above graphs represent the net income for one-acre farms. However, Advanced farmers will grow millet on a two-acre farm and are expected to earn an annual net income of 662 USD.

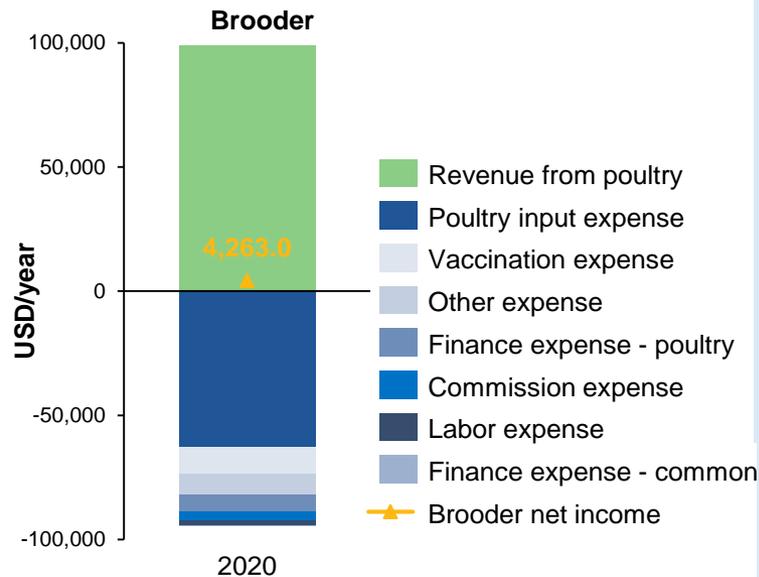
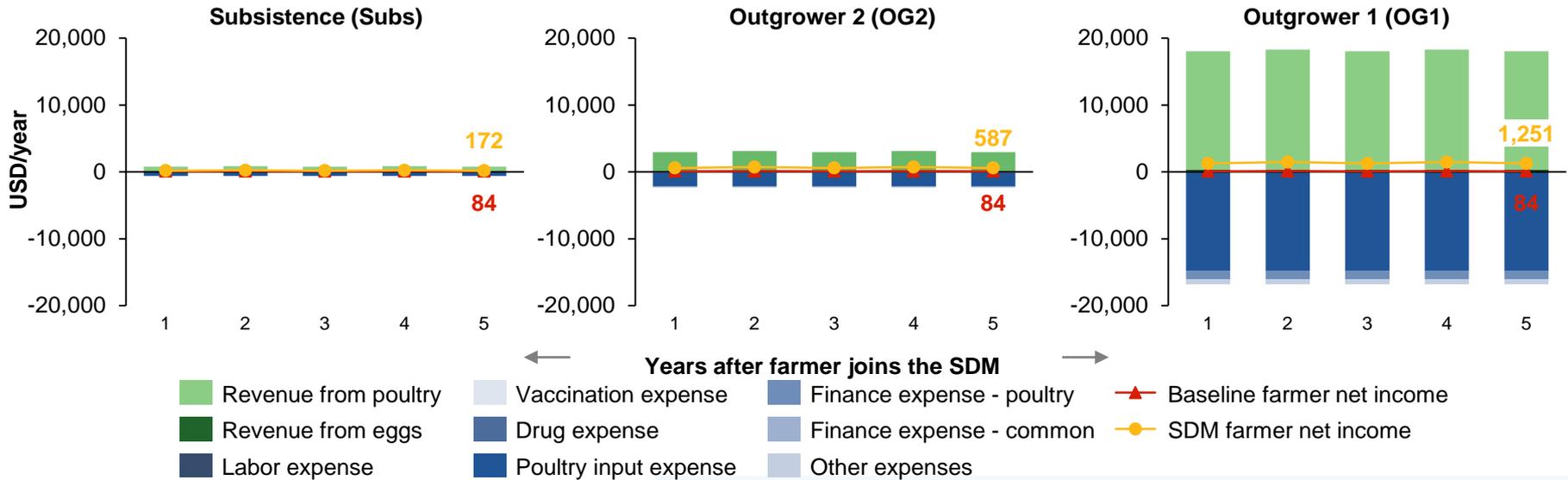
Main cost drivers

- **Agrochemicals:** While a baseline farmer does not use agrochemicals, the purchase of agrochemicals represents the major cost driver for SDM farmers. Pesticides represent 40% and 28% of total costs for BC and Adv respectively, while fertilizers represent 17% and 14% respectively.
- **Labor:** The major cost driver for baseline farmers is labor (96%), particularly planting, weeding and winnowing activities. Labor costs for BC farmers slightly increase by 15%, while for Adv farmers it would nearly triple due to the use of mechanization. Labor costs represent 15% and 35% of all expenses for BC and Adv respectively.
- **Finance:** The financial bundle represent approximately 15% of the total costs for all Usomi farmers. The category Finance-crop includes expenses associated specifically to millet (agri-inputs credit and interests), while Finance-common expenses consist of the premiums for last-rites insurance, group health insurance and pension schemes.

Main revenue drivers

- **Production:** Farmers can increase their yields by adopting GAP and applying high-quality agri-inputs. These improvements are expected to lead to an increase in sales revenues of 299% and 475% for BC and Adv farmers respectively.
- **Price:** Although the farmgate price for baseline farmers would be higher, their net income would be on average 5 times lower due to lower yields.

Overall SDM impact: Farmer P&L - Poultry



Main cost drivers

- **Inputs:** Poultry inputs are the main cost driver for the Usomi farmers with a minimum of 85% of total expenses. For brooders it represents 67% of all expenses.
- **Animal feed:** Animal feed which is considered part of poultry input, represents 10% of total input costs for the subs and OG2 farmer and 17% of total input costs for the OG1 farmer. However, for brooders it represents 62% of their poultry inputs as their business relies on the quick weight gain of the chicks.
- **Finance:** The financial bundle represent approximately 7% of the total costs for all Usomi farmers except Subs farmers. The category Finance–poultry includes expenses associated specifically to poultry (input credit and interests), while Finance–common expenses consist of the premiums for last-rites insurance, group health insurance and pension schemes.
- **Vaccination:** Vaccination is a requirement for poultry brands, therefore it represents a large expense for brooders (11%). Since OG1 farmers buy vaccinated chickens from brooders, there is no expense for them. Subs and OG2 farmers also have low vaccination costs as they only sporadically vaccinate few chickens.

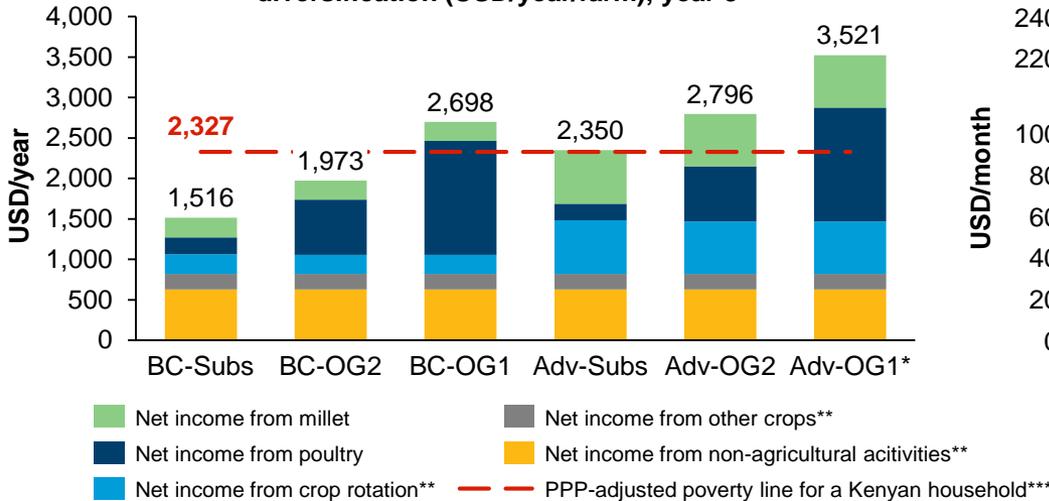
Main revenue drivers

- **Price:** Although, the farmgate price for local chickens would be 17 percent higher than for Usomi chickens, baseline farmers' net income would be min 10 times lower compared to a Subs farmer due to lower production levels and survival rates.
- **Eggs:** Subs and OG2 farmers earn approx. 5 % from their revenue from selling eggs.

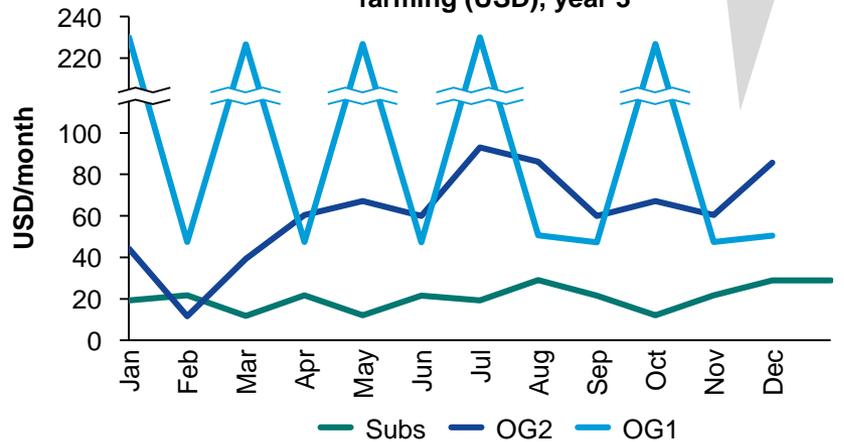
Diversification strategy for millet farmers

OG1, OG2 and Subs farmers sell their Usomi chickens every two months

Average annual net income including income diversification (USD/year/farm), year 3



Monthly cash flow from poultry farming (USD), year 3



Increased income security

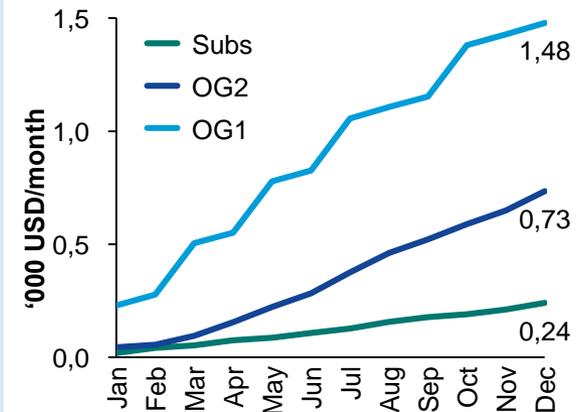
Usomi plans to encourage its farmers to engage in other farming practices, such as poultry farming, to diversify their revenue streams. When considering income from other crops and non-agricultural activities, both BC farmers pursuing OG1 poultry farming and Adv diversifying into poultry farming (Subs, OG2 or OG1) are expected to earn an annual net income higher than the Kenyan poverty line (2,327 USD/HH/year).

By having two stable income streams, SDM farmers can even out their cashflows across the year and reduce distress during cash-constrained times. With increased and steadier income throughout the year, SDM farmers are expected to have:

- more funds to buy food and to increase the level of food security
- an improved bankability, as they represent a lower credit risk for a financial institution
- fewer liquidity issues during potential cash-constrained times to purchase high-quality agri-inputs.

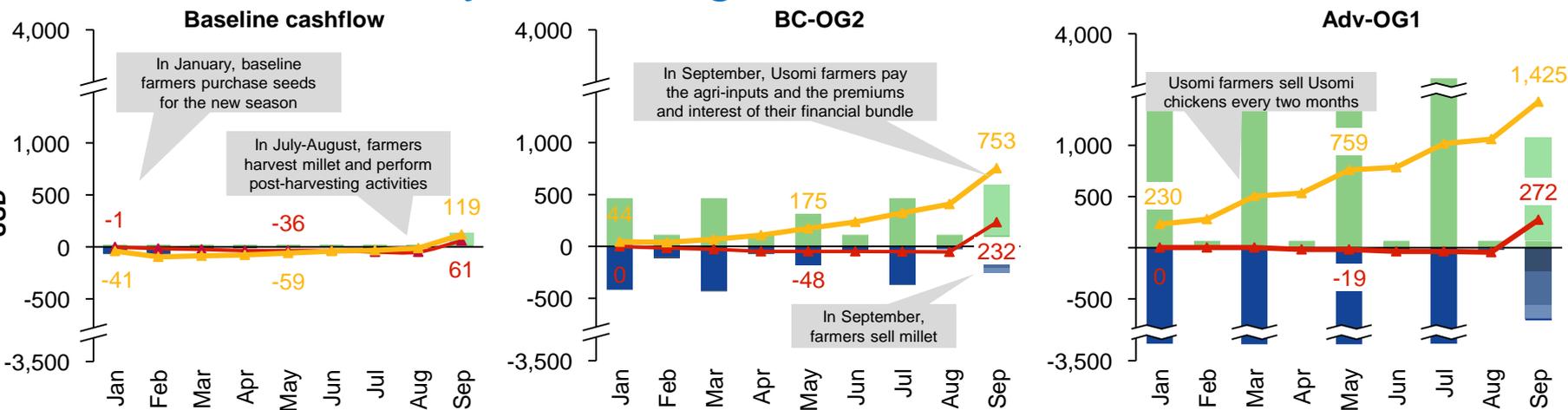
Other potential benefits of exploring diversification strategies are the use of millet as poultry feed or the use of chicken manure as organic fertilizer for millet farming.

Cumulative monthly cash flows from poultry farming ('000 USD), year 3



*: The x-axis shows combinations of millet and poultry farming by Usomi farmers. BC= Basic Conventional, Adv= Advanced, Subs = Subsistence, OG2 = Out-grower 2, OG1 = Out-grower 1
 **: Net income from other crops and non-agricultural activities is gathered from the PDC. Net income from crop rotation represents the income Usomi farmers generate by growing soya or groundnuts during the season they do not grow millet
 ***: The World Bank's poverty line of 1.9 USD/person/day, corrected for purchasing power, requires a net income in Kenya of 332,5 USD/person/year (34,851 KES/person/year). As a household consists of 7 members this equates to 2,327 USD/household/year.

Farm cash flow cycle throughout the main millet season



Proportion of Usomi farmers facing cash constraint over the year

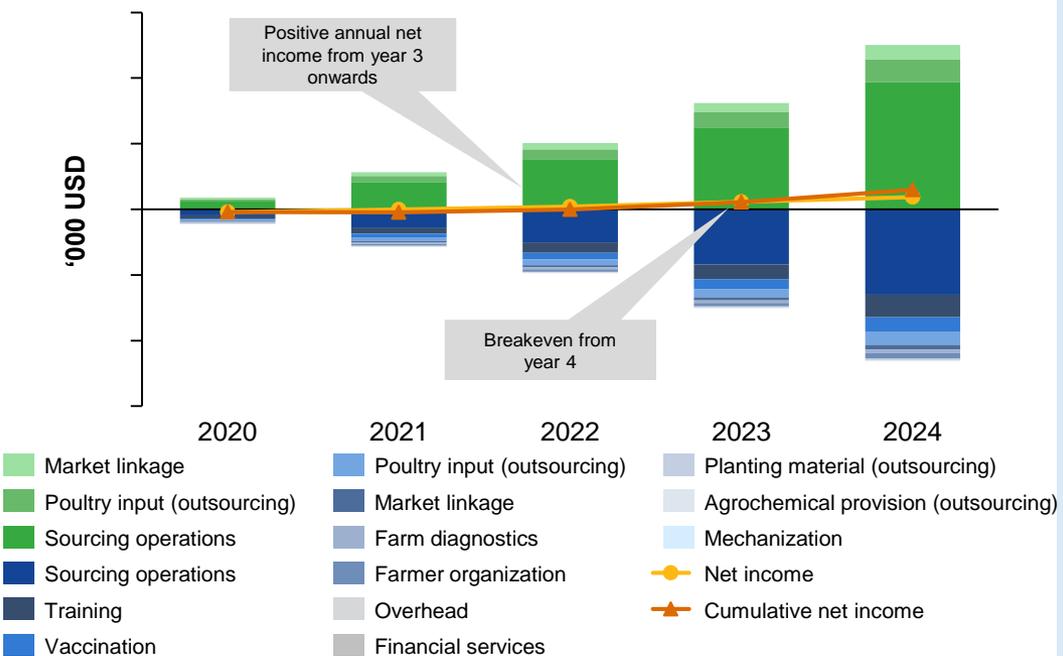


Improved monthly cash flows

- The graphs show the expected monthly cash flows from millet and poultry farming throughout the main season (from January till September) for baseline and SDM farmers in year 4. The primary data collection (above table) showed that SDM farmers are mostly cash-strapped during January to February and April to May. Traditionally, the beginning of the farming season coincides with expenses associated with agri-inputs and hired labor costs for land preparation and ploughing. The period between March and May coincides with farmers hiring labor for planting and applying agrochemicals.
- During the main millet season, SDM farmers are expected to have a higher cumulative cash flow as compared to baseline farmers (1,425 USD and 753 USD for Adv and BC farmers respectively compared to 119 USD). In January, if SDM farmers have residual savings higher than 61 USD (due to an increased net income from the previous season), then the cash balance of farmers is expected to stay positive throughout.
- The financial bundle provides SDM farmers with more liquidity. As a result of access to credit, SDM farmers can pay agri-inputs at the end of the season when receiving the revenues from millet sales. Through this, cash flow shortages would no longer constrain farmers to purchase high-quality inputs during cash-constrained times. The pension scheme, group health and last-rite insurances, and emergency fund also contribute to less financial stress by providing a financial buffer during traditionally cash-constrained times to be used for non-agricultural expenses.
- The impact of Usomi's bundle is clearer for Advanced farmers as they do not incur labor expenses throughout the season. This stems from farmers receiving the mechanization services on credit and paying the related costs at the end of the season when receiving the revenues from millet sales.

Millet and Poultry combined SDM P&L including sourcing

Overall SDM P&L by service ('000 USD)



Combined SDM sustainability including sourcing

- The SDM combining millet and poultry is expected to become profitable from year 2022 onwards.
- In the short term, Usomi is financially strapped due to large training, vaccination and poultry input costs. However, the large poultry sourcing revenues can leverage the negative annual net income from the millet SDM between 2020 and 2023.
- The cumulative SDM net income becomes increasingly negative over the first two years, after which it increases sharply.
- Usomi reaches breakeven in 2023 when both the millet and poultry service delivery models generate positive net incomes due to economies of scale. This highlights the need for capital to cover the first three implementation years, however also the business opportunity for Usomi if they can access additional capital.
- The combined service delivery costs and sourcing costs per farmer provide a similar view as the millet and poultry SDM severally. Service delivery costs decrease significantly due to economies of scale, however sourcing related costs per farmer (logistics, infrastructure and financing) increase because of the increase in their variable cost components.

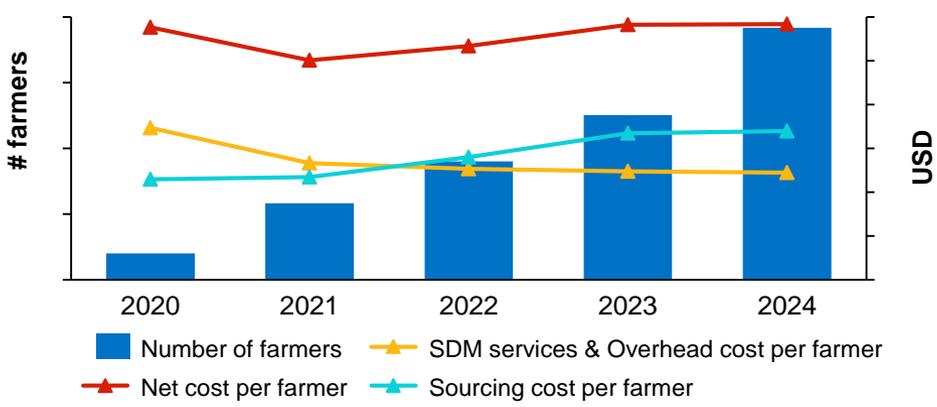
Main revenue drivers

- By combining both SDMs, Usomi can generate revenues from three different areas: 1) commission for providing market access to poultry farmers and brooders, 2) the margin on sales of high-quality chicks to brooders and 3) the margin on sales of both millet and poultry.
- However, Usomi can generate additional revenue streams from performing part of the service delivery for millet specific service in-house.

Main cost drivers

- Usomi offers a broad range of services with all of them but market linkage and poultry input provision operating at cost. The largest cost drivers are sourcing (54%), training (16%), vaccination (10%) and poultry input (10%).
- Staff salaries remain a key driver for the high operating costs.

Number of farmers in the SDM and net costs per farmer (USD/farmer)



SDM outcomes and main learning questions (1/4)

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

 <p>SDM Structure</p>	<p>1) What are the challenges and risks in scaling-up?</p>	<p>Since the SDM serves a demand driven business model, the main bottleneck for scaling-up is the number of farmers required to meet the demand targets. Number of farmers required, in turn, drives the amount of field staff that Usomi has to deploy (staff salaries are the largest cost category of the SDM). There are several factors/risks that can influence the number of SDM farmers to be engaged:</p> <ul style="list-style-type: none"> • Side-selling: A 15% lower loyalty rates than the current base case would make it impossible for SDM to breakeven within the first 5 years. Low farmers' loyalty leads to an increased number of Usomi field staff to be deployed on the ground as the number of farmers required to meet the demand increases. • Farmers leaving the SDM: The SDM would not be able to achieve a breakeven within 5 years if retention rates turn out to be 25% lower than the ones currently assumed. Several factors influence farmer retention, including loan approval rates, default rates, and satisfaction level of farmers, and availability of alternative service providers. • Stagnating yields: Lower yield levels lead to an increase in number of farmers required to meet demand targets that consequently translate into an increased amount of Usomi field staff. There are several factors that can influence yield levels. Poor farming practices from inappropriate adoption of GAP and external shocks, such as the sudden spread of pest and diseases, constitute the key potential risks for SDM farmers' productivity and, thus, SDM profitability. • Climate change risk: Increasing frequency and severity of droughts in Kenya is a major risk for both farmers and Usomi. Extreme climate events can compromise supply volumes and hinder the capacity of Usomi to meet the demand volumes agreed with the buyers. • Operational risks: Usomi is planning to launch a very holistic and complex SDM covering all the key services. Such complex design requires very cautious implementation. Lacunas in operations (lack of coordination, missing deadlines etc.) would jeopardize business relationships with buyers and farmers.
	<p>2) What is the current structure of the SDM, and what improvements are necessary to enable scale-up?</p>	<ul style="list-style-type: none"> • Usomi plans to provide eight services starting in 2020: training, market linkages, provision of agrochemicals and planting materials, farmer diagnostics, farmer organization, financial services, and mechanization. Of which the latter two will be provided through partner institutions. The Usomi apps RUBI and LULU are a core part of the SDM, as they enable the provision of two services: market linkages and farmer diagnostics. • Three main segments were identified for millet farmers: Basic Conventional (BC), Advanced (Adv) and Basic Conservation Agriculture (BCA). All millet farmers are assumed to start poultry farming activities. Poultry farming is segmented into: Subsistence (Sub), Out-grower 2 (OG2) and Out-grower 1 (OG1). Based on this segmentation, Usomi is able to profile farmers according to their millet and poultry practices. Farmers starting as BC are expected to graduate to Adv within three to six years after joining the SDM (depending on adoption rates). Because of higher expected demand in the future years and attrition of farmers in the program, Usomi will have to recruit new farmers on an annual basis. Usomi intends to maintain a relatively fixed farmer segment portfolio ratio (around 45 % BC, 45% Adv and 10% BCA). • From an organizational and structural point of view, some areas of improvement to be further explored are: <ul style="list-style-type: none"> ○ Identify cost synergies between millet and poultry value chains from an operational perspective (e.g. create hybrid staff that can work on both value chains, provide joint trainings for both value chains) ○ Create an app/tool based on the new farmer segmentation matrix to profile farmers across operating counties in order to monitor the graduation process and other parameters (e.g. retention, yield improvements, etc)

SDM outcomes and main learning questions (2/4)

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

	<p>3) Is the SDM financially sustainable in the long run?</p> <p>4) What are the key drivers that impact financial sustainability? Is there a room for improvement?</p>	<ul style="list-style-type: none"> • Including revenues from sourcing, the SDM is expected to become financially sustainable in the mid-term. The SDM is expected to generate revenues only through their commercial activities. In the short term, the annual SDM net income is negative due to large sourcing and staff salary costs and reaches a positive annual net income from year 2023 onwards (year 4). Cost-efficiency gains due to economies of scale enable the SDM to breakeven in 2024. • Key drivers for financial sustainability are loyalty rates, retention rates, and yield levels. These factors directly determine the number of farmers required to meet demand targets, and, therefore, the field staff required to meet the demand targets (see Learning question 1 for more details) and other relevant costs. • The activities/services incurring the largest costs are sourcing (58%), training (23%) and access to market (6%). Staff salaries, operational and logistics expenses are key drivers for the high sourcing costs. • Margin on sales of millet is also a key driver for financial sustainability, as it is the only revenue stream for the SDM and Usomi offers all the services free of charge. Therefore, the SDM is highly sensitive to changes in prices. One strategy to improve the financial sustainability of the SDM is to diversify the revenue streams by internalizing the provision of planting material and agrochemicals. • Other strategies that are useful to explore: <ul style="list-style-type: none"> ◦ Identify cost synergies between millet and poultry value chains (see Learning question 2) ◦ Support and incentivize BC farmers to increase their land to 2 acres and beyond. In this way, the number of farmers required to achieve the demand target will be reduced and consequently SDM's service provision costs.
	<p>5) What is the impact of the SDM on farmer's income?</p>	<ul style="list-style-type: none"> • The major economic benefit for SDM farmers is the additional income generated through adoption of improved agricultural practices, improved cashflow during the times of cash or food constraints, ensured access to market and the increased stability of income due to the contract that they sign with Usomi. • Over the course of three years, SDM farmers are able to increase their income from 50 USD/acre per season for baseline farmers to 240 and 313 USD/acre per season for Basic Conventional (BC) and Advanced farmers (Adv) respectively. The key drivers of this increase are the continuous training provided by Usomi, tailored recommendations for input application rates through precision farming technologies, increase of yields due to adoption of GAP, and use of mechanized labor (only Adv farmers). • The financial bundle enables farmers to have access to high-quality agrochemicals and other financial instruments (e.g. crop insurance, pension scheme, emergency fund, group health insurance, last-rite coverage). These together contribute to improve the financial position and resilience of the farmers. This is especially important because the expected farmer income will not provide a financial buffer (comparing with poverty line) for farmers and will remain highly sensitive to external factors such as price fluctuations, weather conditions and pests.

SDM outcomes and main learning questions (3/4)

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

 <p>Farmers</p>	<p>6) What is the impact of diversification to poultry farming on millet farmer's income?</p>	<ul style="list-style-type: none"> • SDM farmers are encouraged to engage in poultry farming activities to diversify their revenue streams. By having two stable income streams, SDM farmers can even out the monthly cashflow fluctuations over the year and reduce distress in periods of cash/food constraint. The analysis showed that by diversifying to poultry farming, SDM farmers are able to earn an annual net income higher than the Kenyan poverty line (2,327 USD/HH/year). With an increased and steadier income throughout the year, SDM farmers also represent a lower credit risk for a financial institution, and may enjoy lower interest rates in future.
 <p>Application & Impact</p>	<p>7) What is the impact of the SDM on food security and nutrition?</p>	<ul style="list-style-type: none"> • The SDM has a significant impact on food security and nutrition: <ul style="list-style-type: none"> ○ The SDM contributes to generate additional food available for use by the household across the year. By contract, SDM farmers can retain 10% of their millet production (with a maximum of 270 kg/season) for own consumption. Millet is highly suitable for storage, therefore, SDM farmers can use the retained millet during periods of food insecurity (generally April to May). ○ Besides providing an additional income source, diversification into poultry farming has proven to be an effective enabler of the household's food availability. SDM farmers can benefit from highly nutritious proteinaceous meat and eggs from the retained chickens (chickens not sold) to overcome the periods of food insecurity. The expected combined annual income from millet and poultry farming would also help SDM farmers improve their food security. ○ Access to financial instruments such as group health insurance, crop insurance, last-rite coverage etc. give farmers some security to manage essential household-related expenses (incl. purchasing of food) in the periods of food and cashflow stress.
	<p>8) What is the impact of conservation agriculture (CA) & precision farming practices on farmers' income/resilience?</p>	<ul style="list-style-type: none"> • SDM farmers adopting CA practices (BCA segment) are expected to earn a net income very much similar to BC farmers (only 2.1% lower). Although, revenues from selling millet is estimated to be much lower due to expected decreases in production volumes, BCA farmers are able to recover the expected revenue reduction by saving on several costs, especially cost of pesticide, labor and financing. • The combination of precision farming technologies with CA practices is extremely effective for not only farmers but also Usomi and the surrounding environment. Precision farming technologies such as drones for hyperspectral imaging, weather stations and sensors-equipped tractors can provide real-time information for Usomi to provide tailored recommendations to farmers (e.g. the right amount of inputs to be used on a seasonal basis). In the long-term, this can lead to reduced input purchase costs as CA practices will improve the structure and nutrient retention of the soil.

Conclusions: key drivers for success and key risks



Key drivers of success

Establishing a **strong relationship with farmer communities** is a key enabler of improved farmer loyalty & retention, and farmer investment (land under cultivation) towards SDM crop. Usomi is ensuring it in several ways:

- A high number of touch points with farmers per season and high ext. worker to farmers ratio ensures quality interaction.
- Contractual commitment will contribute to the establishment of trust with farmers and, therefore, farmer loyalty & reliability of supply.
- Remuneration of lead farmers helps to build engagement and motivation amongst farmer communities.
- Farmers will benefit from the financial bundle, which includes several financial instruments to improve their economic resilience (thus, loyalty)

A **well-rounded service package** (incl. access to finance bundle) for free, addressing all the key farmer challenges, will ensure high adoption, investment by farmers and graduation, in turn high millet productivity

Diversification into poultry farming will improve the annual income and monthly cashflow situation of millet farmers.

A **clear farmer segmentation and graduation strategy** is a key driver of success as it ensures the design of an efficient and effective SDM.

- Usomi has a solid understanding of the farmer segments in its supply base and their specific needs.
- A successful graduation process will benefit both individual farmers (increased income) and Usomi (improved cost efficiency of sourcing).
- Piloting a Conservation Agriculture segment is a strategic way to explore other potential pathways that can ensure resilience of farmers and of the SDM towards climate change events.

The **data-driven approach** enabled by the use of technology contributes to improved SDM performance:

- The well developed data collection & management system (RUBI & LULU) enables Usomi to closely monitor its supply chain.
- The adoption of precision farming technologies will increase SDM's impact at farm level through real-time agronomic recommendations and enable higher quality of produce and sourcing volumes.



Key risks

Scaling bottleneck: the number of farmers required to achieve demand targets

- The number of farmers required to meet demand targets directly drives the number of Usomi field staff required (which is the major cost driver of the SDM). Factors, such as side-selling, farmer retention and average yield levels, are all crucial to determine the number of farmers needed per unit of millet volume sourced.

Low availability of Advanced farmers can hinder SDM financial viability

- Advanced farmers can either come from BC farmers graduating to the Advanced segment or newly recruited farmers.
- A lack of availability of Advanced farmers (due to a failing or slower graduation process, or due to lack of recruitable farmers with the minimum requirements) can hinder the financial sustainability of the SDM, as Advanced farmers are assumed to produce higher volumes as compared to BC and BCA farmers.

Dependency on one revenue source makes the SDM vulnerable to market dynamics

- The SDM solely depends on commercial revenues from millet sales to cover its costs. If the margins on millet sale are narrowed (because of changes in farm-gate price and/or market price) the SDM will cease to be viable.

Dependency on diversification and graduation for SDM farmers to reach a sustainable livelihood

- Millet contributes to 10-25 percent of income required to reach the poverty line. If farmers are not able to increase land size and graduate, the farm impact of SDM is undermined.
- Usomi should collaborate with farmers to set up a crop rotation system allowing for their land to always be used 100 percent.



Lessons learned during the study exercise



Opportunities for improvement

Service delivery:

- Internalize the provision of planting material and agrochemicals to reduce SDM costs & time to breakeven, and improve the reliability of the model. Charging for the last mile delivery (currently planned as a free service) will further prepone breakeven.
- Similarly, internalizing sourcing operations will also reduce cost.
- Design and implement a new integrative M&E system to monitor agronomic performance of SDM farmers by Integrating geographical data, farmer profiling based on the new segmentation matrix, data from precision farming technologies and sourcing information into one platform. This would enable Usomi to track and control variables, such as retention rates, loyalty, adoption and yield improvements, in a targeted manner and to generate more accurate forecasts to support strategic decision making.
- Further explore synergies between poultry and millet focused operations (e.g. appointing hybrid Usomi staff that can operate in both value chains, designing joint trainings and using waste streams from one value chain in another)
- After finetuning the model in the first year as planned, scaling–up more aggressively or/and keeping higher proportion of larger farmers (Adv. segment) than planned will prepone the break even

Farming:

- Encourage and enable farmers to expand their farm land. A larger farm size can increase farmer's income and at the same time improve SDM's service provision cost efficiency.
- Use the graduation system to select 'mentor' lead farmers that can support newer leader farmers developing group management skills.

Commercial operations:

- Explore the financial impact of internalizing sourcing operations to reduce the costs of logistics and cleaning & grading.



Key factors in replication of the model

Service delivery:

- Usomi has adopted a **holistic approach** to deliver services to farmers, in an effort to address all the enablers and risk mitigation relevant to millet farmers' growth
- Usomi is working towards **ensuring strong relationship** with farmers, which is one of biggest success drivers for any SDM. **Signing of contracts** and the provision of a **financial bundle** reduce the chance of side-selling and contributes to the establishment of more professional and disciplined business engagement.
- Usomi will aggregate the demand of agri-inputs from farmers to improve bargaining position and **negotiate lower agri-inputs prices** for its farmers. This helps farmers reduce their cost of production while availing high-quality agri-inputs.
- Having a **clear understanding of farmer segments** during the design phase of an SDM is helping Usomi to make targeted interventions and investments to improve the efficiency and effectiveness of the SDM.

Farm-level:

- Usomi is **piloting Conservation Agriculture farming practices on a smaller scale** (10% of Usomi's farmer base) to test their potential before scaling up. In this way, Usomi can minimize the risks in short-term, learn from pilot and improve the model before launching a full-fledged conservation agriculture farming program.



Recommendations/Opportunity pathways

1. Find sources of short-term financing to fund the first three years of the SDM

- Under the current assumptions, the SDM is estimated to become profitable only in year 4. Usomi can benefit from receiving capital (either in form of a donation or a loan) to absorb the losses of the first three years.

2. Invest in in-house agri-input provision

- Internalization of agri-input provision (fertilizer, crop protection and planting materials) can not only increase the reliability of the agri-input provision operations but also reduce the overall SDM costs. The analysis showed that Usomi can recover all the additional annual costs of internalizing agri-input provision and, at the same time, offer further reduced agri-input prices to its farmers and/or retain some margins during agri-input sale to farmers. Internalizing the agri-input distribution process may also have beneficial effects on sourcing operations too (e.g. purchased trucks for input provision can be used during the harvesting period for sourcing operations).
- Usomi should further analyze impact of internalizing other sourcing operation, such as cleaning, weighing and grading on SDM efficiency

3. Usomi needs to invest in the organizational capacity building

- Usomi is planning to launch a very complex SDM covering all the key services. Such complex design introduces operational risks and requires very cautious implementation. Usomi need to set-up/beef-up appropriate internal teams, ensure right coordination systems and ensure necessary capacity building to enable smooth operations.

4. Continue investing in developing a high-tech Conservation Agriculture segment

- The analysis showed that BCA farmers (pilot scale) are expected to not only benefit from the sustainable farming practice of conservational agriculture that will help them build resilience against climate change but also can earn similar income (only 2% lower) as BC farmers. Improve farmer resilience will, in turn, improve security of supply for Usomi in the long-term.
- With this initiative, Usomi also has the opportunity to become a frontrunner in Climate Smart Agriculture in Africa. Usomi, first, needs to learn from current CA pilot and improve the model. And, then, design & evaluate launching a full-fledged high –tech conservation agriculture farming program that combines precision farming technologies (included in current SDM) and the improved CA model.

5. Develop an integrated M&E system

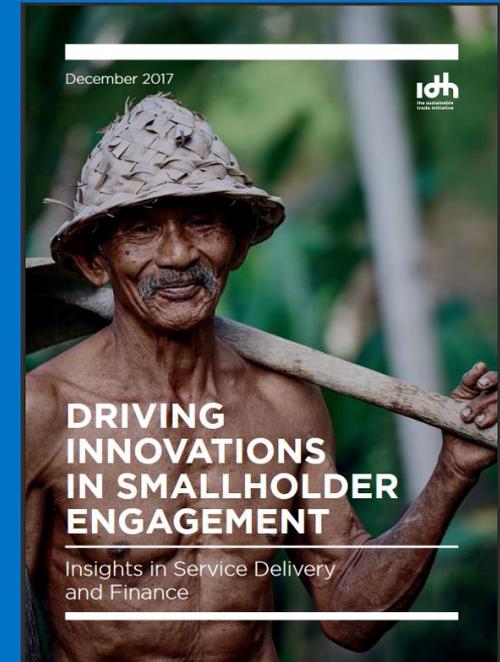
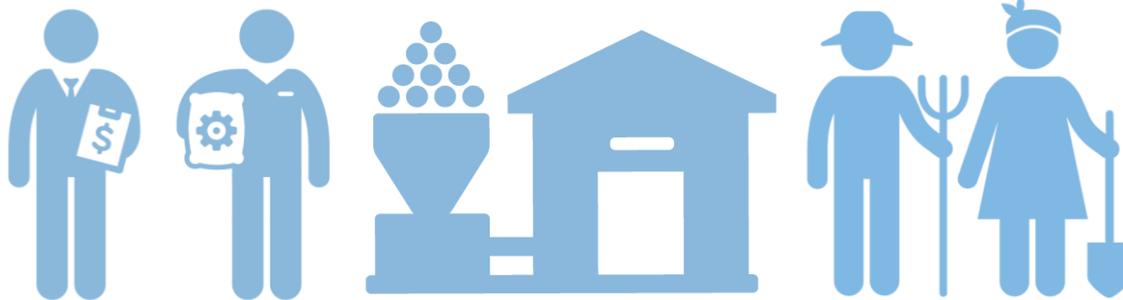
- Bringing and processing all the data in a singular platform will improve Usomi's ability to monitor the overall implementation process more closely as well as support targeted & robust decision making.
- Further develop the RUBI/LULU platforms by plugging-in the newly developed farmer segmentation matrix to profile and geo-locate farmers. This can facilitate the monitoring of crucial success drivers (in relation to its supply base) such as retention rates, loan approvals, loyalty rates, yield levels etc. at a segmentation level.
- Information gathered through precision farming technologies combined with a more accurate monitoring of the supply base can also enable Usomi to explore flexible premiums to farmers.



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For more information and insights on SDM's, see the [IDH Smallholder Engagement Report](#)