# Agri-wallet Service Delivery Model Assessment

**21 October 2019**

the sustainable trade initiative

Dalberg

mastercard foundation

Rural & Agricultural Finance LEARNING LAB

# **Project goals** | The objective of this project is to understand how Agri-wallet can sustainably serve its stakeholders

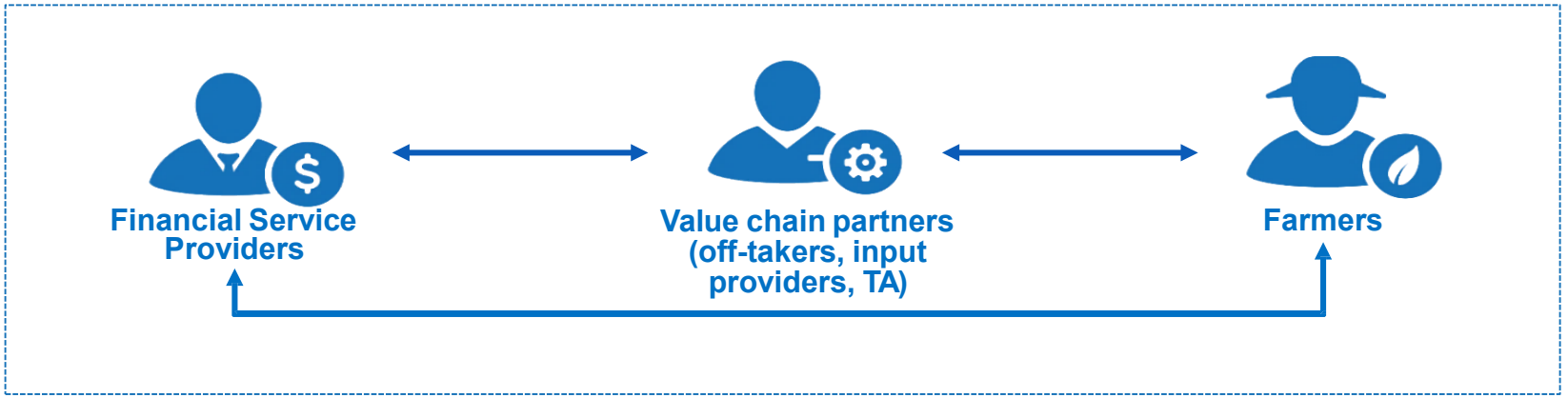
1. A thorough understanding of the conditions under which **Agri-wallet can thrive financially** while unlocking **benefits across stakeholders**

2. An understanding of the **level of "subsidy" needed** to scale Agri-wallet model sustainably and effectively

3. A set of **materials and tools** that Agri-wallet's team can use for strategic and business planning, better customer marketing, reshaping of partner negotiations and fundraising

# **Project approach** | The SDM approach is a holistic, data driven, strategic assessment of the sustainability of smallholder delivery models

*Scope of analysis*




To what extent and under what conditions can smallholder finance create sustainable returns for key actors involved in the service delivery model

- ✓ Financial service provider (“FSP”)
- ✓ Value chain partners (“VCP”)
- ✓ Smallholder farmers

# Executive summary: Agri-wallet context

## Context and Agri-wallet's potential impact

- Agri-wallet is a start-up in Kenya working to improve food security and reduce poverty by **providing trade and input finance to under-served farmers, buyers and input providers**. It provides a blockchain-based **digital wallet account in which savings and credit are 'earmarked' specifically for spend on income-generating activities** i.e. agricultural payments and inputs.
- Agri-wallet is pivoting from testing and validation to scaling in Kenya and other markets; across various crop types, it aspires to provide **2.3m annual overdrafts to farmers worth €460m** with **3.3m** farmers registered on the platform by 2024 (predicated on international expansion, as the company envisions that of the total farmers registered on Agri-wallet's platform by 2024, Kenya will make up ~24%).
- This case study explores the financial sustainability of Agri-wallet services and the potential impact of Agri-wallet on farmers, buyers, aggregators, and input providers, **focused on Kenya only** given Agri-wallet's existing footprint. It also highlights opportunities to generate more shared value. Given Agri-wallet's short history, it is **based primarily on projections, supplemented by a review of historical results, primary survey data and interviews with a sample of value chain participants and farmers**. In some areas, assumptions are more conservative than the aspirations above, in order to test the model and identify opportunities
  - Over the 2019-2024 period, the Agri-wallet model (Kenya only) creates **projected annual impacts of ~€51m**, of which **farmers capture ~€49m or >95%, value chain partners capture ~€1m**, and **Agri-wallet captures ~€0.6m per year** on average. This is assuming that by 2024, **135k farmer overdrafts worth €22m are outstanding, with 660k farmers registered on the platform**

# **Executive summary:** Key opportunities & risks for Agri-wallet

### Opportunities and risks of the Agri-wallet platform model

- **There is a huge opportunity to tap into latent demand for financing, and Agri-wallet's digital solution offers the potential for significant value creation across a wide range of value chains (although some are more challenging than others).** All customers we interviewed show significant latent demand and ask for 'more of the same' (more credit) rather than operational or service improvements. The model requires multiple stakeholders to work well, so Agri-wallet works best initially in more structured value chains with 'stickier' relationships, but can also provide data and funding to improve less structured, more challenging value chains.
- **Achieving financial sustainability by 2023 relies on rapid continued scaling, with buyers as the key leverage point to expand, and access to capital as the key barrier.** To become profitable, the business needs to access further funding to unlock latent demand, successfully manage a developing field network, while holding defaults low. Buyers are the key leverage point given higher profitability per product and higher incentive & ability to sign up farmers and input providers – hence the importance of deploying Agri-wallet's technology platform and track record of impact to effectively target, on-board and account-manage buyers.
- **Pricing, and credit risk, are key risks that will require continued testing and iteration to manage.** The business faces upwards pricing pressure with higher capital costs, as well as credit repayment risk given the ease of access to Agri-wallet credit (no collateral). These will partially be mitigated by off-balance sheet funding opportunity covered in this case study; but to a large extent these require work from the business to test and iterate approaches to winning and managing relationships with buyers, farmers and input providers.

# **Executive summary:** Opportunities for the future

There are ways to increase the sustainability of Agri-wallet's model and expand the impact on farmers and value chain partners. In this case study, we have evaluated three opportunities to drive shared value:

1. **Buyer portfolio segmentation to drive sales, marketing & customer care:** Buyers are key to Agri-wallet's profitability and scaling ambitions, but have high variation in repayment behaviour and profitability. Splitting a sample of 17 current buyers into three groups, **the lowest-value third show a negative average lifetime value[1] of ~-€800** (including farmer and input provider revenue streams), compared to the medium-value third at €6k and **high-value segment at €15k**. There is opportunity for Agri-wallet to target more profitable segments and deprioritise the 38% of buyers in the lowest-value segment. If Agri-wallet were able to better segment and target the buyer portfolio, this could bring **incremental net income** (assuming new buyers reflect a mix similar to current high- and medium-value buyer segments). As the business scales, it should work to continue segmenting the buyer portfolio in terms of various factors e.g. crop mix, social vs. commercial, structure of buyer's buyer agreements, ability to produce / process throughout the year, etc.) and target buyer outreach and customer care on that basis.
2. **Seeking off-balance sheet funding:** Currently, Agri-wallet's funding has primarily been through grants and conventional on-balance-sheet funding. Shifting customer receivables to off-balance sheet vehicles that raise debt and equity could unlock higher scale and reduce the cost of funding. Other than the 'managed fund' structure modelled in the 'Agri-wallet performance' section, we have evaluated a range of SPV models that vary and require trade-offs in terms of overall capacity, liquidity, costs of capital, and exchange rate exposure. This analysis suggests that vs. the current on-balance-sheet funding model, shifting to an SPV model could lower the equity requirement and return on capital invested for Dodore Kenya, while **increasing overall equity returns to all investors by 20% over 2019-24, due to a more efficient allocation of risks among investors.**
3. **Developing and optimising pricing strategy:** Increased capital costs will put upward pressure on prices, which could challenge volume growth. Agri-wallet therefore has opportunity to develop and optimise its pricing strategy. Given projected benefits to VCPs, it appears likely that doubling interest rates (as in our base case) **might cause churn amongst buyers** who see more limited uplift than farmers and have more access to alternatives; there is more scope to increase prices on farmers (to 24% p.a), but Agri-wallet should ensure that expected farmer income benefits are borne out in larger trials. The business therefore faces a **trade-off between scale and pricing**; however, this trade-off is mostly favorable, as doubling prices is still cost-effective as long as less than 45% of customers leave due to the price increase. Further work is also required on whether the pricing structure itself should change (e.g. monthly / daily fee vs. interest rate, or additional fees).

1 The average buyer lifetime value is calculated using a 12 year horizon, considering average default and drop-off rates

# Reading guide

**SDM overview**

Agri-wallet's performance

VCP's performance

Farmer performance

Opportunity pathways

This section provides an introduction to Agri-wallet's service delivery model.

In this section you will:

- ✓ Get an overview of the flow of goods and services in the SDM
- ✓ Understand the goals of Agri-wallet
- ✓ Get an overview of Agri-wallet's achievements to date

# **Aspirations |** By 2024, Agri-wallet aspires to serve ~3.3m farmers annually with 2.3m farmer overdrafts and 3m buyer-to-farmer payments

**BY 2024 Agri-wallet AIMS TO PROVIDE:**

**3.3m** farmers*, **14k** buyers and **12k** input providers registered on the platform across **12 countries**

**2.3m** annual overdrafts for farmer inputs totaling **460m EUR**

**3m** payments facilitated from buyers to farmers

**Our modelling looks at Kenya profitability only (a subset of the figures above) in order to test the potential impact and sustainability within the current business model –** of the above figures, this is equivalent to ~800k farmers, ~3k buyers and ~3k input providers registered on the platform; ~0.5m annual overdrafts for farmer inputs totaling ~110m EUR; and ~0.7m payments facilitated from buyers to farmers

Agri-wallet aims to provide under-served farmers, buyers and input providers with trade and input credit, via its digital platform that 'earmarks' spend specifically for income-generating agricultural activities

*Kenya specific figures: ~800k farmers,~3k buyers and 2.8k input providers

# **Achievements to date |** In Kenya, Agri-wallet has reached 25,000 farmers and partnered with ~57 buyers and ~113 input providers

**IN 2019 Agri-wallet PROVIDED (in KENYA):**

**25k** farmers,
**57** buyers and
**113** input providers
registered on the
platform

**1.2k**
annual overdrafts
for farmer inputs

**5.7k** payments
facilitated from
buyers to farmers

*The figures above reflect Kenya only; Agri-wallet is also launching initial operations in Uganda and Rwanda*

* Based on figures shared at end of August 2019

# **Agri-wallet's vision** | Agri-wallet's business model and offerings aim to address the financing shortfall in agriculture

**Overall aims:**

Agri-wallet aims to provide under-served farmers, buyers and input providers with trade and input credit, via its digital platform that 'earmarks' spend specifically for income-generating agricultural activities

**Stakeholders served:**

**Buyers** — **Farmers** — **Input providers**

**Products:**

- **Buyers:**
  - *Overdrafts to pay farmers more quickly, easily and securely*
- **Farmers:**
  - *Overdrafts to buy inputs*
  - *Digital wallet savings product*
- **Input providers:**
  - *Overdrafts to buy inventory (future product)*

**Key elements of value-add:**

- Earmarking of funds **specifically for agricultural investments**
- **Digital** solution to drive ability to scale and draw on data generated
- Serving **inter-related, under-served stakeholders**
- (Future) **de-risking of funding model** to drive further growth

# **Agri-wallet's evolution** | Agri-wallet's business model is pivoting to a scaling phase, after lessons learned from previous phases

## Ideation
*2017 – May 2018*

- Minimum viable product developed in 2017, including the following elements:
  - **Digital supply chains** for a more predictable, sustainable credit product at a lower cost to serve – and potential for data to create further value
  - **Earmarking of credit** so overdrafts can only be spent on income generating agricultural activities (e.g. buyers paying farmers, farmers buying inputs)
  - **Simple, affordable mobile finance** for under-served actors in the supply chain

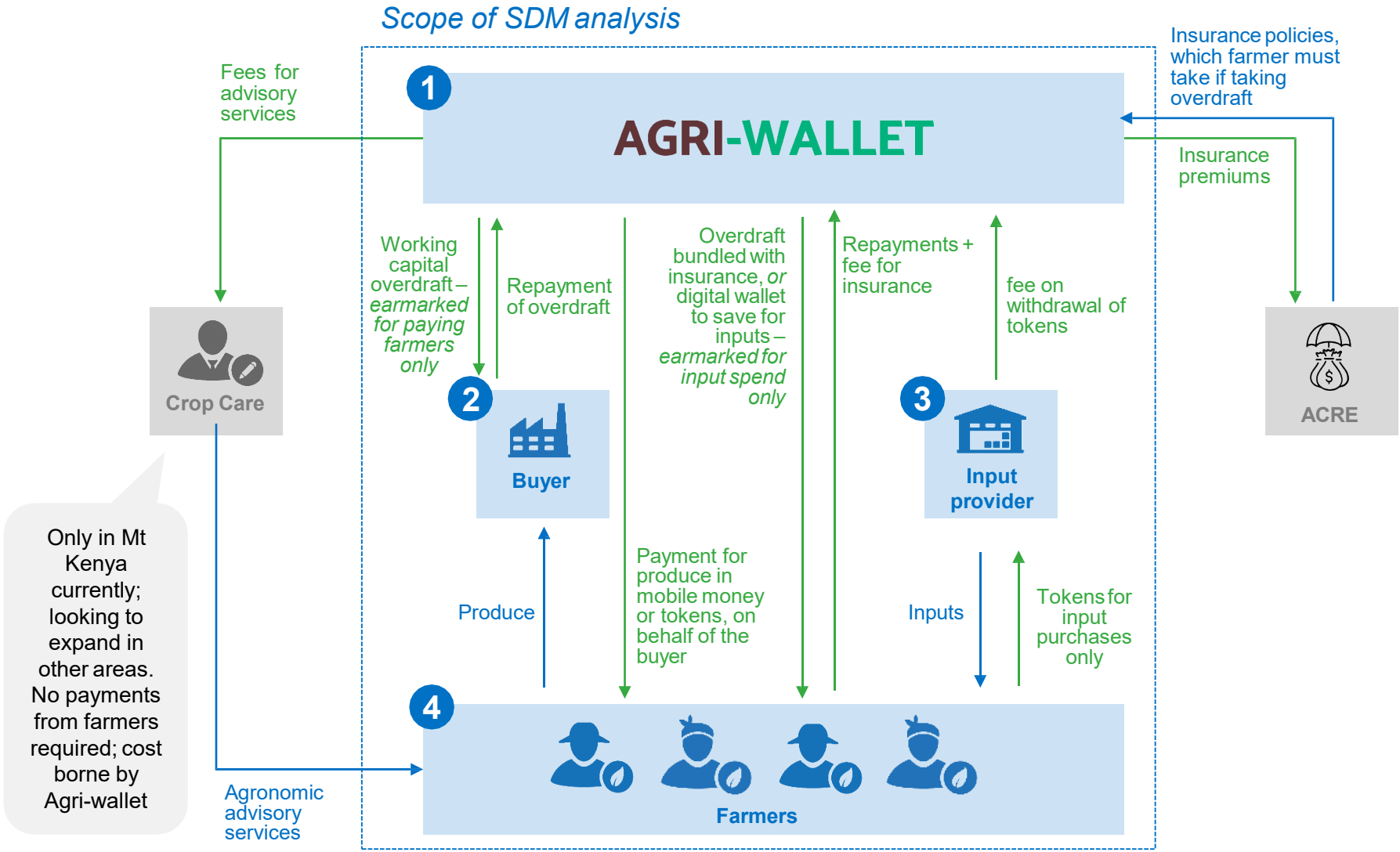
## Validation
*May 2018 - present*

- Mastercard Foundation grant, and on-lending funds from Rabobank to test the product
- **Key lessons learned** include:
  - **'Tighter' value chains with higher loyalty** are easier to Agri-wallet to operate in, given the **high risk of side-selling**…
  - …although there is opportunity for **data from Agri-wallet to improve less tight value chains**
  - **High benefits to stakeholders** given the network model, and high value of affordable, easy-to-access finance (as validated in this SDM report)

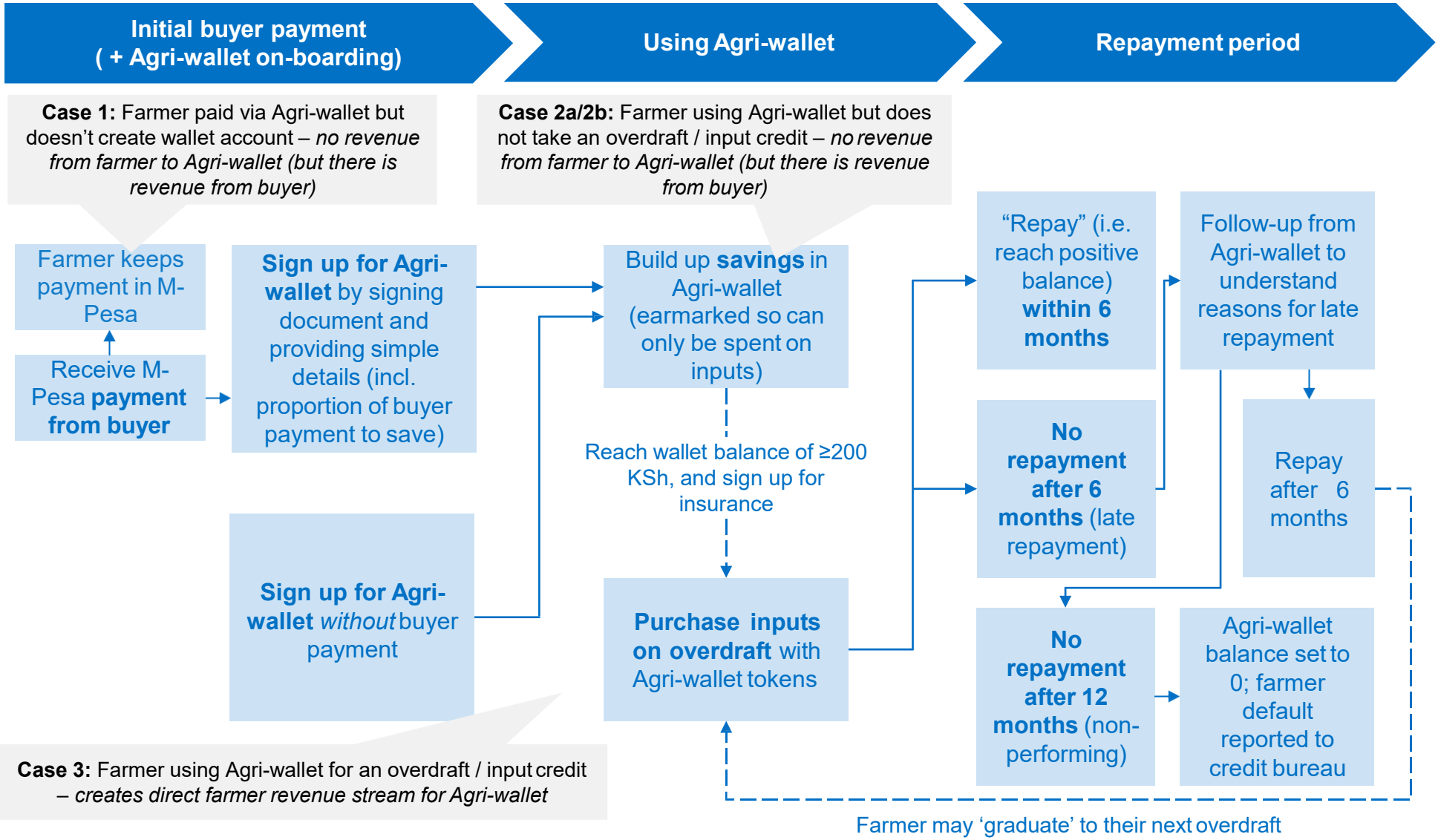
## Scaling
*2020 onwards*

- Agri-wallet is currently preparing to scale
- Underpinned by shift to **off-balance sheet funding** model *(with some outlines and modelling this report – although further arrangements are being determined)*

# **Service delivery model overview |** Through a digital wallet, Agri-wallet provides trade and input financing for under-served buyers & farmers



# **Farmer context** | Farmer customer journey



# **Farmer context** | Farmers can be addressed by the market linkage & transaction product, and/or the digital wallet product

| | Description of services | Expected farmer benefits | AW profit from farmers? |
|---|---|---|---|
| 1 **Non Agri-wallet Transaction Recipient** | • Registered on Platform<br>• Receives buyer transactions through M-PESA<br>• Does **not open an Agri-wallet** to save funds for inputs, or apply for an overdraft | **LOW** – Earlier buyer payments, which help with financial planning and costs | **NO** |
| 2A **Registered Agri-wallet Saver** | • Signs up for Agri-wallet by either committing a portion of buyer payments, or putting up a cash collateral<br>• Does **not purchase inputs** in a year | **LOW (currently)**<br>• Earlier buyer payments<br>• Improved savings capacity for future inputs (can only use tokens for inputs) | **NO** – but in future, will profit from input provider transaction fees |
| 2B **Active Agri-wallet Saver** | • Signs up for Agri-wallet by either committing a portion of buyer payments, or putting up a cash collateral<br>• **Purchases inputs** at least once a year | **MEDIUM**<br>• Earlier buyer payments<br>• Increased savings to purchase inputs, leading to higher yields | **INDIRECT** – indirect profits from input provider transaction fees only |
| 3 **Full Agri-wallet overdraft customer** | • Signs up for Agri-wallet by either committing a portion of buyer payments, or putting up a cash collateral<br>• Receives an **overdraft,** based on the size of the pay-in, crop type, etc.<br>• Uses the overdraft to **purchase inputs** from input providers at <once a year<br>• Repays balance within 12 months | **HIGH:**<br>• Benefits from earlier buyer payments<br>• Increased working capital funds to purchase higher volume / quality of inputs, leading to higher yields | **YES** – interest p.a. + overdraft fee during outbalance, and input provider transaction fee |

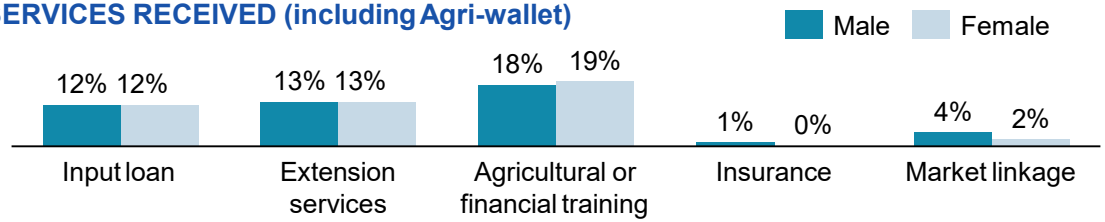
# **Farmer Primary Data** | The average Agri-wallet farmer (regardless of product used) grows multiple crops and has limited access to services

**AGE** 46

**EDUCATION** Primary school completed

**LOCATION** Keringet, Kenya

## SERVICES RECEIVED (including Agri-wallet)




## FARM

- **Ownership:** Owns land
- **Farm size:** 3.65 acres (of which potatoes: 1.25 acres / 35% of land)
- **Other crops:** Grows diversified crops, mainly maize, beans, peas, cabbage.
- **Animals:** Owes an average of 3 cows for milk, and some other animals (chickens, goats).

## FINANCIAL & DIGITAL BEHAVIOUR

- **Phone**: 90% have a basic phone, of which 40% have a smart phone.
- **Mobile money:** 80% have Mobile Money
- **Bank account:** 60% have a bank account
- **overdraft:** 35% borrow money in cash or MM

## FARM ACTIVITY

- **Equipment:** Uses land preparation tools (30% animal traction, 35% tractors), tools for weeding (75%) and pesticide spraying (45%)
- **Inputs:** Primarily seeds, fertiliser and pesticide. Low use of other agrochemicals.
- **Labor:** Some casual labour support, primarily for land preparation and planning. Limited support in harvesting and post-harvesting.

## POTATO PRODUCTION (example)

- **Seasons:** Two seasons per year
- **Production:** Producing around 2300 KGs per 1.3 ages, each season. 75% of product sold.
- **Losses**: 5% of total production
- **Own consumption:** 20% of total production
- **Sales:** average of 18 KSh/kg

## MULTIPLE REVENUE SOURCES

| Source | KSh |
|---|---|
| Potatoes | 75,000 |
| Dairy | 95,000 |
| Other crops | 40,000 |
| Non-agri | 80,000 |
| **TOTAL** | **290,000** |

## CLIMATE RESILIENCE

- **Risks:** Changing rain patterns, cold waves (incl. frost) and droughts are the most commonly faced.
- **Mitigation:** ~50% of farmers have mitigation measures, primarily drawing on savings (usually in mobile money accounts) and good agricultural practices.

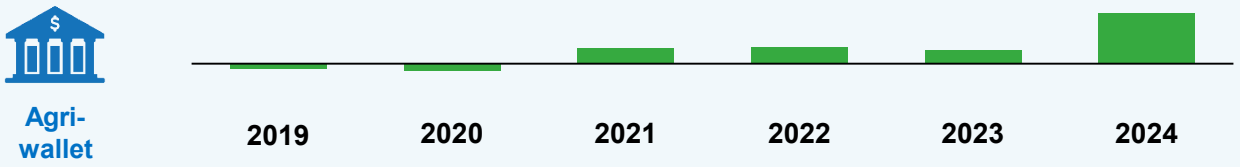
**Implications for Agri-wallet**

- Few farmers currently receive services, creating significant need for these. Men and women have similar uptake of services.
- Most farmers are mix-value chain farmers, and hence will see uplift benefits from improved inputs across multiple crops. Agri-wallet could partner with buyers across several value chains to full digitize farmer's payments.
- The vast majority of farmers have phones and mobile money accounts, and hence can easily use the Agri-wallet service. Limited smartphone ownership means an SMS-based service is the best solution.

# **Agri-wallet value creation |** Through these partnerships, Agri-wallet creates significant value across the ecosystem every year

Without subsidy, Agri-wallet will break even in 2022 rather than 2021

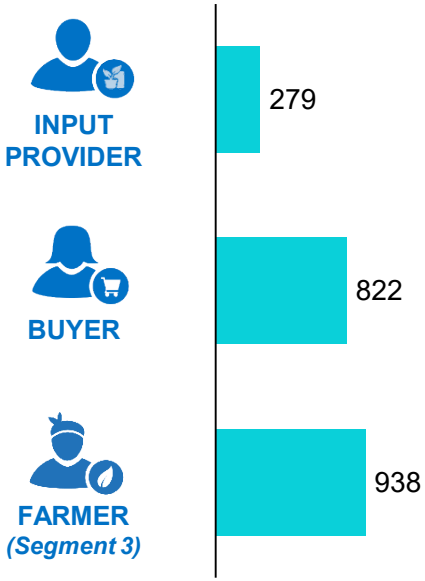
***Agri-wallet 'system' pre-tax net income by year[1]***




*Average net income*

***Over time as Agri-wallet moves towards a positive business model, in the wider ecosystem Agri-wallet creates:***

*Per player, an annual average of…*




*…additional EUR net income*

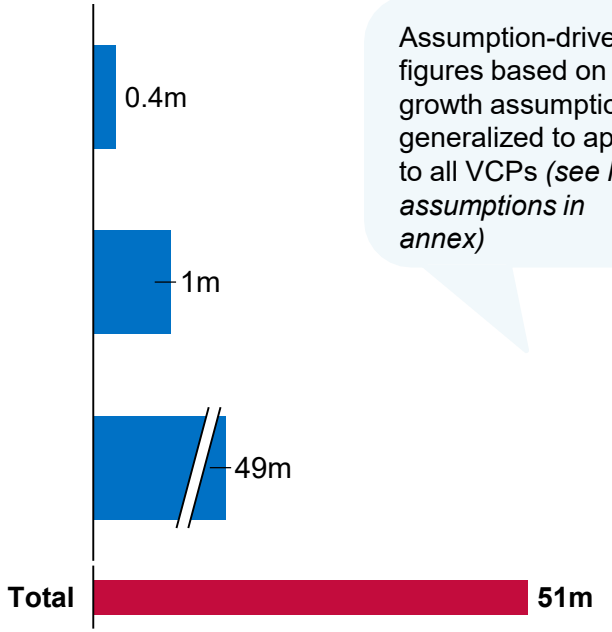
*For an annual average of…*

**1,183** input providers[2]

**853** buyers[3]

**50,419** farmers

*Contributing to average annual value creation of…*




*…EUR as a result of Agri-wallet*

Assumption-driven figures based on growth assumptions generalized to apply to all VCPs *(see list of assumptions in annex)*

1. *Reflects 'system' profit equivalent to on-balance sheet funding at the same scale (as the managed blended finance facility model that Agri-wallet plans to pursue)*
2. *Each individual store providing inputs counted as a single input provider i.e. a network of stores like Syngenta would have individual stores counted*
3. *Each buyer counted as an entity taking up to 1 overdraft at a time from Agri-wallet*

# Reading guide

SDM overview

**Agri-wallet's performance**

VCP's performance

Farmer performance

Opportunity pathways

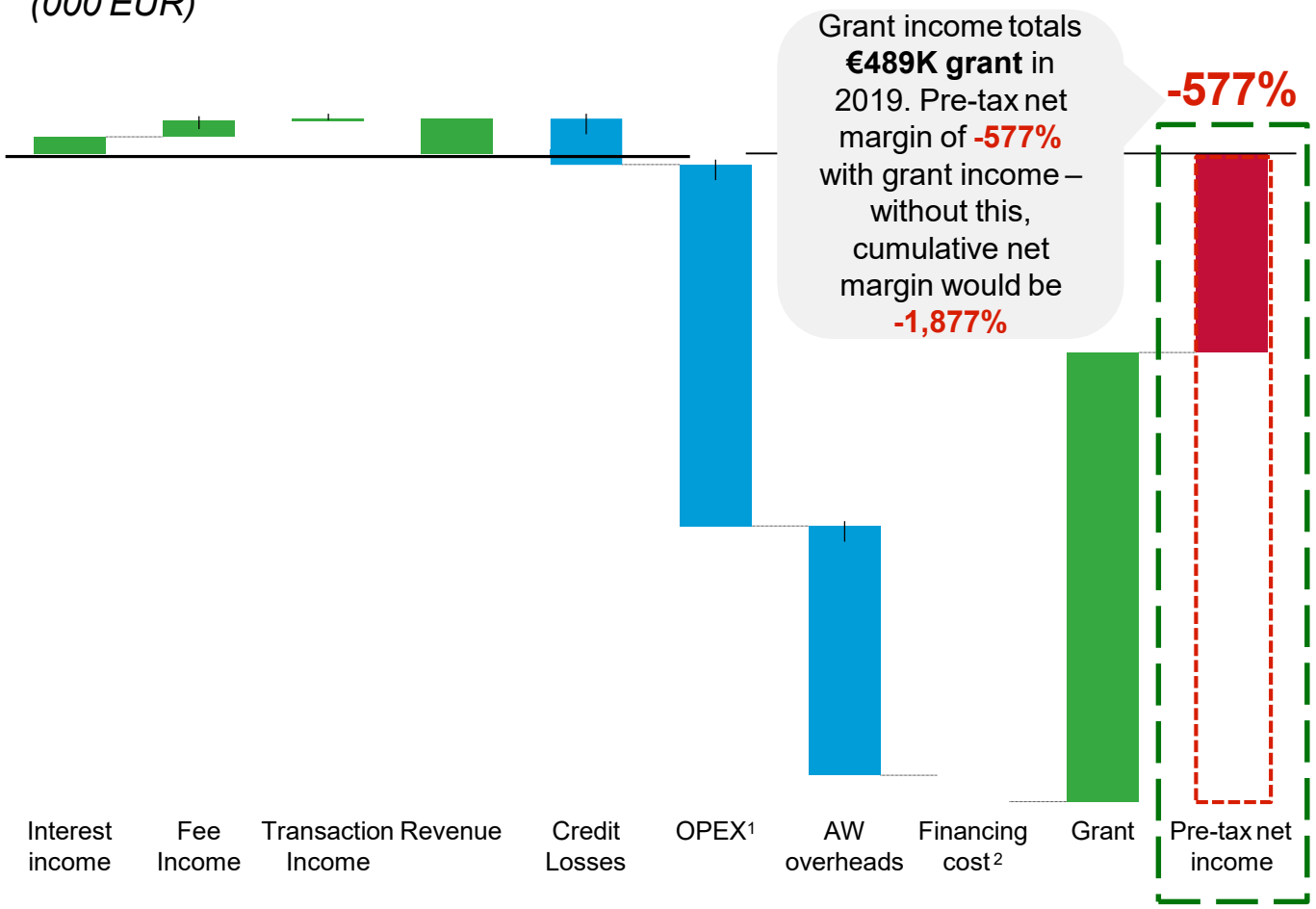
This section presents the findings of the financial analysis of Agri-wallet.

In this section you will:

- ✓ Understand the financial performance of Agri-wallet
- ✓ Get a deep insight into the revenue and cost drivers of Agri-wallet's products
- ✓ Understand the value Agri-wallet is getting out of its customers over its lifetime

# **Agri-wallet's Performance** | Under its current funding structure, Agri-wallet has a projected net margin of -577% for 2019

**Agri-wallet net income, January 2019 - December 2019**
*(000 EUR)*




1. *Credit OPEX includes all direct costs for the FY 2019 including costs associated with field staff*
2. *Financing cost includes the cost of debt and currency loss for the overdraft services*

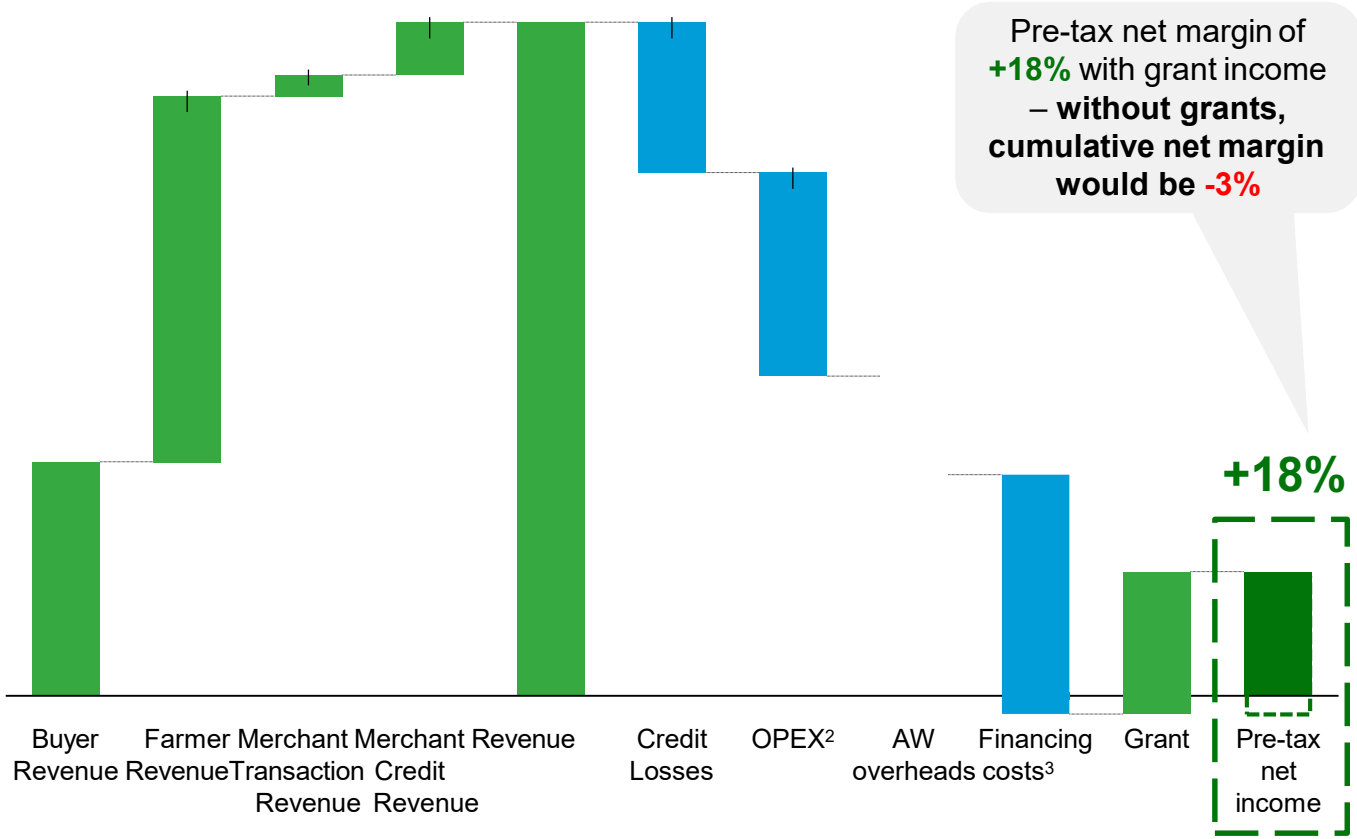
**Key revenue & cost drivers**

- Under current funding, Agri-wallet has not yet reached sufficient scale to fully cover its costs, with funding primarily via grants (Rabobank funding to end this year)
- High direct costs of on-boarding and serving customers (e.g. field staff, agents) are the major driver of losses this year
- **Overheads** are also a major cost line, as the business is investing for future growth but scale remains small

***Click to go to assumptions***

# **Agri-wallet Performance |** ‘System’ profits (i.e. including investor returns) show net margin of +18% over 2019-24

**Agri-wallet cumulative net income, January 2019 - December 2024[1]**
*(000 EUR)*




**Key revenue & cost drivers**

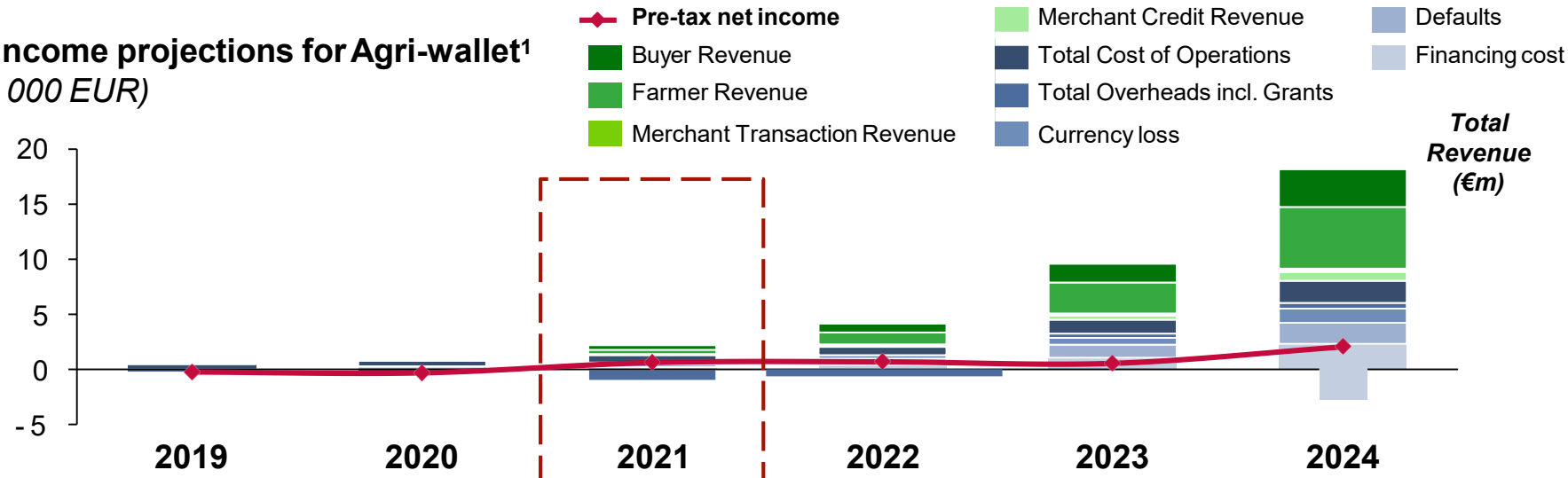
- ‘System’ profits shown are equivalent to a scenario with conventional on-balance sheet funding at **9% cost of debt**, assuming the same scale is achievable as with off-balance sheet funding
- **Scale** is a key requirement for this level of profitability
- **Opex costs** scale with farmer numbers (agents etc.)
- **Financing costs** are a major cost but in practice (i.e. with off-balance sheet funding) would be distributed across investors *(see following slides)*
- **Overheads** will become a lower proportion of the cost base as the business gains operating leverage

1. *Reflects ‘system’ profitability i.e. overall financial structure for Dodore Kenya and SPV investors; see later slides for Dodore Kenya implications*
2. *OpEx includes all direct costs for the FY 2019-FY2024 including costs associated with field staff*
3. *Financing cost includes the cost of debt and expected currency losses on overdraft services*

***Go to assumptions***

# **Agri-wallet Performance |** In these projections, the Agri-wallet "system" breaks even with grants in 2021 and without grants in 2022

**Net income projections for Agri-wallet[1]**
*(000 000 EUR)*




| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| **Pre-tax profit margin** | -456% | -119% | 70% | 33% | 11% | 20% |
| **Grant income** | | | | | | |
| **New equity needed** | | | | | | |
| **# buyers registered** | 141 | 338 | 619 | 979 | 1,775 | 3,138 |
| **% buyers taking AW overdraft** | 40% | 40% | 40% | 40% | 50% | 60% |
| **# farmers registered** | 11k | 27k | 57k | 102k | 206k | 402k |
| **% farmers taking AW overdraft** | 15% | 15% | 15% | 18% | 23% | 28% |
| **# input providers registered** | 90 | 205 | 410 | 694 | 1332 | 2487 |
| **% input providers taking AW overdraft** | 30% | 30% | 40% | 40% | 50% | 60% |

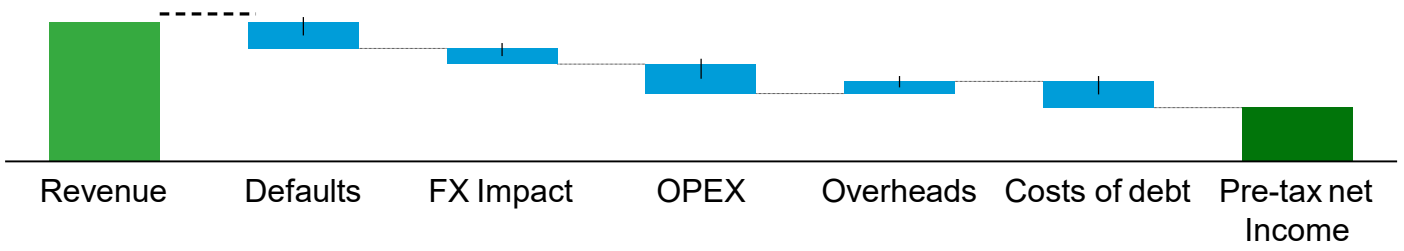
*1. Reflects 'system' profitability i.e. overall financial structure for Dodore Kenya and SPV investors; see later slides for Dodore Kenya implications*

# **Agri-wallet Performance |** The buyer credit product has a 2019-2024 net margin of 39%, while farmer credit's net margin is 6%

Go to assumptions

## Buyer Credit[1]

**Agri-wallet cumulative net income, 2019 - 2024** *(000 000 EUR)*

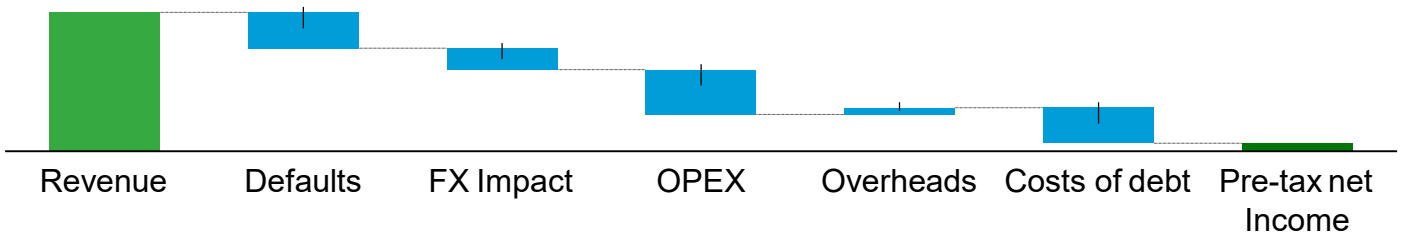



Net Margin (Current Fin. Structure): **+39%**
Net Margin (without grants): **+13%**
Return on invested capital: **+69%**

Higher margins vs. other credit products due to higher pricing (assumed to increase to 36% p.a. by 2021, from 18% today[2]), and OpEx focused mainly around on-boarding

## Farmer Credit[1]

**Agri-wallet cumulative net income, 2019 - 2024** (*000 000 EUR*)




Net Margin (Current Fin. Structure): **+6%**
Net Margin (without grants): **-13%**
Return on invested capital: **+10%**

Lower margins vs. buyer credit, given lower pricing and higher allocation of OpEx due to field staff and agent time required to on-board and serve farmers

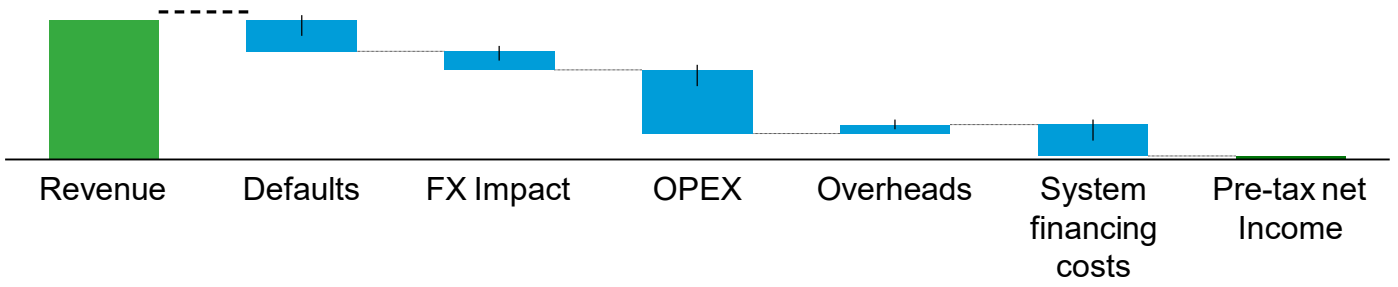
*1. Reflects 'system' profitability i.e. overall financial structure for Dodore Kenya and SPV investors; see later slides for Dodore Kenya implications*
*2. Assumption likely to be subject to revision in internal Agri-wallet planning, given potential scope to further increase prices (further testing TBC)*

# **Agri-wallet Performance |** Input provider credit functions as a loss-leader with 2% cumulative net margin, but transaction net margin is 52%

Go to assumptions

## Input Provider Credit[1]

**Agri-wallet cumulative net income, 2019 - 2024** *(000 000 EUR)*



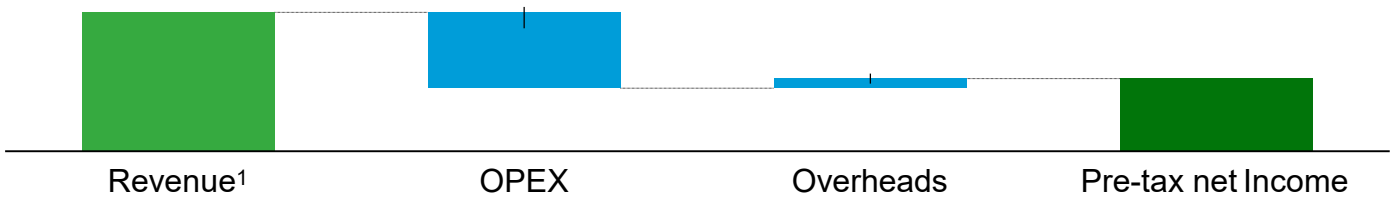

Net Margin (Current Fin. Structure): **+2%**
Net Margin (without grants): **-20%**
Return on invested capital: **+2%**

*Planned product – not yet provided*

Lowest margins vs. other credit given limited scale assumed for new product with relatively fragmented customer base

## Input Provider Transaction[1]

**Agri-wallet cumulative net income, 2019 - 2024** (*000 000 EUR*)




Net Margin (Current Fin. Structure): **+52%**
Net Margin (without grants): **+17%**
Return on invested capital: **+29%**

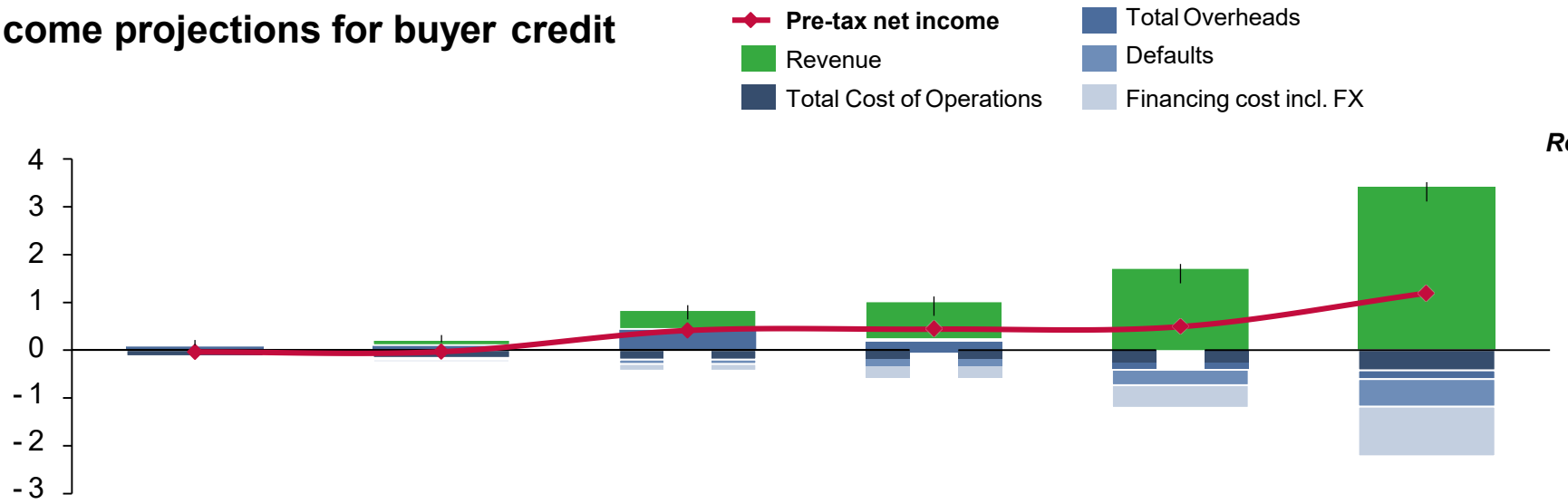
High margins, even without grant funding, as transaction costs are earned as a function of farmers spending at registered input providers, and B/S usage is minimal

*1. Reflects 'system' profitability i.e. overall financial structure for Dodore Kenya and SPV investors; see later slides for Dodore Kenya implications*

# **Buyer credit deep dive |** Buyer credit is becomes sustainable relatively quickly, largely due to high prices vs. other products

## Net Income projections for buyer credit

*(€m)*




| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| # buyers registered | 141 | 338 | 619 | 979 | 1775 | 3138 |
| % buyers taking AW overdraft | 40% | 40% | 40% | 40% | 50% | 60% |
| Avg. probability of default[2] | 6.5% | 6.0% | 5.5% | 5.0% | 4.8% | 4.3% |

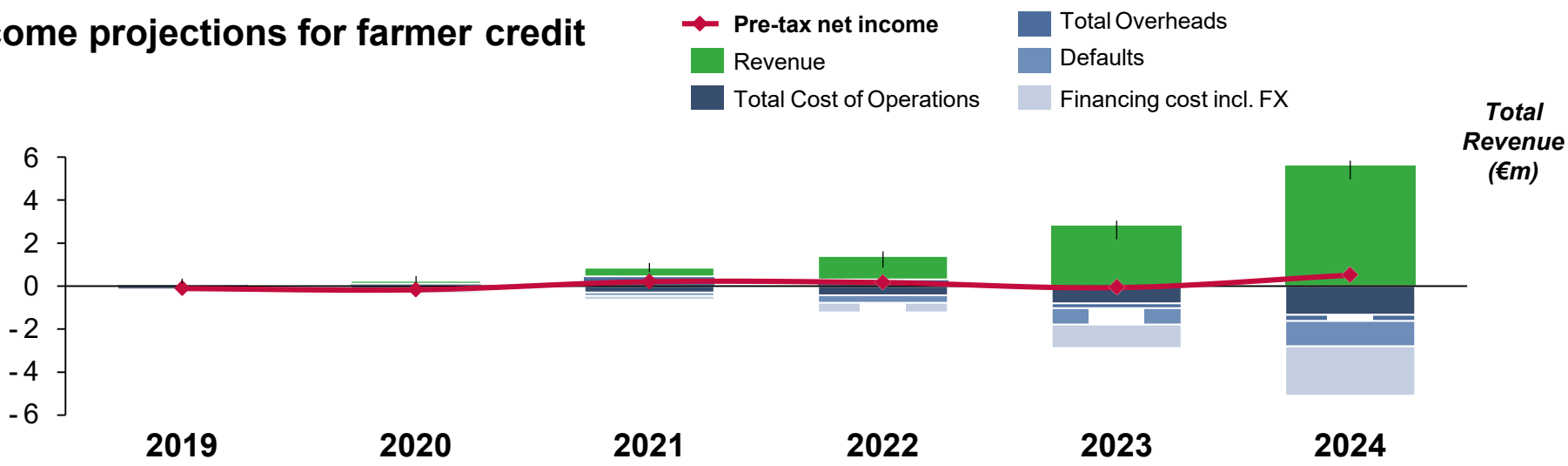
Go to assumptions

*1. Assumption likely to be subject to revision in internal Agri-wallet planning, given potential scope to further increase prices (further testing TBC).*
*2. Based on individual probability of default at time of overdraft being disbursed. Equivalent to NPL rate declining to <1% by 2024*

# **Farmer credit deep dive |** Farmer credit is challenging to make sustainable given high variable costs (e.g. agents & field staff)

## Net Income projections for farmer credit

*(€m)*



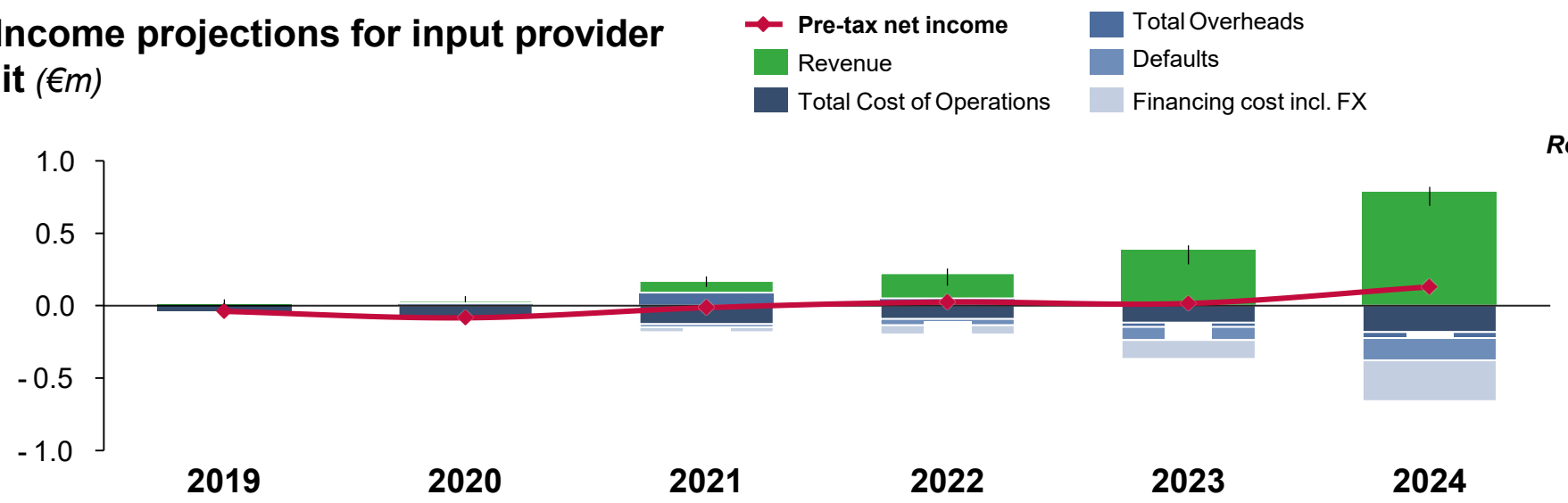

| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| # farmers registered | 11k | 27k | 57k | 102k | 206k | 402k |
| % farmers taking AW overdraft | 15% | 15% | 15% | 18% | 23% | 28% |
| Avg. probability of default[2] | 29% | 20% | 10% | 8% | 7% | 6% |
| Farmers per field officer | 10k | 10k | 10k | 10k | 10k | 10k |
| Farmers per call centre agent | 10k | 10k | 10k | 10k | 10k | 10k |

*1. Assumption likely to be subject to revision in internal Agri-wallet planning, given potential scope to further increase prices (further testing TBC).*
*2. Based on individual probability of default at time of overdraft being disbursed. Equivalent to NPL rate declining to <1% by 2024*

Go to assumptions

# **Input provider credit deep dive |** Input provider credit is a new product that Agri-wallet plans to roll out; in our projections breaking even by 2022

## Net Income projections for input provider credit *(€m)*



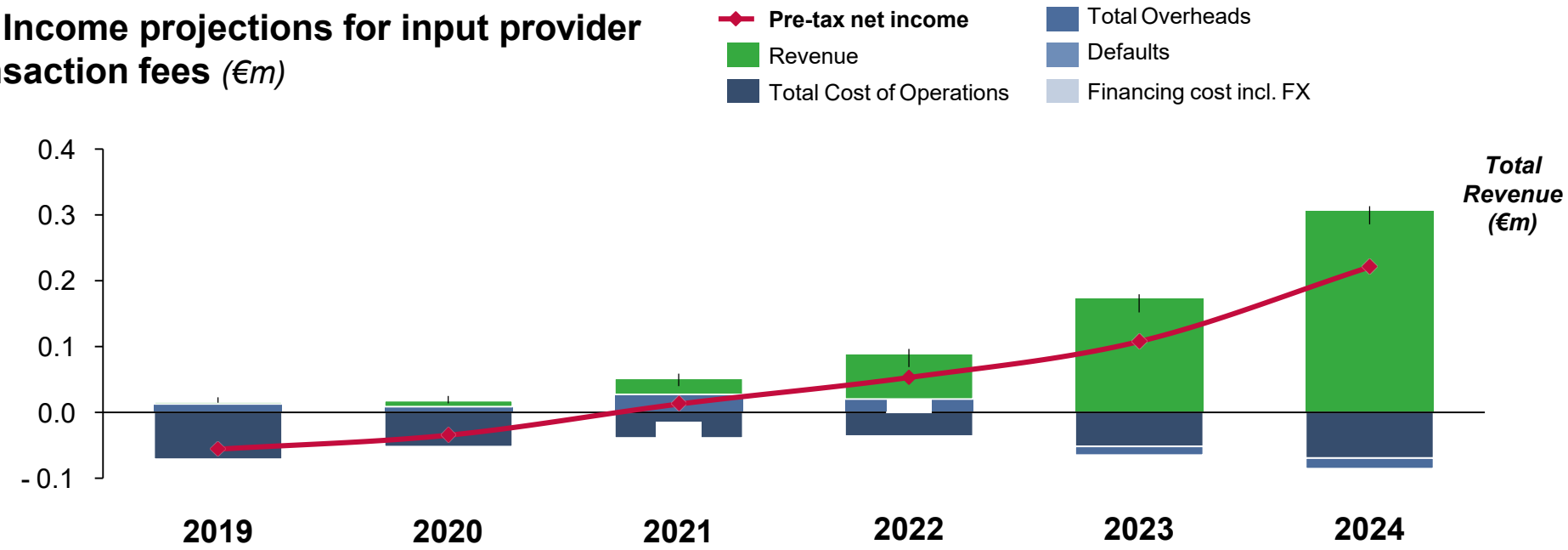

| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| **# input providers registered** | 90 | 205 | 410 | 694 | 1332 | 2487 |
| **% input providers taking AW overdraft** | 30% | 30% | 40% | 40% | 50% | 60% |
| **Avg. probability of default[2]** | 6.5% | 6.0% | 5.5% | 5.0% | 4.8% | 4.3% |

Go to assumptions

*1. Assumption likely to be subject to revision in internal Agri-wallet planning, given potential scope to further increase prices (further testing TBC).*
*2. Based on individual probability of default at time of overdraft being disbursed. Equivalent to NPL rate declining to <1% by 2024*

# **Input provider transaction deep dive |** Transaction fees make up a low share of revenue but are relatively profitable, driven by farmer overdrafts

## Net Income projections for input provider transaction fees *(€m)*




Farmer overdrafts are disbursed when they buy inputs, so this is the base on which input provider transaction fees are charged (alongside farmers saving without taking an overdraft forming around ~10% of the Agri-wallet spend of overdraft farmers)

| | | | | | | |
|---|---|---|---|---|---|---|
| **Total farmer overdrafts disbursed (€)** | €0.2m | €0.8m | €2.2m | €6.3m | €15.7m | €27.8m |

Go to assumptions

*1. Assumption likely to be subject to revision in internal Agri-wallet planning, given potential scope to further increase prices (further testing TBC).*
*2. Based on individual probability of default at time of overdraft being disbursed. Equivalent to NPL rate declining to <1% by 2024*

# Agri-wallet Performance | Sensitivity analysis

The table below shows **what change to each key variable would yield a €$1.0M cumulative pre-tax net income gain** over the same period

| | Variable | Baseline assumption | Required assumption for +€1M cumulative net income 2019-2024 |
|---|---|---|---|
| Buyers | # buyers registered | 4.7k by 2024 | **+700** by 2024 |
| | Buyer probability of default[2] | 4.6% avg. | **-3.4** pts avg. |
| Farmers | % registered farmers who take overdraft | 21% avg. 2019-24 | **+7** pts avg. 2019-24 |
| | Farmer probability of default[1] | 7.0% avg. | **-2.4** pts avg. |
| Input providers | # input providers registered | 3.9k by 2024 | **+6.5k** by 2024 |
| | Input providers probability of default[2] | 4.6% avg. | *Not possible* |
| | Input provider transaction fee | 1% | **+1.8** pts |
| Others | FX loss | -7% p. a. | **-3.0** pts p. a. |
| | Field & call centre staff: 1 FTE per… | 10k farmers | **+18k** farmers |
| | Cost of debt | 9% | **-3.0** pts |
| | | | *"pts" = percentage points* |

1. *Increasing first overdraft size also has impact (of same proportion) on further overdrafts, which are assumed to grow as a fixed % vs. previous overdraft*
2. *Probability of default for an individual farmer/buyer at the point of overdraft disbursement. For farmers, due to cohort effects, this is equivalent to non-performing overdraft rates (based on portfolio value) of <1% over the years modelled (vs. portfolio-level current non-performing farmer overdraft rate of 2.1%)*
3. *Assumed that interest rates double by 2021 vs. current rates (18% p.a. for buyers, 12% p.a. for farmers, with input provider credit assumed aligned to buyers)*

# **Agri-wallet Performance |** A few drivers related to volume and pricing stand out as key levers to investigate further

Based on the sensitivity analysis *(detailed on the previous pages)*, **key drivers of uplift** include increasing overdraft size for buyers, increasing interest rates (particularly for farmers & buyers) / transaction fees (for input providers), and increasing the proportion of registered farmers who take overdrafts. *See opportunities section for more detail on buyer segmentation and pricing opportunities*

| | Variable | Required assumption for +€1M cumulative net income 2019-2024 | Commentary on improving lever |
|---|---|---|---|
| **Buyers** | **Buyer first overdraft size**[1] | **+80k** KSh | • Relatively modest increases required to drive substantial net income uplift<br>• Option to increase later overdrafts rather than first overdrafts, which may be better to assess customer risk (given lack of collateral requirement) |
| **Farmers** | **% registered farmers who take overdraft** | **+7** percentage points avg. 2019-24 | • Increasing the proportion of registered farmers who take an overdraft is a key net income lever, especially as registering farmers incurs agent commissions but only drives direct revenue if an overdraft is taken<br>• Primary barrier to increasing this is overall capital constraint for Agri-wallet |
| | **Farmer interest rate**[2] | **+4** percentage points by 2021 | • There may be further room to do so given substantial value-add for farmers using Agri-wallet *(see Farmer Performance section)*. |
| **Input providers** | **Input provider transaction fee** | **+1.8** percentage points | • Only modest increases of transaction fee is required to substantially increase profit; 1.8 pts is only a small share of the 10-20% gross margin that input providers earn<br>• However, risk that this may be passed on to farmers with limited ability of Agri-wallet to control this; some input providers that already do this |

*1. Increasing first overdraft size also has impact (of same proportion) on further overdrafts, which are assumed to grow as a fixed % vs. previous overdraft*
*2. Assumed that interest rates double by 2021*

# Agri-wallet Performance | Upside and downside scenarios

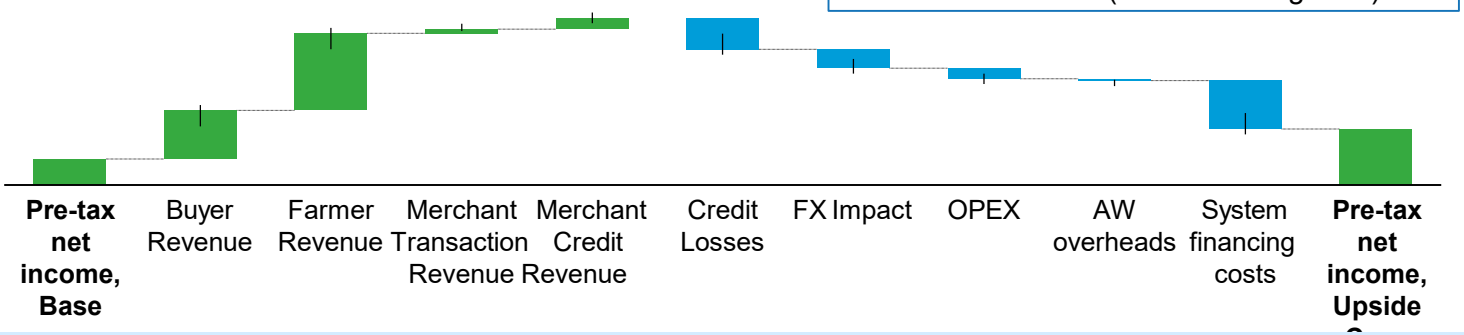
## Kenya upside case – *2x growth in Kenya, and no changes to cost base*

**Assumptions:**

- Twice as much scale as assumed in the base case (shown on previous pages), e.g. farmer conversion reaches 30% by end of 2024 rather than 15%

**Agri-wallet cumulative net income, 2019 - 2024** *(000 000 EUR)*

Net Margin (with projected grants): **+26%**
(**+16%** without grants)
Break even in 2021 (2022 without grants)



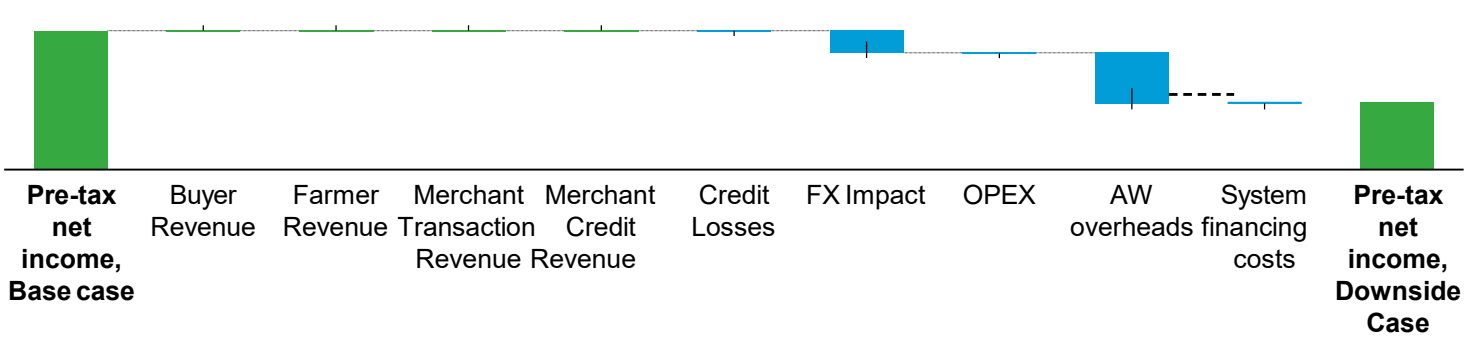

## Kenya downside case – *No cost benefits from international expansion*

**Assumptions:**

- Same scale in Kenya as in the base case
- Agri-wallet does not expand beyond Kenya, and so loses benefits from diversifying currencies and spreading overheads (in particular central HQ costs)

**Agri-wallet cumulative net income, 2019 - 2024** *(000 000 EUR)*

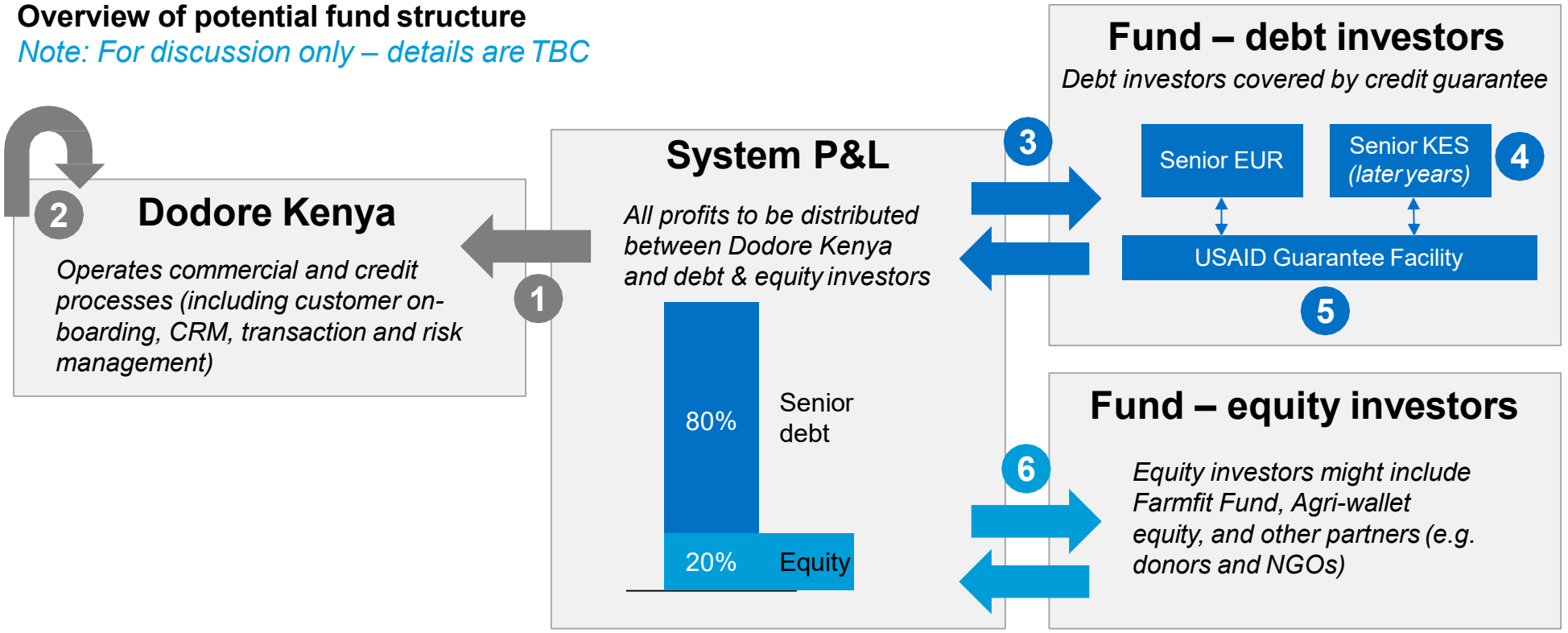
Net Margin (with projected grants): **+9%**
(**-74%** without grants)
Break even in 2021 (2023 without grants)



# **Agri-wallet Performance** | Agri-wallet plans to transition to a managed fund structure (with details TBC)

**Overview of potential fund structure**

*Note: For discussion only – details are TBC*




1. Dodore Kenya receives **management fees** (in this example, 11% of fund assets) & **performance fees** (TBC)
2. Dodore Kenya pays all **opex & overhead costs of** operating the business
3. Senior lenders receive **interest rates** lower vs. on-balance sheet rates due to USAID guarantee and funding model
4. In later years, some **KES debt** is raised to offset FX risks
5. 50% of senior debt is covered by **credit guarantee** (on a pari passu basis, in exchange for nominal fee)
6. **Equity investors** receive all remaining revenue after management fees, performance fees (if any) credit and FX losses

# **Agri-wallet Performance |** In the planned structure, revenues, risk and expenses would be allocated more efficiently, raising total returns

**Allocation of P&L, 2019-24 cumulative**
*Note: For discussion only – details are TBC*

Distribution of returns is highly dependent on management & performance-based fees agreed between Dodore Kenya & investors

## Dodore Kenya

| | |
|---|---|
| Management fee | |
| Performance fee | |
| **Revenues** | |
| Opex & overheads (incl. grants) | |
| **Profit** | |
| *ROIC* | *>100%* |

## System P&L

| | |
|---|---|
| **Revenues** | |
| Opex | |
| Overheads | |
| Grants | |
| Potential FX impact (if all EUR) | |
| Credit losses | |
| **Total cost** | |
| **Available earnings** | |

## Fund – debt investors

| | |
|---|---|
| Interest at 6% - EUR | |
| Interest at 13% - KES | |
| Residual credit risk over 20% loss | |
| **Net return** | |
| *Net return* | *~7%* |

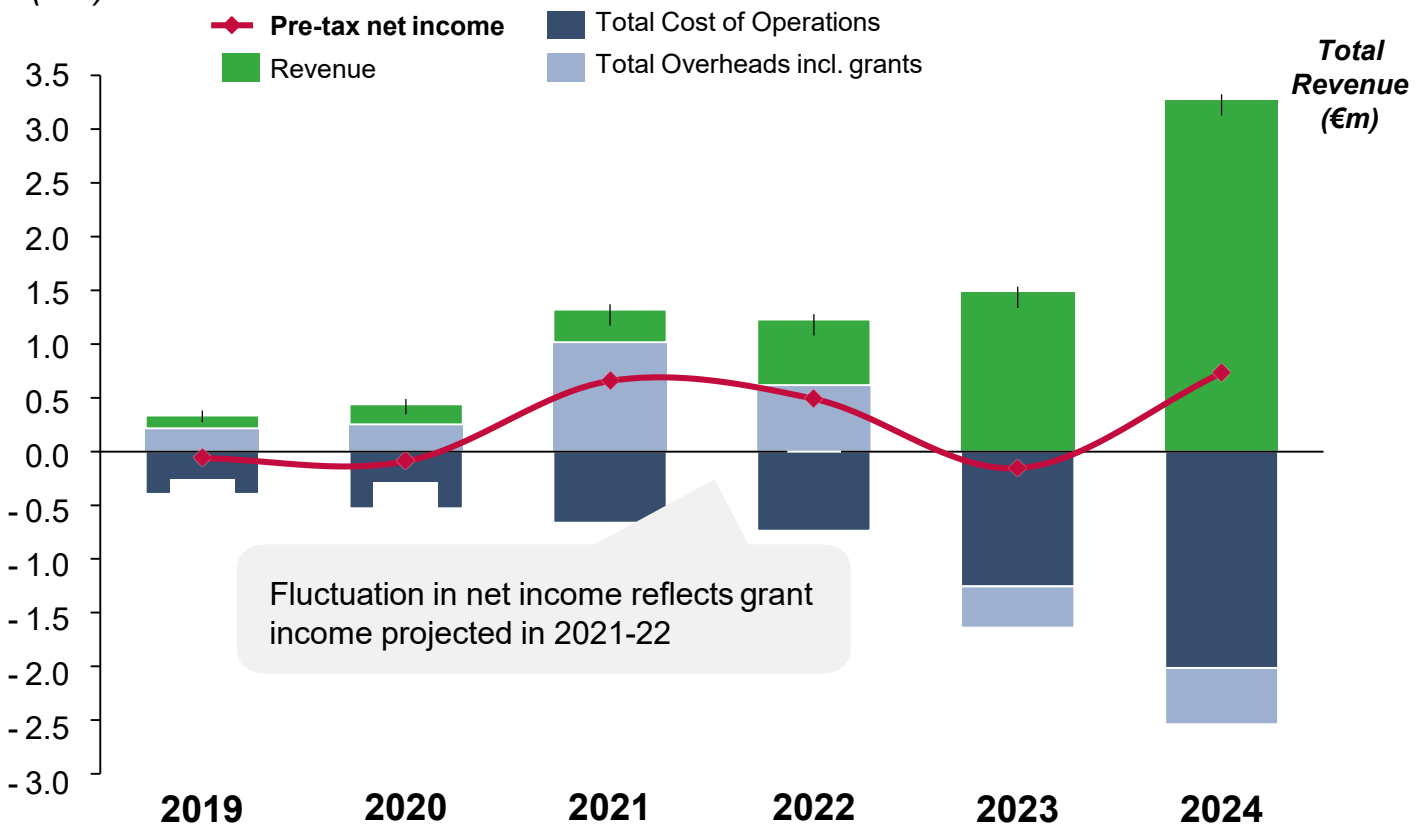
## Fund – equity investors

| | |
|---|---|
| Revenue after mgmt. fee & coupon | |
| FX Impact (incl. ramp-up of LCY funding) | |
| Credit losses | |
| **Gross return** | |
| Performance fee | |
| Fund audit & credit guarantee fee | |
| **Net return** | |
| *IRR* | *~25-30%* |

# **Agri-wallet Performance |** In this model, Dodore Kenya, acting as servicer, earns less net income vs base, but has lower risk

## Net Income projections for Dodore Kenya

*(€m)*




**Key drivers**

- **Revenues** for Dodore Kenya consist of the management fee and performance-based fee paid by investors
- **Only opex and overheads** are borne by Dodore Kenya; credit and FX risk is attributed to equity investors

**Financial profile**

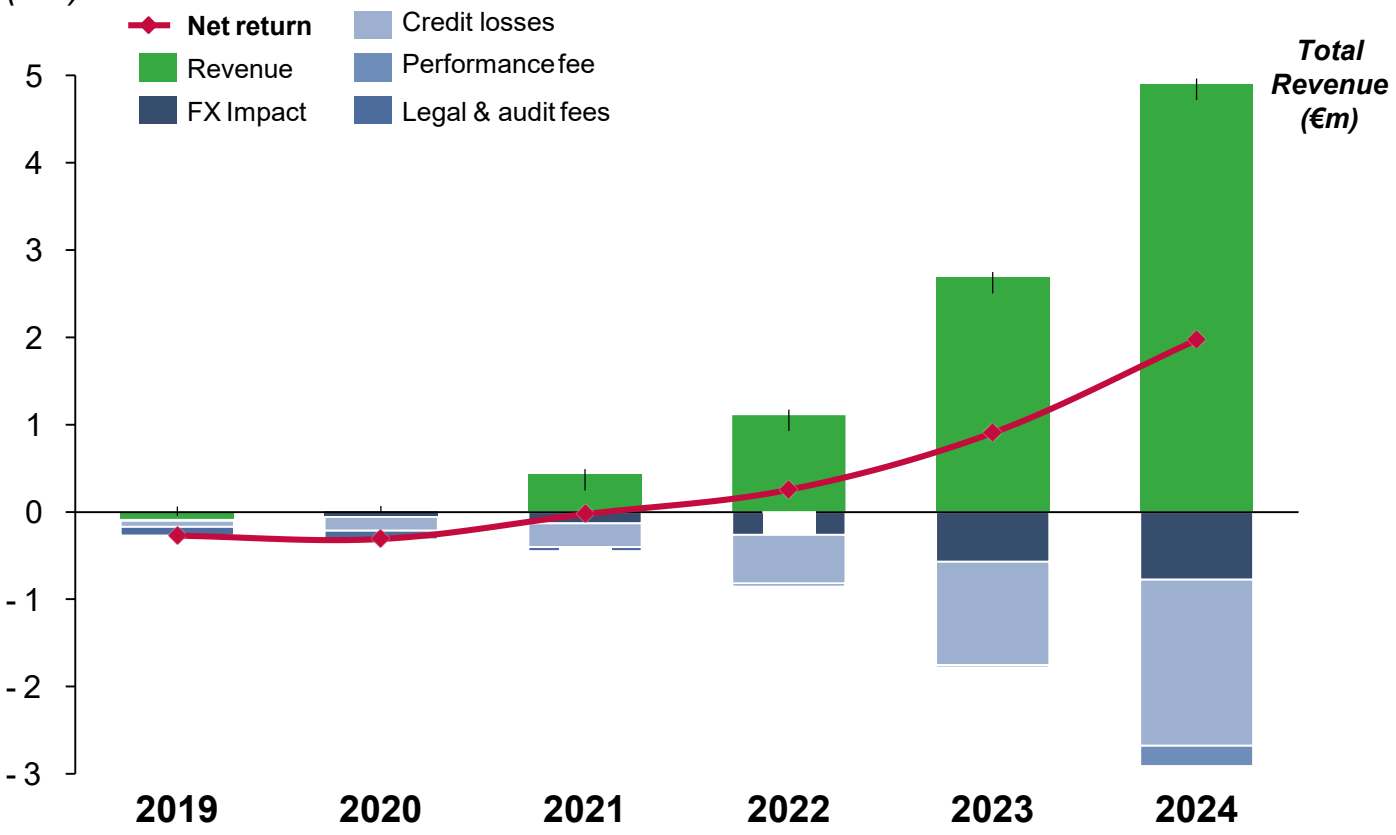
- Dodore Kenya breaks even in 2021 with grants, and in 2024 without grants
- This break-even is highly dependent on the level of management fee agreed with fund equity investors

*1. Assumption likely to be subject to revision in internal Agri-wallet planning, given potential scope to further increase prices (further testing TBC).*
*2. Based on individual probability of default at time of overdraft being disbursed. Equivalent to NPL rate declining to <1% by 2024*

# **Agri-wallet Performance** | Equity investors in the prospective fund absorb the financial risks and are compensated by a higher return

## Net Income projections for equity investors

*(€m)*




**Key drivers**

- **Revenues** for equity investors consist of customer revenues, with the management fee and interest payments deducted
- Key costs include **credit loss** and **FX costs**, which are taken on by equity investors
  - Assumed that funding in KES ramps up to 50% by 2024 – however, most of the expected benefits from reduced currency risk is offset by higher assumed interest rates (~14% vs. ~6% for EUR[1])

*1. Interest rates here assumed to be 1-2%pts lower than market rates given assumption that credit guarantee covers 50% of senior debt*

# **Agri-wallet Performance |** Key design considerations, and risks to mitigate, for a managed fund model

## Implementation path

- **The distribution of profit and revenue risk between Dodore Kenya and investors is highly dependent on future agreements on fee structure**
  - Industry standard is typically for fixed fees in initial years *or* fees based on committed rather than deployed capital – to ensure the operator covers fixed costs, balanced with investor risk appetite
- **The fund's cost of debt and leverage ratio demanded by investors is unknown until presented to market**
  - Securing a credit guarantee can help and should make this debt fairly attractive given Eurozone rates
  - However, there is a trade-off between the size of the equity tranche taken by Agri-wallet and investors, vs. rates that investors might accept
- **Agri-wallet may consider a phased approach before moving to a full 'managed fund' structure** e.g. setting up an SPV that just issues debt, or funding the Agri-wallet fund entity (as distinct from Dodore as operator) with a line of credit or slightly more flexible debt at first

## Key trade-offs & risks

- **There is a risk of lower than expected scale being achieved, given unfamiliarity to potential investors**
  - Some precedents exist for debt fund models (e.g. 6-24 month working capital overdrafts to cooperatives and agri-SMEs, $100k+ ticket size)
  - However, precedents appear not to exist for business models like Agri-wallet's (overdrafts to smallholders and small, short-term overdrafts to SMEs)
- **There are steps that Agri-wallet can take to mitigate key risks around FX and cash drag**
  - **FX:** Agri-wallet fund can take on local currency funding (which we have modelled to increase in outer years), but amount and cost of debt depends on investor appetite (TBC)
  - **Cash drag:** Investors (especially impact investors) into fund may only wish to provide funding on a fixed-term basis rather than a flexible line of credit – reducing equity returns if ramp-up is slower than expected. It may be worth trying to and even paying extra for a line of credit, which would be more complex but potentially safer for the fund

# Reading guide

SDM overview

Agri-wallet's performance

**VCPs' performance**

Farmer performance

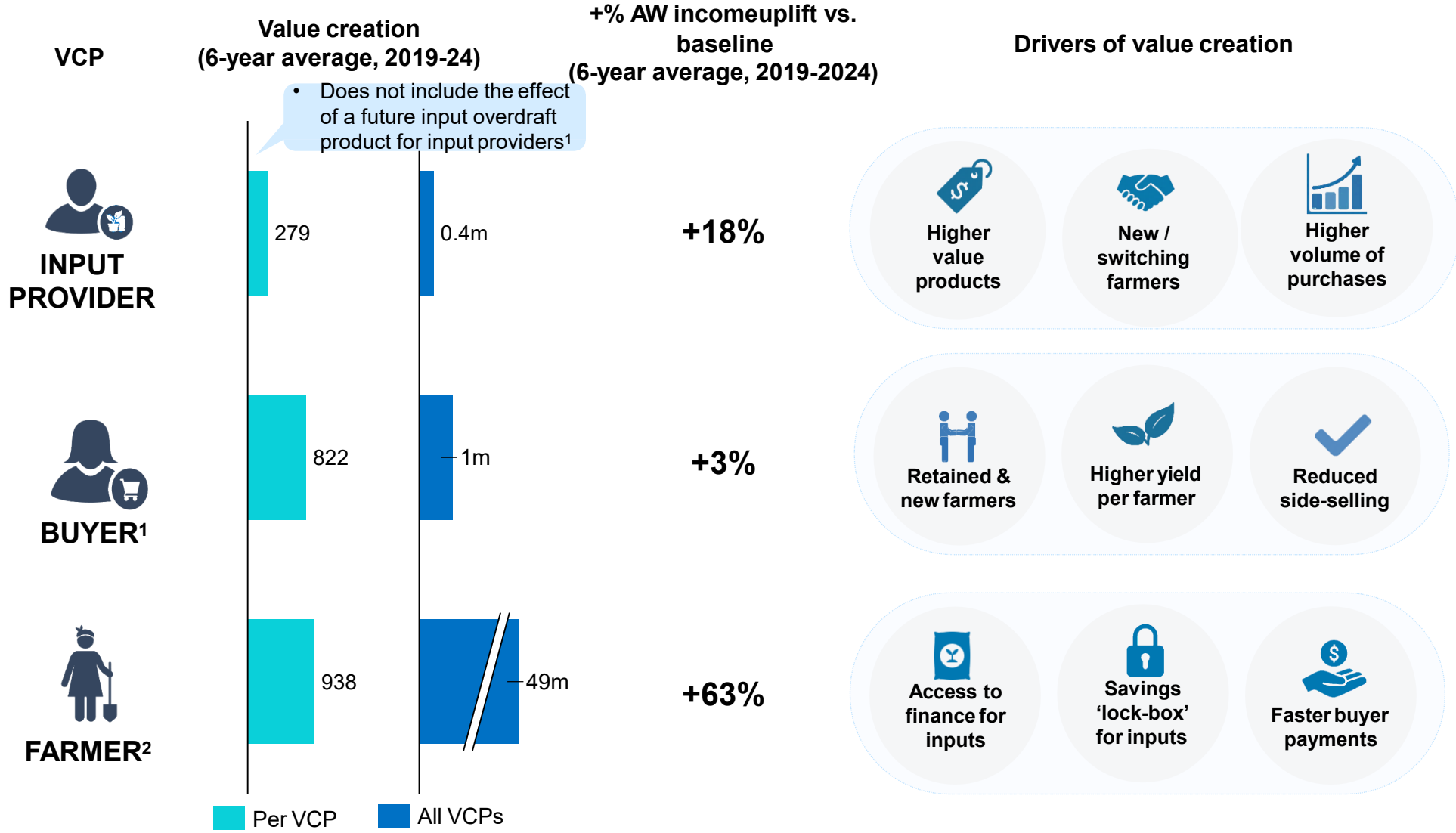
Opportunity pathways

This section presents in detail the impact Agri-wallet makes across the value chain for actors that operate in the SDM.

In this section you will:

- ✓ Get an overview of all the value chain players involved in the SDM and the value proposition to them
- ✓ Understand the financial performance of the different value chain players

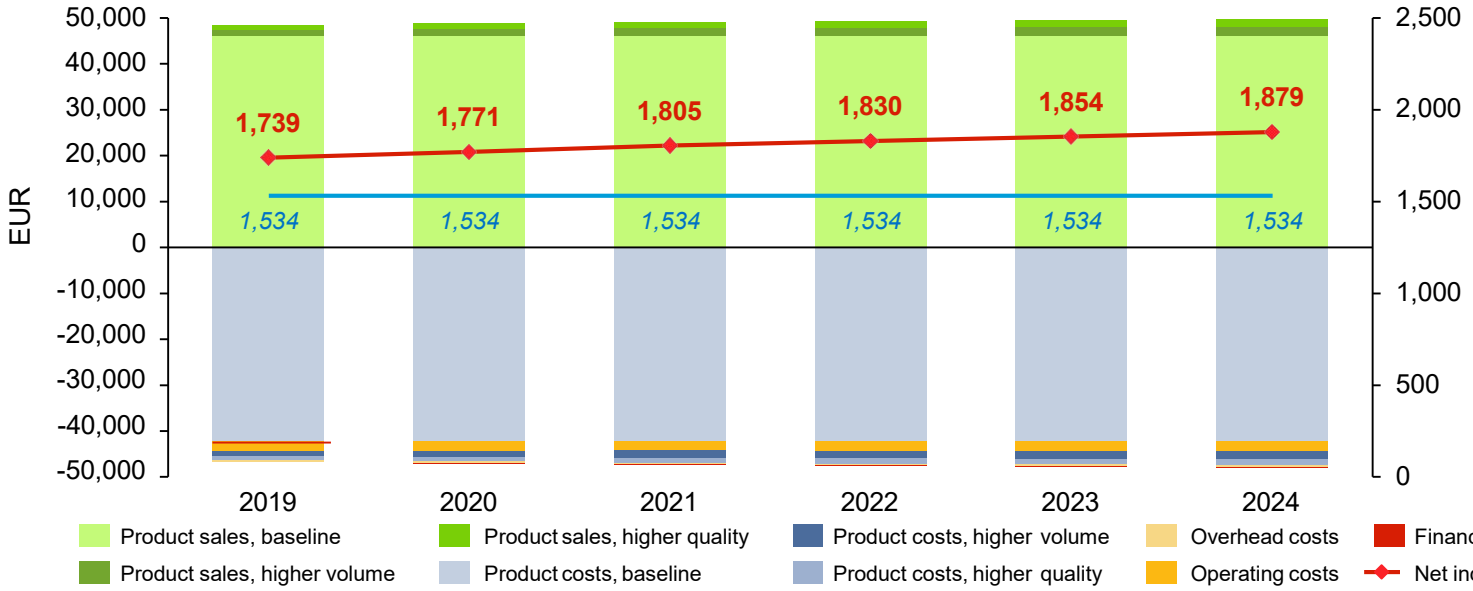
# **Value proposition** | Agri-wallet offers a compelling value proposition to its value chain partners, particularly for buyers




*1 Agri-wallet is considering a overdraft product for Input Providers, structued similarly to the buyer overdraft*
*2 Value creation only for average buyers and farmers receiving AW overdrafts, based on average default and graduation rates for each*

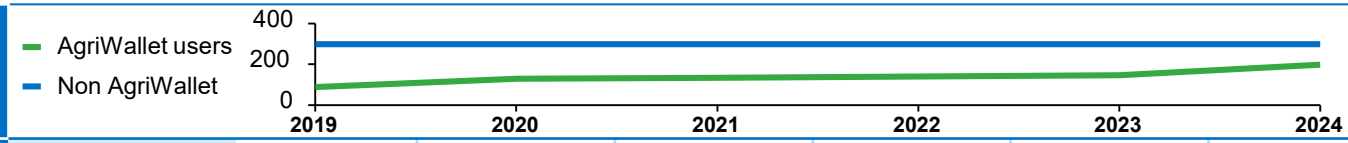
# **Input providers** accepting Agri-wallet credit see net income uplift driven by increased product sales

**P&L for input providers, 6-year annual average (EUR)**




- The net income increase is due to **an increase in farmers purchasing inputs** at a given provider, using AW credit.
- The impact is highest when an input provider faces **no competition** for AW credit, and might decrease over time.
- Input providers might capture **additional impact** if AW farmers consolidate their cash purchases at the same providers where they can use AW credit.

**Number of farmers**



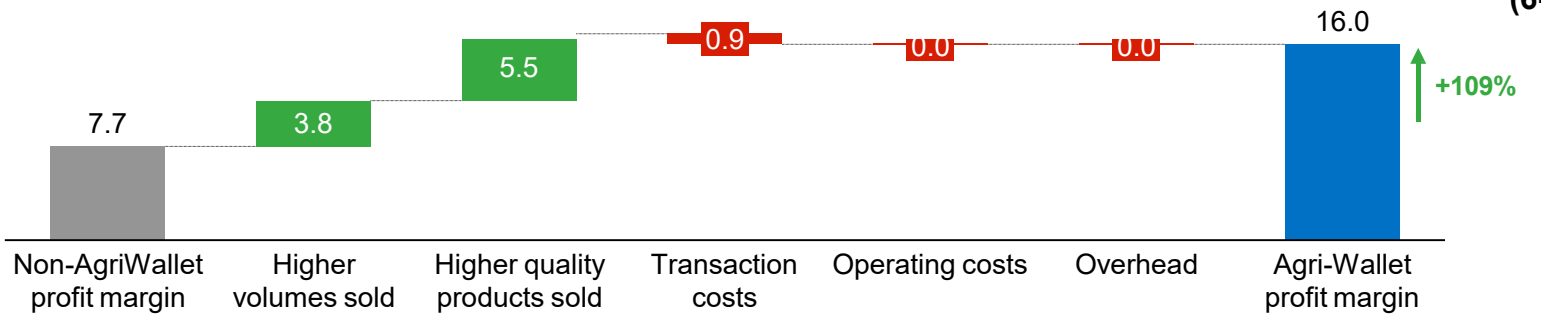

| | | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|
| **Net income (EUR, total)** | **Non-Agri-wallet** | 1,534 | 1,534 | 1,534 | 1,534 | 1,534 | 1,534 |
| | **Agri-wallet** | +205 | +237 | +270 | +296 | +320 | +344 |
| | **Growth % AW vs. baseline** | 13% | 15% | 18% | 19% | 21% | 22% |
| **Income per farmer (EUR)** | **Non Agri-wallet** | 7.7 | 7.7 | 7.7 | 7.7 | 7.7 | 7.7 |
| | **AW overdraft farmers** | +9.6 | +10.5 | +9.5 | +7.7 | +6.5 | +6.3 |
| | **AW savings farmers** | +0.38 | +0.42 | +0.47 | +0.52 | +0.58 | +0.62 |

- The number of non-Agri-wallet farmers is kept **constant** to isolate for the effect of Agri-wallet.
- For detailed assumptions see the Annex.

***Click to go to assumptions***

# **Input providers** make higher profits from Agri-wallet farmers by selling higher quality products with larger unit margins

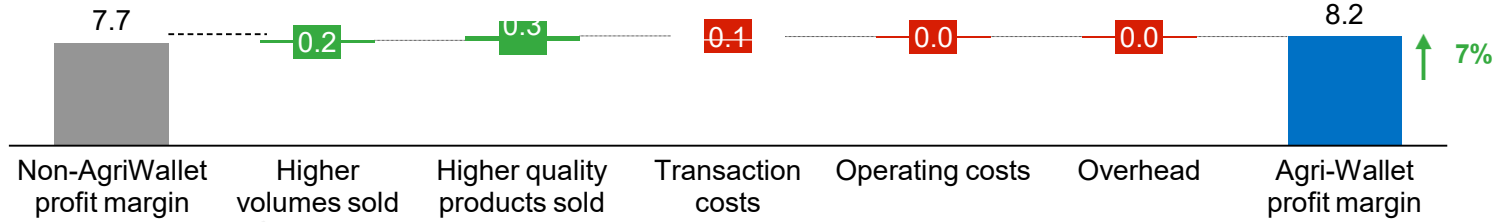
**Net annual net income margin per Agri-wallet overdraft farmers, 6-year annual average (EUR/year**




**% of total farmers (6-year average)**

**12%**
**~30 farmers**

**Net annual net income margin per Agri-wallet savings farmers, 6-year annual average (EUR/year)**

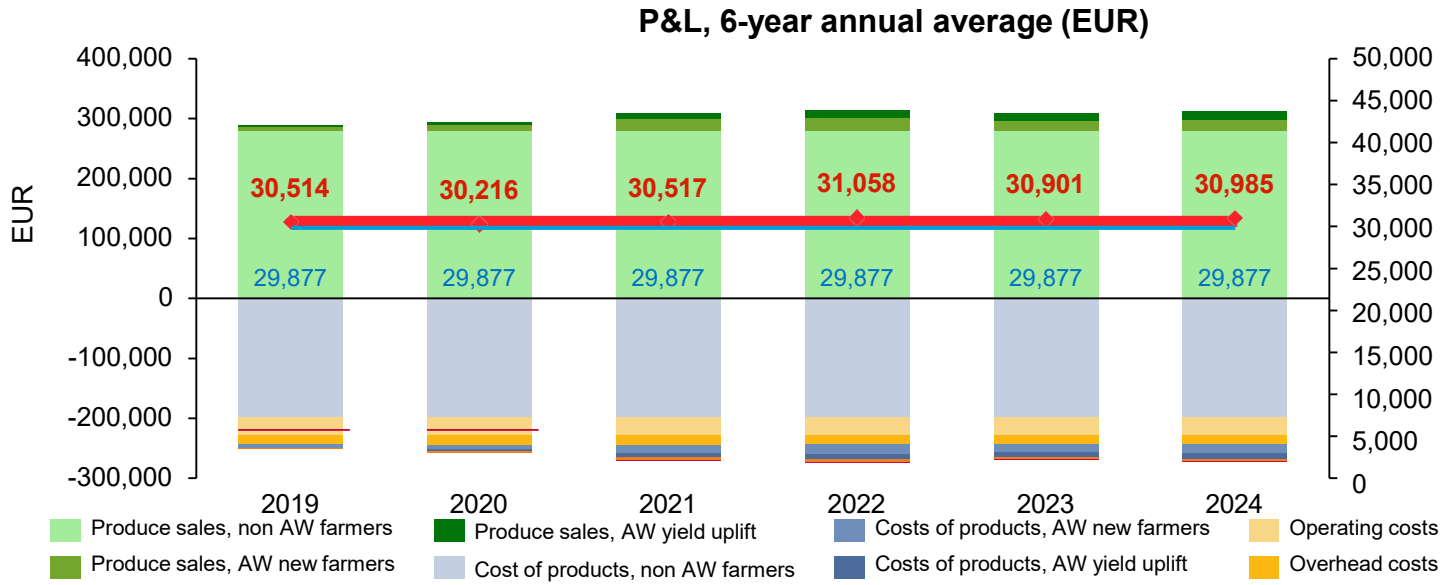



**20%**
**~50 farmers**

- Both analyses assume farmers spend 100% of their **AW credit at a single input provider,** and that this spend is all **additional** to farmers' previous input spend (see Annex for full assumptions).
- Also assume input providers are not passing the transaction fee onto farmers, while primary research showed some do.

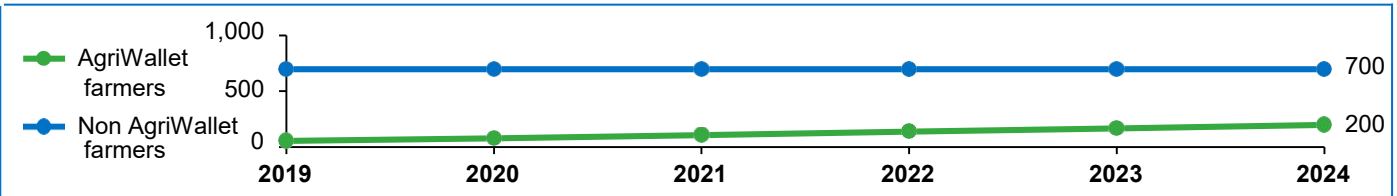
- The purchases made by each new overdraft farmer result in an average net income uplift *per farmer* of **109%**. Agri-wallet overdrafts allow farmers to:
  - Purchase higher quantities of basic inputs (e.g. fertilizer and dairy fodder).
  - Purchase higher quality inputs, which have higher *per product* margins for input providers. For example, almost **60% of AW overdraft farmers purchase certified seeds**, while only **~20% of baseline farmers do**. The uptake of agrochemicals (especially fungicides and herbicides) is also significantly higher for AW overdraft customers.
- The purchases made by customers saving in Agri-wallet (but not taking out a overdraft) are equivalent to ~10% of the additional spend by overdraft farmers. They result in a *per farmer* net income uplift of **~7%.**

# **Buyers** taking an Agri-wallet overdraft see a net income uplift, driven by the ability to purchase higher volumes of produce




- The net income increase is due to **an increased volume** of product purchased from farmers through their **AW overdraft.**
- The net income grows over time as **the average buyer overdraft increases.**
- Buyers might also see indirect benefits from AW, including **payment efficiencies** and **increased farmer loyalty** and **reliability.**

**Number of farmers**




**Net income (EUR)**

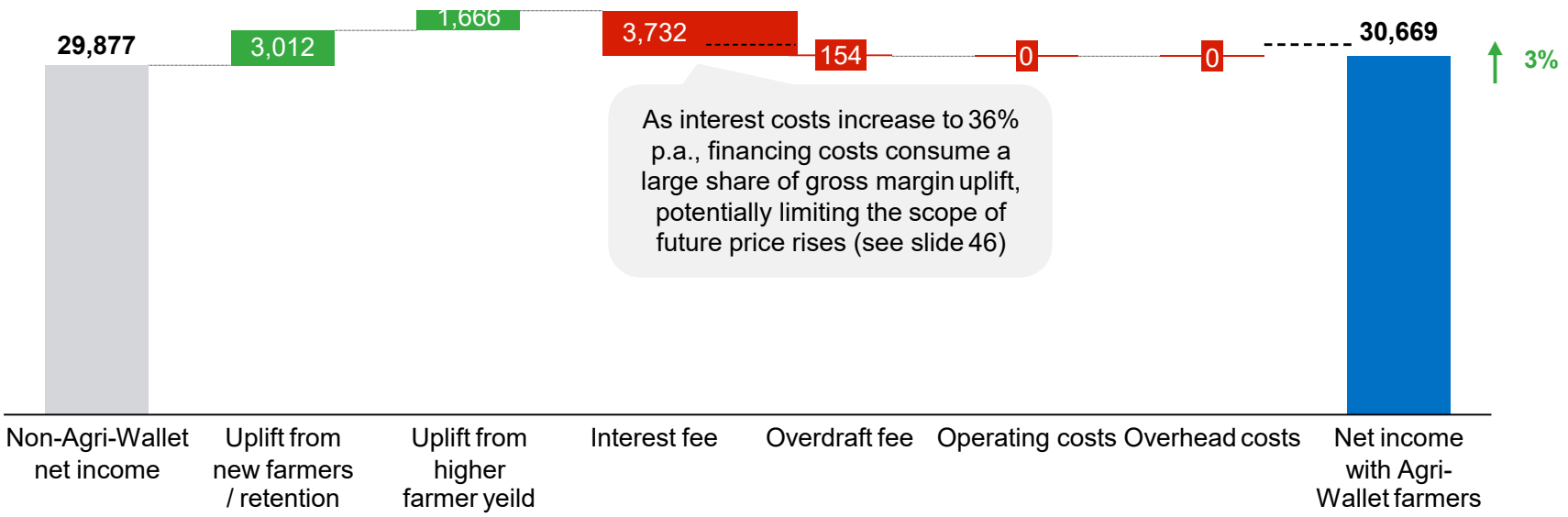
| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| **Non Agri-wallet** | 29,877 | 29,877 | 29,877 | 29,877 | 29,877 | 29,877 |
| **Agri-wallet** | +638 | +339 | +640 | +1,181 | +1,024 | +1,109 |
| **Growth % AW vs. baseline** | 2% | 1% | 2% | 4% | 3% | 4% |

- The number of non-Agri-wallet farmers is kept constant to isolate the effect of Agri-wallet.
- For detailed assumptions see the Annex.

***Go to assumptions***

# **Buyers** see the majority of their uplift from attracting and retaining farmers, allowing them to purchase higher volumes of produce

**Total net annual income uplift from AW farmers, 6-year annual average (EUR/year)**




- Net income uplift for buyers comes from purchasing additional volumes of products, by **attracting new farmers** or **retaining previously unreliable farmers,** rather than a *per product* uplift in margins.
  - Faster farmer payments mitigate the risk of losing farmers due to irregular payments or competition, and reduce the volume of product lost to side-selling.
- Buyers are also able to purchase additional volumes from AW overdraft farmers who see **increased yields** by purchasing more and better inputs.
  - To encourage farmers to produce improved yields, some buyers **require farmers to save 10% of revenue** in Agri-wallet, in order to receive farmer payments.
  - Overdraft-taking farmers see **10x the yield uplift** of savings-only farmers.

- We assume that the scale of the AW volume uplift remains **too small** for buyers to make **investments in new equipment, storage or labor.**
- In future, additional investments might be required, increasing these costs. Buyers would require financing for these investments.

1. Based on an assumed financing period of 3 months, with 4 overdrafts per buyer per year and utilization at 60-70%

# **Buyer** impact from Agri-wallet is highly variable and depends on the growth of their overdraft as well as their business model

- The **main constraint** on buyer benefits is the **size of the Agri-wallet overdraft** granted. A larger overdraft enables buyer to purchase additional produce from farmers, and earn additional revenue.
- If AgriWallet were to scale up the size of its buyer overdraft, the **average 3% net income uplift could significantly increase.**
  1. Increasing the **size of the first overdraft** granted to buyers by **200%** could increase the net income uplift to 17% (6 year average).
  2. Increasing the growth rate of overdrafts between the first and second cycle overdrafts from the current **57%** to **200%** could increase net income uplift by 10%
- However, increasing the size of the first overdraft **implies higher potential risk for Agri-wallet,** due to observed higher default rate on earlier overdrafts.

**Range of income uplift outcomes(%)**

Current scenario

1 **Increasing the size of the first buyer overdraft**[1]

| *First overdraft size (EUR)* | baseline | +50% | +100% | +200% |
|---|---|---|---|---|
| *Net input uplift (%)* | **3%** | **8%** | **11%** | **17%** |

2 **Increasing growth from the first overdraft cycle to the second cycle**

| *Growth of overdraft 1st to 2nd cycle (%)* | 57% per cycle | 100% per cycle | 150% per cycle | 200% per cycle |
|---|---|---|---|---|
| *Net input uplift (%)* | **3%** | **7%** | **9%** | **10%** |

Beyond the size of their overdraft, the impact of Agri-wallet on each buyer will vary significantly based on the **business and operating model of the specific buyer. F**or example:

- **Larger commercial buyers** use AW payments to attract unbanked, small-scale farmers amongst their larger farmer pool, and increase their supplier base.
- **Smaller cooperatives** focus on helping their farmer afford inputs and increase their yields, to improve the quality and quantity of product they are able to purchase
- **Contract-buyers** work on improving the loyalty and reliability of farmers, reducing side-selling and improving risk-mitigation.

# Reading guide

SDM overview

Agri-wallet's performance

VCP's performance

**Farmer performance**

Opportunity pathways

This section presents the impact at farm 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) impact the farmer business case

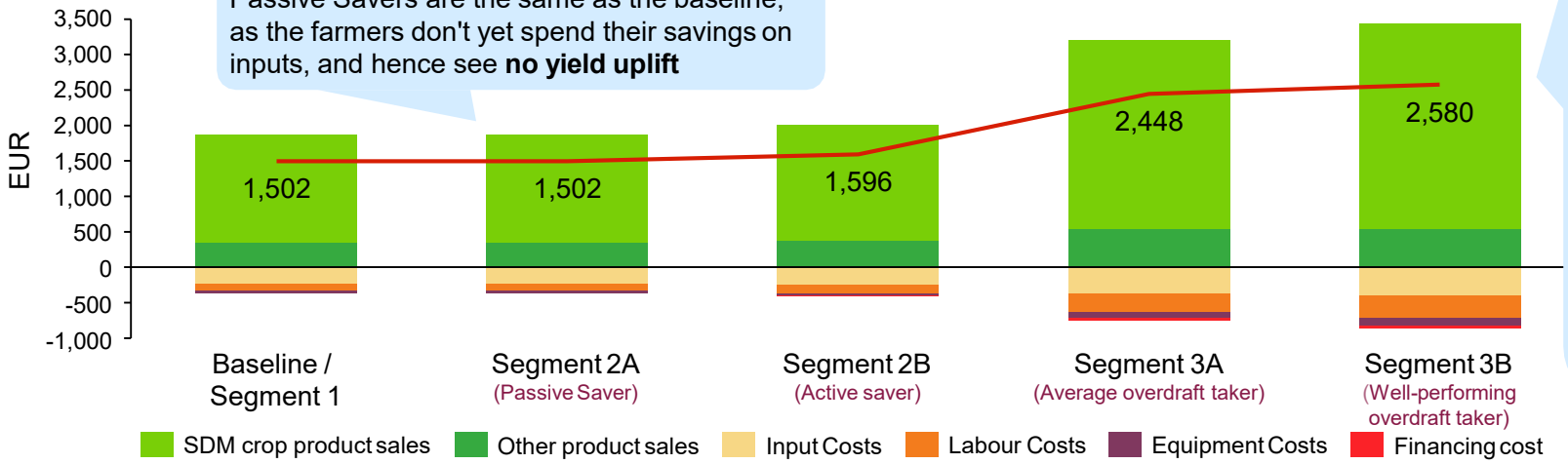
# **Farmer context** | Profile of farmers addressed by Agri-wallet

| | Segment 1 | Segment 2A | Segment 2B | Segment 3 |
|---|---|---|---|---|
| **Services** | No Agri-wallet services | Passive Saver | Active saver purchasing inputs | Overdraft Farmer purchasing inputs |
| **Explanation** | Receives buyer transactions in M-PESA Does not open an Agri-wallet to save funds for inputs or apply for overdraft | Signs up for AW by saving a portion of payments, or paying into the wallet cash, but does not purchase inputs in a year | Signs up for Agri-wallet and purchases inputs at least once a year using savings in Agri-wallet | Receives an overdraft from AW and uses it purchase inputs < once a year. Repays within 12 months |
| **CLTV** | | | | |
| **CAC** | | | | |
| **Agri-wallet farmers** 2018 | 9% | 38% | 38% | 15% |
| **Agri-wallet farmers** 2024 | 9% | 31% | 31% | 30% |

Total income per farmer is low, given current scale and costs. Slide 65 shows how these metrics can increase

# **Income performance |** Agri-wallet farmers using an overdraft to purchase additional inputs see up to a 62-71% increase in net income

**Net income per farmer segments, 6-year annual average, per farmer (USD)**




Active savers and overdraft takers see **higher net income** due to yield increases, driven by their increase spend on inputs,
At current default and graduation rates, 28% of segment 3 farmers are '**well performing':** expected to take larger overdrafts yearly, seeing **higher benefits**

**Main drivers of net income differences between the segments**

**Passive and Active Savers (2A, 2B)** save a portion of income in Agri-wallet, earmarked for inputs

**Overdraft Takers (3A, 3B)** obtain an input overdraft of KSh ~10,000 on top of their savings

**Active Savers and Overdraft Takers** use their savings and overdrafts to purchase greater input quantities and switch to higher quality products.

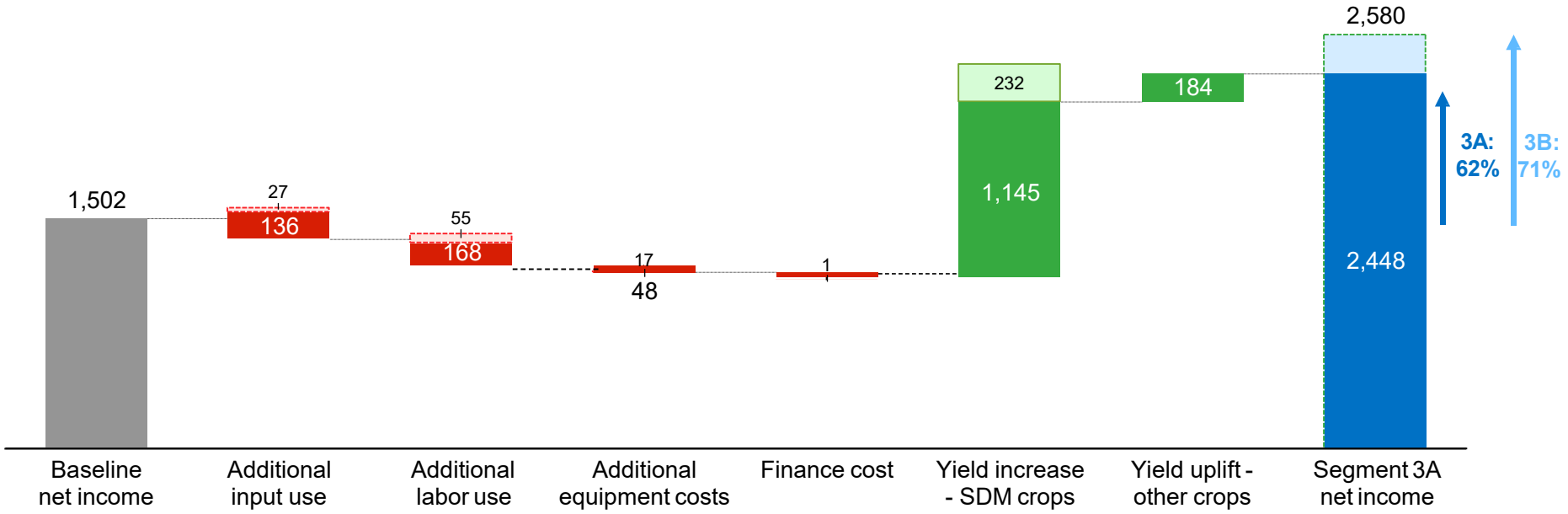
**Overdraft Takers** are able to sell up to **100**% more produce due to their yield uplift, while **Active Savers** farmers sell up to **10% more.**

**All farmers** benefit from fast payments from buyers, and avoidance of **middlemen,** who often overfill bags and take a commission

***Click to go to assumptions***

# **Farmer Performance** | Average segment 3A farmers see small increases in input, labour and equipment use, for a large yield uplift

**Net income per segment 3A farmer, 6-year annual average (EUR)**



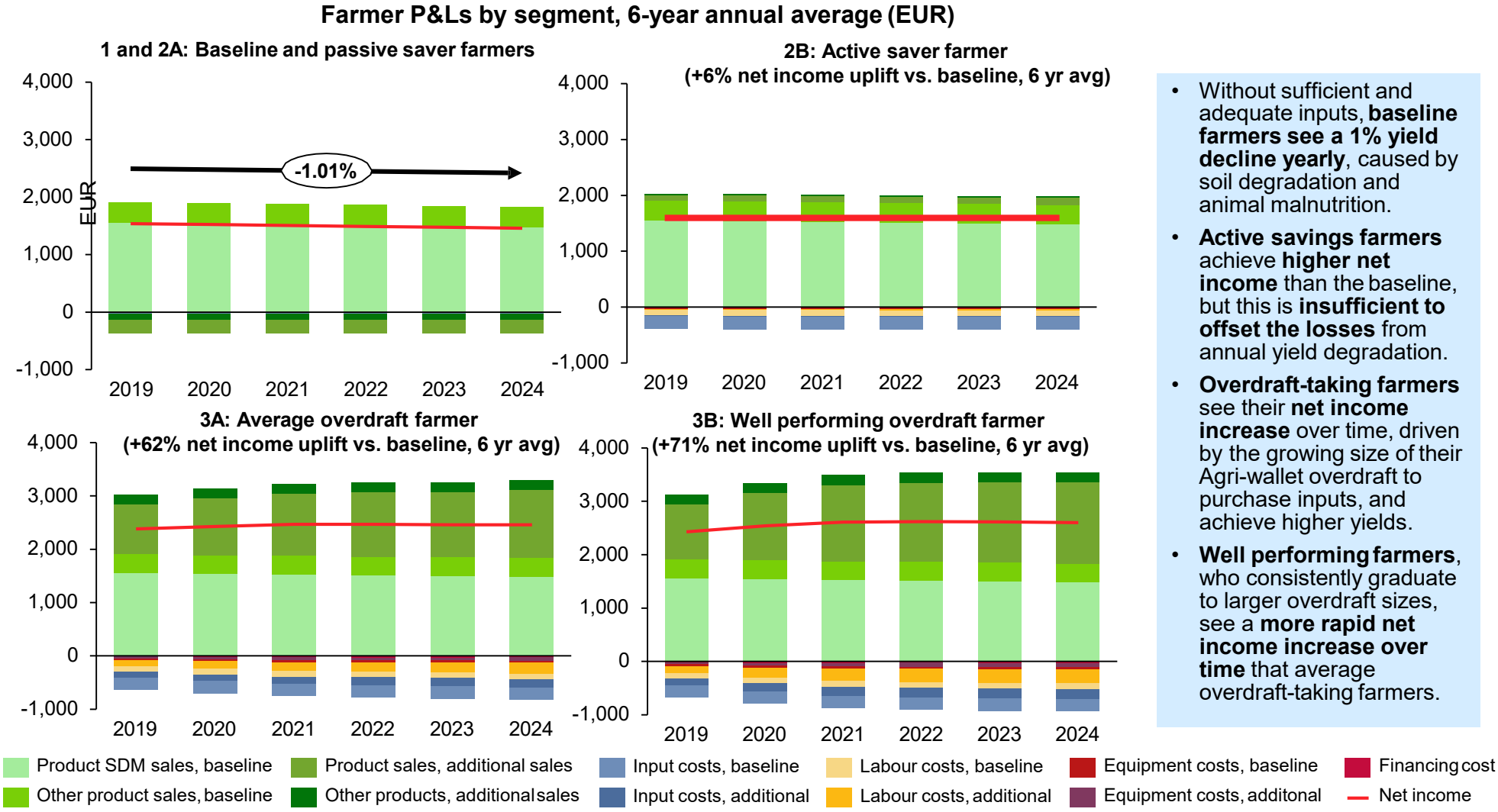

The additional is driven by increasing input spend, which is equivalent to the **size of the Agri-wallet overdraft:**

- Well performing overdraft farmers see higher input spends, as they consistently graduate to higher overdraft sizes. By 2024 they reach a overdraft size of KSh 20,500 (180 EUR).

Farmer's additional spend on inputs results in **higher yields, and consequently higher revenue from product sales**.

- Different products experience different yield uplift effects, ranging between 80-120% uplift on potatoes, 40-70% uplift on tomatoes and 30-50% uplift on milk.
- Primary data also showed that overdraft farmers experienced **50**% increase in the revenue from other crop income**,** which indicates the use of additional inputs on other crops.

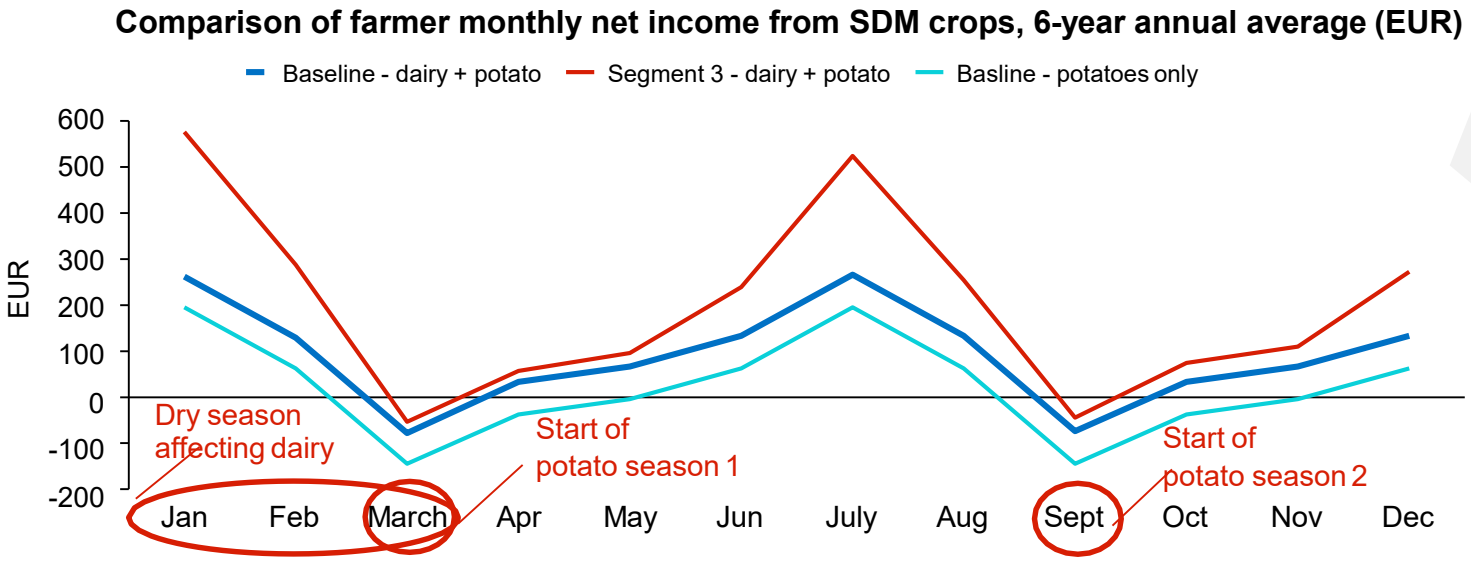
# **Farmers** | Over time, overdraft farmers see an increase in net income, which offsets a baseline decline due to yield degradation




- Without sufficient and adequate inputs, **baseline farmers see a 1% yield decline yearly**, caused by soil degradation and animal malnutrition.
- **Active savings farmers** achieve **higher net income** than the baseline, but this is **insufficient to offset the losses** from annual yield degradation.
- **Overdraft-taking farmers** see their **net income increase** over time, driven by the growing size of their Agri-wallet overdraft to purchase inputs, and achieve higher yields.
- **Well performing farmers**, who consistently graduate to larger overdraft sizes, see a **more rapid net income increase over time** that average overdraft-taking farmers.

*1 Assumes linear growth of yield increases and costs, proportional the growing size of a farmer's input overdraft. By 2024 we are assuming an average 91% yield uplift across dairy and potatoes.*

# **Risk |** Farmers experience net income fluctuation across the year, and see highest costs and lowest revenues in March and September




This graph is focused only on SDM crops. It doesn't include **income from other crop sources** (350-500 EUR yearly), **other non-crop revenue sources** (700-1000 EUR yearly), or **non-crop costs** (e.g. school fees).
Primary data shows that if considering additional revenues and costs, **the most cash-poor months are January and May.**

| | | | | | | | | | | | | | Tot. baseline | Tot. Seg. 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Revenue potatoes** | 8% | 8% | 8% | 8% | 8% | 8% | 8% | 8% | 8% | 8% | 8% | 8% | 855 EUR | 1,237 EUR |
| **Revenue dairy** | 30% | 10% | 0% | 0% | 0% | 10% | 30% | 10% | 0% | 0% | 0% | 10% | 664 EUR | 1,427 EUR |
| **Baseline costs** | 2% | 2% | 37% | 9% | 1% | 1% | 1% | 1% | 36% | 9% | 1% | 1% | 405 EUR | / |
| **Segment 3 costs** | 10% | 10% | 24% | 7% | 1% | 1% | 1% | 3% | 24% | 10% | 3% | 6% | / | 649 EUR |

- On average, **overdraft-taking farmers see lower net income dips**, as they repay overdrafts over 12 months, and see higher revenues.
  - Overdraft-taking farmers are also covered by **insurance**, lowering their risk profile. The effect of insurance is not modelled.
- Overall, farmers see their SDM-crop related income dip between January and April, and August-October:
  - The **dry season** increases dairy costs, as farmers purchase additional fodder and medicine to ensure cow nutrition.
  - The **start of each season** requires significant costs of potato farmers, as farmers bulk purchases inputs, labour and equipment.
- Farmers who produce and sell both dairy and potatoes see smaller dips, as dairy provides **steady year-round income.**
  - Given that most farmers are multiple-crop farmers, other-crop revenue might offset the effect of these dips further. Most farmers also receive revenue from non-crop sources, to offset these costs.

# **Sensitivity Analysis** | Farmers with Agri-wallet overdrafts are more sensitive to market risks, but are covered through AW insurance

**Change in farmer net income due to shocks, Max revenue from SDM crops, 1.3 acres**

**Baseline (6-year average)**

*Change in price (%, call crops)*

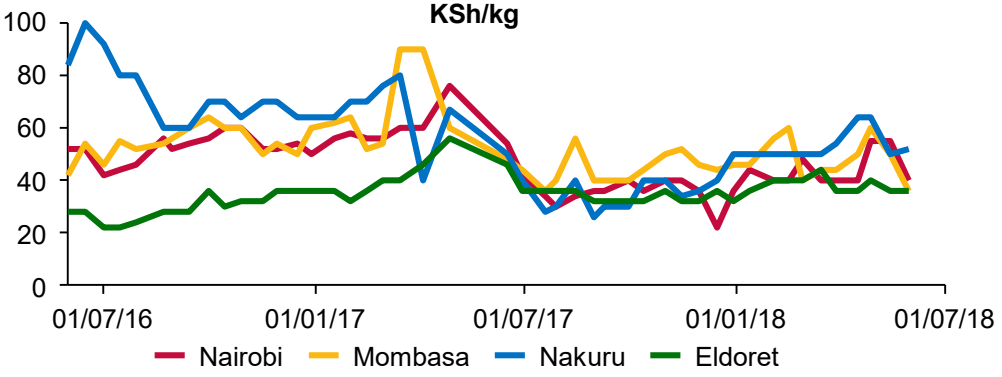
| *Change in crop yield (%, all SDM crops)* | -40% | -30% | -20% | -10% | 0% | 10% | 20% | 30% | 40% | 50% |
|---|---|---|---|---|---|---|---|---|---|---|
| 0% (Current scenario) | -40% | -30% | -20% | -10% | 0% | 10% | 20% | 30% | 40% | 51% |
| 15% | -31% | -20% | -8% | 4% | 15% | 27% | 39% | 50% | 62% | 74% |
| 30% | -22% | -9% | 4% | 18% | 31% | 44% | 57% | 70% | 84% | 97% |
| 46% | -13% | 2% | 17% | 31% | 46% | 61% | 76% | 90% | 105% | 120% |
| 61% | -4% | 13% | 29% | 45% | 62% | 78% | 94% | 110% | 127% | 143% |
| 76% | 6% | 24% | 41% | 59% | 77% | 95% | 113% | 130% | 148% | 166% |
| 91% | 15% | 34% | 54% | 73% | 92% | 112% | 131% | 150% | 170% | 189% |
| 107% | 24% | 45% | 66% | 87% | 108% | 129% | 150% | 170% | 191% | 212% |
| 122% | 33% | 56% | 78% | 101% | 123% | 146% | 168% | 191% | 213% | 235% |
| 137% | 43% | 67% | 91% | 115% | 139% | 163% | 187% | 211% | 235% | 258% |

**Average overdraft taker (Y3- 2021)**

*Change in price (% , all crops)*

| *Change in crop yield (%, all SDM crops)* | -40% | -30% | -20% | -10% | 0 | 10% | 20% | 30% | 40% | 50% |
|---|---|---|---|---|---|---|---|---|---|---|
| 0% | -67% | -59% | -51% | -43% | -35% | -27% | -18% | -10% | -2% | 6% |
| 15% | -60% | -51% | -41% | -32% | -22% | -13% | -4% | 6% | 15% | 25% |
| 30% | -53% | -42% | -31% | -21% | -10% | 1% | 11% | 22% | 33% | 43% |
| 46% | -45% | -33% | -21% | -9% | 2% | 14% | 26% | 38% | 50% | 62% |
| 61% | -38% | -25% | -11% | 2% | 15% | 28% | 41% | 54% | 67% | 81% |
| 76% | -30% | -16% | -1% | 13% | 27% | 42% | 56% | 70% | 85% | 99% |
| 91% | -23% | -7% | 9% | 24% | 40% | 55% | 71% | 87% | 102% | 118% |
| 107% | -15% | 2% | 18% | 35% | 52% | 69% | 86% | 103% | 120% | 137% |
| 122% | -8% | 10% | 28% | 47% | 65% | 83% | 101% | 119% | 137% | 155% |
| 137% | 0% | 19% | 38% | 58% | 77% | 96% | 116% | 135% | 154% | 174% |

**Example: Bi-weekly white potato wholesale prices, 06/2016 –05/2018**




**Source: Technoserve, (2019). "Kenya Potato ISP" (NAFIS wholesale prices)*

**Wholesale and farm-gate prices can fluctuate 50-100% between peak and low season.** This puts farmers at risk of decreased revenues, and can threaten their ability to repay their overdrafts

- **Overdraft taking farmers** make higher investments on their farms, including input spends, labor costs and equipment, and hence face **higher potential loss caused by price or yield shocks**.
- However, overdraft taking farmers are **required to take out insurance** from Agri-wallet, which reduces their vulnerability to market and climate risks in terms of their overdraft repayment.
  - Agri-wallet farmers have a variety of insurance models. An insurance pay-out would occur if yields dropped below a certain threshold, limiting the impact of the shock on the farmer's net income.

# Reading guide

SDM overview

Agri-wallet's performance

VCP's performance

Farmer performance

**Opportunity pathways**

This section presents an analysis of the main opportunities for Agri-wallet reflecting on the opportunities and challenges described throughout the analysis.

In this section you will:

- ✓ Understand the opportunities for Agri-wallet to improve their SDM
- ✓ Get an assessment of the prioritization between value created and ability to implement the opportunities

# **Strengths & weaknesses** | Agri-wallet's model shows material opportunities based on its sound value proposition, and some risks

## Opportunities

- **High opportunity to scale based on huge latent demand** for Agri-wallet's product; assuming ability to scale, Dodore Kenya (as part of a managed blended finance facility model) could break even within Kenya in 2021 with grants, and 2024 without grants
    - The **ear-marking** of funds in the product, as well as **high integration across multiple stakeholders**, increases customer loyalty to Agri-wallet and creates a network effect as it scales
- There is high opportunity to **drive profitability amongst buyers through better targeting and customer care** *(see following section on portfolio segmentation)* – buyers are a particularly profitable segment (given higher pricing) and are the key leverage point for further growth in farmer numbers, as they benefit from farmers being more productive
- There could be opportunity to drive pricing including interest rates and transaction fees, as the **value proposition** to farmers, buyers and input providers is very strong given the clear yield uplifts from e.g. investment in agricultural inputs

## Risks & barriers

- **Access to capital** is the key barrier to growing and unlocking latent demand, with alternative funding required as the Rabobank grant ends
- Agri-wallet must reach a large amount of new farmers in the next 5 years which requires a significant **increase in variable costs** including for commission-based agents and field & call centre staff, and may also create management challenges. **Digital costs** (i.e. paying Coin 22) and some **overheads** could bring returns to scale, but these make up a relatively low proportion of costs
- Agri-wallet faces **upwards pricing pressure** with higher capital costs (although this is mitigated by potential opportunity to raise prices given customers' high value from the product)
- **Credit risk** is a key risk that need to be managed; although Agri-wallet is making improvements in this area, the impact of these remains relatively untested given the maturity of the business
- **Integration with input providers** could pose a risk as well as an opportunity, as Agri-wallet is reliant on them e.g. currently many pass transaction costs on to farmers, a practice which is challenging for Agri-wallet to stop

# **Opportunity pathways** | Overview of key opportunities

| | What is the opportunity? | Why is it important? |
|---|---|---|
| 1 **Use buyer portfolio segmentation to improve sales & marketing and account mgmt.** | Create a segmentation of the buyer portfolio based on performance data and assumptions on utilization, repayment and attrition / default behavior – and use the insights to improve approach to sales & marketing, targeting and on-boarding, and customer care (e.g. to encourage repayment) | • Buyers are the key leverage point to on-board farmers and bring further scale, and bring higher profitability vs. other products<br>• Profitability varies substantially across Agri-wallet's buyers, suggesting opportunity to improve profitability by better targeting buyers and managing relationships with them |
| 2 **Create off-balance sheet funding structure** | Move customer receivables and debt funding off the balance sheet to an off-balance-sheet Special Purpose Vehicle, which would provide customer overdrafts. The Dodore Kenya local entity would be responsible for company operations including customer onboarding and care, default management, and the fintech platform | • Access to capital is the main barrier for the business to scale, given high latent demand across customers<br>• Off-balance sheet funding would reduce risk for investors and the cost of financing, therefore allowing the business to unlock more scale |
| 3 **Develop and optimise pricing strategy** | Test customer price elasticity and potential to shift the price structure, in particular given the context of high customer value uplift, and upwards pricing pressure due to higher capital costs | • Pricing is a key point of differentiation of Agri-wallet vs. competitors, and is a significant driver of Agri-wallet's profit |

# **Opportunity pathways** | Buyer segmentation and off-balance-sheet funding could offer the largest impact on Agri-wallet's profitability

High Med Low

High Med Low

| | Total value creation potential (cumulative over 6 years) | Can Agri-wallet do this on its own? | Risks |
|---|---|---|---|
| 1 **Use buyer portfolio segmentation to improve sales & marketing and account mgmt.** | €1-2m<br>Agri-wallet value<br>*Plus associated upside for farmers, buyers, & input dealers from more access to credit* | Agri-wallet should have high control over buyer portfolio segmentation provided sufficient analytical resource | Improving customer care and buyer targeting should reduce credit risk by improving buyer behavior and overall crop mix |
| 2 **Create off-balance sheet funding structure** | "System" profits increase by €1m total<br>along with reduced credit & FX risk and lower equity requirement for Dodore (as operator) | Availability of debt and equity at suitable scale and cost, and appropriate credit guarantees, appears promising but is not entirely in Agri-wallet's control | Off-balance-sheet funding would reduce overall business risks (although FX and credit risk will vary with different models e.g. based on currency mix of funding) |
| 3 **Develop and optimise pricing strategy** | *Pricing is currently subsidized and may need to increase.*<br>*Net income impact will vary depending on price elasticity (to be tested in trials)* | Agri-wallet has good control over its pricing, balanced with the need to keep it relatively simple and consistent for customers | Although many customers have few alternatives to Agri-wallet, increasing prices could potentially risk reducing volume and/or lowering customer satisfaction |

1

# **Buyer segmentation** | There is high opportunity for buyer segmentation analysis to drive improved performance

Identifying buyers, and buyer characteristics, which drive profitability is of high importance given that buyers are the scale driver in the business (signing up further farmers), and show higher profitability vs. other Agri-wallet services (given higher pricing)

## Key buyer characteristics

*Focus of our CLTV projections based on quant assumptions – drawing from limited sample size*

| Variable | Importance as lever | Commentary |
|---|---|---|
| Graduated overdraft growth | Very High | Key driver of overdraft and interest revenue; also important to manage risk by allocating higher overdrafts to more reliable buyers |
| Initial overdraft size | High | Important driver of CLTV alongside graduated growth |
| Utilisation rate | Medium | Relatively high sensitivity but limited headroom / control to grow for existing buyers |
| Number of farmers | Medium | CLTV from farmers associated with buyers makes up ~30% of overall CLTV per buyer |

*Other characteristics to consider include: crop mix, social vs. commercial, buyer's buyer agreement structures, ability to produce & process throughout the year, etc. Further work required to assess their importance*

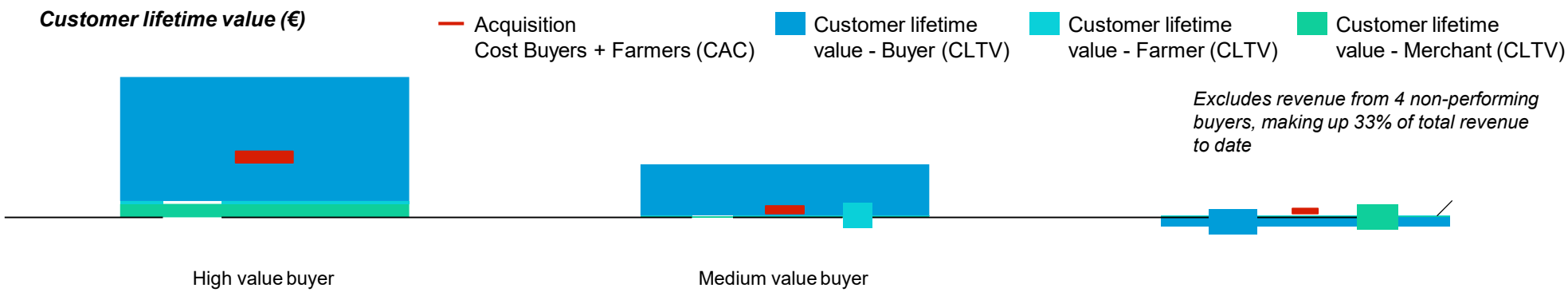
## Key areas to apply buyer segmentation insights

- Targeting of buyers
- Buyer marketing
- Key account management & customer care
- Credit risk management

1

# **Buyer segmentation** | Understanding the profitability of each buyer is key to targeting a buyer mix to maximize customer lifetime value

| | HIGH VALUE BUYERS | MEDIUM VALUE BUYERS | LOW VALUE BUYERS |
|---|---|---|---|
| Number of farmers | >500 | 100-500 | <100 |
| Starting overdraft size | 250,000 | 200,000 | 150,000 – 200,000 |
| Overdraft growth | <100% | 50% | 40% |
| Utilization rate | >75% | 70% | 45% |
| Share of revenue to date[1] | 62% | 24% | 14% |
| # in the sample | 4 | 4 | 5 |



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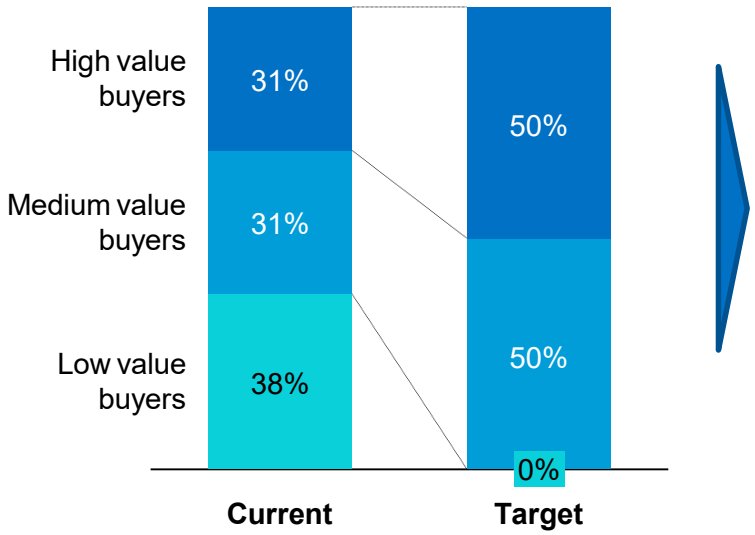
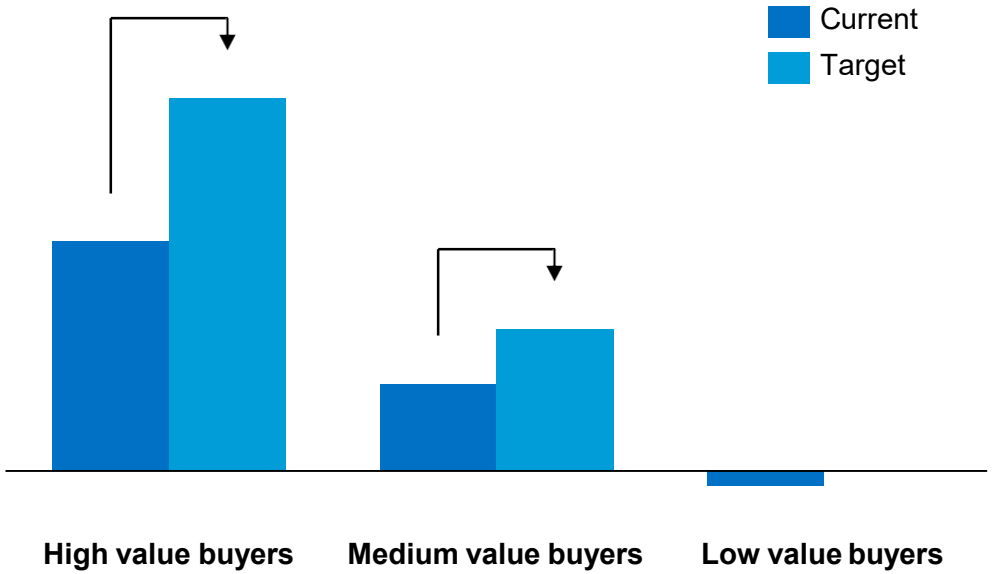
# **Buyer segmentation |** Improving the least profitable buyer archetype could help Agri-wallet increase CLTV from current buyers

**Current and target mix of buyer archetypes**




**Total CLTV from existing buyers (000s, EUR)**




Agri-wallet could see a total **CLTV uplift of 70%** from its current portfolio of performing buyers by improving the main revenue drivers of low-value byers, to reflect high and medium value buyers. These main drivers are:

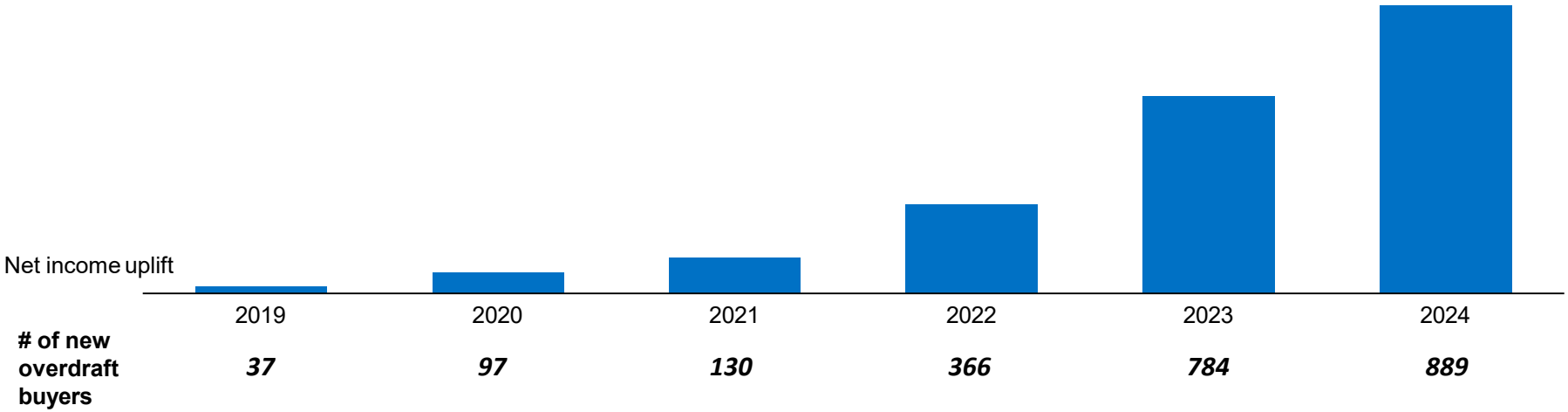
- **Initial overdraft size: ~30%** impact, by increasing initial overdraft by 15%
- **Overdraft growth: ~50%** impact, increasing overdraft growth by 110% YoY
- **Utilization rate: ~20%** Impact, increasing utilization by 58%
- **Agri-wallet Farmer numbers:** The number of AW farmers per buyer is linked proportionally to overdraft size and growth.

*1 Excludes revenue from 4 non-performing buyers, making up 33% of total revenue to date*

1

# **Buyer segmentation** | Improving the mix in this way for future new buyers could result in an income uplift per year

**Additional value generation through a target buyer segmentation, based on buyer growth (M, EUR)**



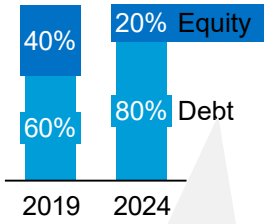
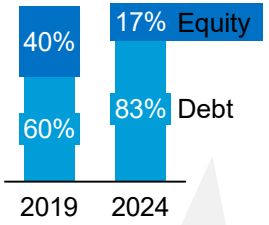
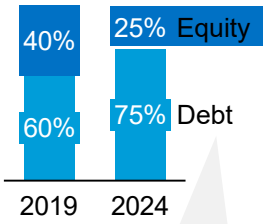
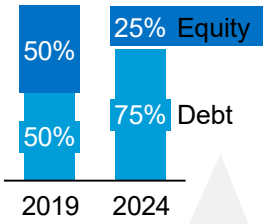

If **buyers on-boarded in future years** align to the target segment mix on the previous slide, this would lead to an **average 70% increase in annual new buyer CLTV**, or €**0.25m p.a. net income uplift.** To achieve this, Agri-wallet can:

1. Actively target buyers to fit the characteristics of high and medium value profiles, including a large farmer base, and high potential overdraft utilization driven by continuous product sales.
2. Support the growth of farmers registered per buyer by sending field agents to recruit and train new farmers through buyers, particularly focusing on new, smaller buyers.
3. More rapidly increase buyers' overdrafts growth over time, having tested the credit worthiness of each buyer through their initial repayment behavior.

# 2 Off-balance sheet funding | There are five key funding models the business could consider

The *Agri-wallet Performance* section shows 'system' profitability equivalent to an on-balance sheet funding model…

…and also shows the distribution of income within an illustrative scenario of a managed blended finance facility

| | 1 On-balance sheet funding | 2 Master (global) SPV | 3 Country-level SPV | 4 Retail SPV | 5 Managed blended finance facility |
|---|---|---|---|---|---|
| **Description:** | Conventional funding model with on-lending held **on the balance sheet** | Off-balance sheet vehicle created to issue € or US$ notes to **international funders** | Off-balance sheet vehicle created to issue KSh notes to **local funders** | Off-balance sheet vehicle created to issue € notes to **retail impact investors** | Blended finance facility attracting a **mix of impact and commercial debt & equity investors** |
| **High level assumptions:** | *All on balance sheet*   Debt in euros with increasing Ksh debt in later years | *Revenues of Dodore Kenya would consist of customer payments minus interest payments to the SPV*   Debt in € (or US$) |   Debt in KSh |   Debt in €, with limited overall capacity | *Revenues of Dodore Kenya (local entity) would consist of fund management fees paid by investors along with performance fees* |
| **Examples:** | • Agri-wallet *(current approach)* | • Off-grid solar players | • Off-grid solar players | responsAbility<br>SHAREDINTEREST INVESTING IN A FAIRER WORLD<br>Triodos Bank | LAFCo<br>incofin INVESTMENT MANAGEMENT |



Study by Mastercard Foundation RAF Learning Lab, IDH, and Dalberg |

# 2 Off-balance sheet funding | These models would require various trade-offs including scale constraints, capital costs, and liquidity

Reduced vs. current levels | Similar to current levels | Slightly higher vs. current | Substantially higher vs. current

| | A On-balance sheet funding | B Master (global) SPV | C Country-level SPV | D Retail SPV | E Managed blended finance facility |
|---|---|---|---|---|---|
| **Scale constraints** | Per current model | International funding to unlock much larger scale | Local funding could unlock somewhat larger scale | Constrained by retail market appetite, and relatively untested | Constrained by ability to raise fund & equity investment |
| **Liquidity (flexibility)** | Per current model | Eventually more flexible than current | Reduced vs. current, due to availability | Similar to current levels | Deployment risk is borne by fund investors |
| **Capital costs / interest rates** | Per current model | Slightly lower rates due to de-risking | Slightly lower rates due to de-risking | Much lower rates given typical retail interest rates | N/A; Agri-wallet acts as a servicer only |
| **Equity need / return on equity** | Per current model | Lower equity need given likely higher leverage | Increased equity need | Increased total equity need and lower % return | Lower equity need to fund Agri-wallet's operations |
| **Currency exposure** | Per current model | Similar to current levels (or higher in future) | Much reduced given local currency funding | Similar to current levels (or higher in future) | Currency risk is borne by fund investors |

# Off-balance sheet funding | Financial projections in each scenario

**Financial projections by scenario, 2019-24 averages**

Likely scale *(see following slide)*

| | 1 On-balance sheet funding | 2 Master (global) SPV | 3 Country-level SPV | 4 Retail SPV | 5 Managed blended finance facility[1] |
|---|---|---|---|---|---|
| **Scale at 1x** vs. assumptions in *Agri-wallet Performance*[2] | | | | | |
| Average net income | €13.3m | €1.2m | €14.3m | €11.5m | €0.5m |
| Total equity requirement | 26% | 47% | 30% | 49% | 290% |
| ROIC for Dodore Kenya | 16% | 27% | 18% | 26% | 25-30% for fund investors |
| Return on equity | 10% | 8% | 12% | 3% | ~7% |
| Average debt returns | | | | | |
| **Scale at 0.75x** vs. assumptions in *Agri-wallet Performance*[2] | | | | | |
| Average net income | 16% | €1.1m | €2.0m | €10.0m | €0.5m |
| Total equity requirement | 11% | 26% | 20% | 35% | 288% |
| ROIC for Dodore Kenya | 10% | 18% | 14% | 21% | 15-20% for fund investors |
| Return on equity | | 8% | 12% | 3% | ~7% |
| Average debt returns | | | | | |
| **Scale at 0.5x** vs. assumptions in *Agri-wallet Performance*[2] | | | | | |
| Average net income | €1.5m | €6.1m | €9.8m | €8.1m | €0.5m |
| Total equity requirement | 3% | 3% | 3% | 17% | 122% |
| ROIC for Dodore Kenya | 2% | 3% | 6% | 12% | 2-5% for fund investors |
| Return on equity | 10% | 8% | 12% | 3% | ~7% |
| Average debt returns | | | | | |

The **managed blended finance facility** model (as discussed in *Agri-wallet Performance* section) would de-risk the business and reduce the equity requirement, thereby increasing Dodore's ROE, although we cannot determine at this stage if it will deliver increases in scale (but it may, given potential to reduce risk for investors)

1. *Scenario 5 assumes management fee of 11% of fund assets for scale at 1x, 14% fee for scale at 0.75x, and 16% for scale at 0.5x*
2. Per conversion rate assumptions used in *Agri-wallet Performance* section (e.g. 30% conversion of farmers by 2024); also see Appendix for more details

2

# Off-balance sheet funding | Assumptions for each scenario

| | On-balance sheet funding | | Master (global) SPV | | Country-level SPV | | Retail SPV | | Managed blended finance facility | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2019 | 2024 | 2019 | 2024 | 2019 | 2024 | 2019 | 2024 | 2019 | 2024 |
| **% EUR Debt** | 100% | 60% | 100% | 100% | 75% | 0% | 100% | 100% | | |
| **EUR Interest Rates** | 9% | 9% | 8% | 8% | 8% | 8% | 3% | 3% | Management fee of 11% of assets and flat ~€100k p.a., plus performance fee of 10% of profits above hurdle rate (8% IRR) | |
| **KES Interest Rates** | 14% | 14% | 14% | 14% | 14% | 12% | 14% | 14% | | |
| **Debt:equity ratio** | 1.5 | 4.0 | 1.5 | 5.0 | 1.5 | 3.0 | 1.5 | 3.0 | | |
| **Liquidity (months)** | 6 | 3 | 1 | 1 | 12 | 3 | 12 | 3 | 12 | |
| **Likely scale (as shown on previous page)** | **0.75x** vs. *Agri-wallet Performance* section | | **1x** vs. *Agri-wallet Performance* section | | **0.75x** vs. *Agri-wallet Performance* section | | **0.5x** vs. *Agri-wallet Performance* section | | **1x** vs. *Agri-wallet Performance* section | |
| **Rationale on likely scale** | Assumed to reach somewhat higher scale than today, but lower than global SPV / managed facility given that model is not de-risked with off-balance sheet structure | | International funding could unlock much larger scale than reached currently – assumes that Kenya # farmers with overdraft will double then similar-scale footprint accessed in 30x other areas | | Assumed to reach somewhat lower scale than the global SPV model, as local funding could be harder to seek | | Relatively limited scale assumed given potentially low retail market appetite, and relatively untested model | | De-risking could again unlock much larger scale than current, although subject to constraints in ability to raise fund and equity investment | |

3

# **Pricing |** Doubling prices is cost-effective in aggregate as long as less than ~45% of customers leave due to the price increase

**Avg. net income *with grants* (€k), 2019-24, varying by farmer/buyer volumes & interest rate**

Current pricing  Projected pricnig[1]

## Buyers

***% volume decline in # buyers registered***
*(including loss of farmers registered through that buyer)*

| ***% p.a. buyer interest rate[1]*** | 0% | -10% | -20% | -30% | -40% | -50% |
|---|---|---|---|---|---|---|
| | 52 | -4 | -59 | -115 | -170 | -225 |
| | 167 | 100 | 33 | -35 | -102 | -166 |
| | 224 | 151 | 78 | 6 | -67 | -137 |
| | 282 | 203 | 124 | 46 | -32 | -108 |
| | 339 | 255 | 170 | 86 | 2 | -79 |
| | 397 | 306 | 215 | 126 | 37 | -49 |
| | 454 | 358 | 261 | 166 | 71 | -20 |
| | 511 | 409 | 307 | 206 | 105 | 9 |
| | 569 | 461 | 353 | 247 | 140 | 39 |
| | 626 | 512 | 398 | 287 | 174 | 68 |

## Farmers

***% volume decline in # farmers taking an overdraft***

| ***% p.a. farmer intere rate[1]*** | 0% | -10% | -20% | -30% | -40% | -50% |
|---|---|---|---|---|---|---|
| | -57 | -103 | -148 | -191 | -234 | -272 |
| | 47 | -9 | -65 | -118 | -172 | -220 |
| | 151 | 85 | 19 | -46 | -110 | -169 |
| | 256 | 179 | 102 | 27 | -48 | -117 |
| | 360 | 273 | 186 | 100 | 15 | -65 |
| | 464 | 367 | 269 | 173 | 77 | -13 |
| | 569 | 461 | 353 | 247 | 140 | 39 |
| | 673 | 554 | 436 | 320 | 203 | 91 |
| | 777 | 648 | 520 | 393 | 265 | 143 |
| | 882 | 743 | 603 | 466 | 328 | 195 |

This analysis assumes the cost of capital is held constant. However, rather than raising prices to grow, there could be an option for the business to seek more scale-constrained but cheaper sources of capital (e.g. retail markets) and therefore scale less aggressively (lower price and vols) with lower capital costs

*1. Assumed that interest rates double by 2021 vs. current rates (18% p.a. for buyers, 12% p.a. for farmers). Assumption likely to be subject to revision in internal Agri-wallet planning, given potential scope to further increase prices (further testing TBC)*

# Contents of the annex

## A KEY ASSUMPTIONS

- Key assumptions for Agri-wallet analytics
- Key assumptions for farmer analytics
- Key assumptions for VCP analytics

## B ENABLING ENVIRONMENT IN KENYA

- Agricultural enabling environment
- Environmental context
- Gender context

Go back to Agri-wallet performance analysis

# Financial projections were developed based on a combination of historical financial data and assumptions

| REVENUE INPUTS | | | | |
|---|---|---|---|---|
| BUYERS | | | | |
| | **Revenue Input** | **2019** | **2024** | **Comment / Rationale** |
| **General** | EUR / KES exchange rate | 114 | 114 | Constant rates in March 2019 (at time Agri-wallet's own planning model wlas developed); also aligns with rates in October 2019 |
| **Input Provider Credit Behaviour Inputs** | Cumulative number of buyers registered on platform | 141 | 3138 | Calculated based on AW assumed number of buyers per farmer x # farmers in SDM model |
| | Average crop cycle | 8 months | | Based on Agri-wallet assumptions |
| | Average repayment duration (months) | 5 months | | Repayment profile based on transaction data |
| | Probability of default | 6,5% | 4,3% | Based on analysis of NPL rates (discussed with Agri-wallet team) and assumed improvement due to management initiatives- Assumed to align with buyer profile |
| | Loss Given Default | 90% | 90% | |
| | Overdraft graduation rates | 1st overdraft- 80% | 1st overdraft- 80% | Based on Agri-wallet planning model although slightly more conservative on 1st overdraft graduation rate (given track record from small sample size of transaction data) |
| | | 2nd overdraft- 90% | 2nd overdraft- 90% | |
| | | 3rd overdraft- 90% | 3rd overdraft- 90% | |
| | Overdraft Size | 2nd overdraft = +100% vs. overdraft 1 | | Assumes overdraft doubles in size with each successful graduation |
| | | 3rd overdraft = +50% vs. overdraft 2 | | |
| | | 4th overdraft = +50% vs. overdraft 3 | | |
| **Other** | Annual exchange rate loss | 7.255% pa | | From projected exchange rate depreciation based on difference between short term interest rates for Kenya vs. Europe |

Go back to Agri-wallet performance analysis

# Financial projections were developed based on a combination of historical financial data and assumptions

| REVENUE INPUTS | | | | |
|---|---|---|---|---|
| FARMERS | | | | |
| | Revenue Input | 2019 | 2024 | Comment / Rationale |
| General | EUR / KES exchange rate | 114 | 114 | Based on Agri-wallet planning model |
| Farmer Credit Behaviour Inputs | % Farmers given overdraft through AW | 15% | 30% | More conservative vs. Agri-wallet assumptions; implies that the business would need to double existing footprint and find 30x footprints of similar scale |
| | Average crop cycle | 8 months | | Based on Agri-wallet assumptions |
| | Average repayment duration (months) | 12 months | | Repayment profile based on transaction data – ramp up of overdraft to 100% liability in first 2-3 months, stable for ~6 months then repayment |
| | Probability of default | 29% | 6% | Based on analysis of NPL rates (discussed with Agri-wallet team) and assumed improvement due to management initiatives |
| | Loss Given Default | 70% | 70% | |
| | Overdraft graduation rates | 1st overdraft-80% | 1st overdraft-80% | Based on Agri-wallet planning model although slightly more conservative on 1st overdraft graduation rate (given track record from small sample size of transaction data) |
| | | 2nd overdraft-90% | 2nd overdraft-90% | |
| | | 3rd overdraft-90% | 3rd overdraft-90% | |
| | Overdraft Size | 2nd overdraft = +20% vs. overdraft 1 | | Assumed to be more moderate than increases in buyer overdrafts, as increase in Agri-wallet access to capital likely to drive further roll-out to farmers, rather than larger overdrafts to existing base |
| | | 3rd overdraft = +10% vs. overdraft 2 | | |
| | | 4th overdraft = +5% vs. overdraft 3 | | |
| Other | Annual exchange rate loss | 7.255% pa | | From projected exchange rate depreciation based on difference between short term interest rates for Kenya vs. Europe |

Go back to Agri-wallet performance analysis

# Financial projections were developed based on a combination of historical financial data and assumptions

| REVENUE INPUTS | | | | |
|---|---|---|---|---|
| Input Provider | | | | |
| | Revenue Input | 2019 | 2024 | Comment / Rationale |
| Input Provider Credit Behaviour Inputs | Cumulative number of Input Providers registered on platform | 90 | 3884 | Calculated based on AW assumed number of input providers per farmer x # farmers in SDM model |
| | Average crop cycle | 8 months | | Based on Agri-wallet assumptions |
| | Average repayment duration (months) | 5 months | | Repayment profile based on transaction data for buyer and projected overdraft repayment rate for input provider |
| | Size of first overdraft | 70kKSh | 100kKSh | Size of first overdraft based on transaction data, then grown at assumed growth rate p.a. |
| | Probability of default | 6.5% | 4.3% | Based on analysis of NPL rates (discussed with Agri-wallet team) and assumed improvement due to management initiatives. Based on assumption that input providers are 1 year behind buyers- Assumed to align with input provider profile |
| | Loss Given Default | 70% | 70% | |
| | Overdraft graduation rates | 1st overdraft- 80% | 1st overdraft- 80% | Based on Agri-wallet planning model although slightly more conservative on 1st overdraft graduation rate (given track record from small sample size of transaction data) |
| | | 2nd overdraft- 90% | 2nd overdraft- 90% | |
| | | 3rd overdraft- 90% | 3rd overdraft- 90% | |
| | Overdraft Size | 2nd overdraft = +100% vs. overdraft 1 | | more conservative than AW planning model increase (of +33% for overdraft 2 and +25% for overdraft 3) assuming incremental capital likely to drive further roll out to farmers, rather than larger overdrafts to existing base |
| | | 3rd overdraft = +50% vs. overdraft 2 | | |
| | | 4th overdraft = +50% vs. overdraft 3 | | |
| Other | Annual exchange rate loss | 7.255% pa | | From projected exchange rate depreciation based on difference between short term interest rates for Kenya vs. Europe |

Go back to Agri-wallet performance analysis

# Financial projections were developed based on a combination of historical financial data and assumptions

## COST INPUTS

### Overhead allocation Inputs

| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| Allocation to Factoring (Buyers) | 43% | 43% | 47% | 39% | 33% | 33% |
| Allocation to Reverse Factoring (Farmers) | 48% | 47% | 42% | 49% | 56% | 56% |
| Allocation to Reverse Factoring (input providers) Credit Product | 4% | 6% | 9% | 8% | 8% | 8% |
| Allocation to Reverse Factoring (input providers) Transaction | 6% | 3% | 3% | 3% | 3% | 3% |
| Allocation to Factoring (Buyers) | 43% | 43% | 47% | 39% | 33% | 33% |

| | | | | | | |
|---|---|---|---|---|---|---|
| Allocation to Reverse Factoring (input providers) Credit Product | 39% | 65% | 77% | 73% | 70% | 72% |
| Allocation to Reverse Factoring (input providers) Transaction | 61% | 35% | 23% | 27% | 30% | 28% |

### General Expense Inputs

| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| Tax rate | 20.5% | 20.5% | 20.5% | 20.5% | 20.5% | 20.5% |
| VAT rate | 16% | 16% | 16% | 16% | 16% | 16% |
| VAT Factor | 86% | 86% | 86% | 86% | 86% | 86% |
| Annual exchange rate loss before diversification benefit | 7.255% | 7.255% | 7.255% | 7.255% | 7.255% | 7.255% |

Go back to Agri-wallet performance analysis

# Financial projections were developed based on a combination of historical financial data and assumptions

| COST INPUTS | | | | | | |
|---|---|---|---|---|---|---|
| **Field Staff Inputs** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** |
| Farmers per Field Officer | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 |
| Farmers per Call Centre Agent | 10000 | 10000 | 10000 | 10000 | 10000 | 10000 |
| **Transaction Expense Inputs** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** |
| Coin 22 Fee charge | 33% | 33% | 33% | 33% | 33% | 33% |
| Mobile Money Fee charge | €0.19 | €0.19 | €0.19 | €0.19 | €0.19 | €0.19 |
| **Annual Depreciation** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** |
| Vehicles | 20% | 20% | 20% | 20% | 20% | 20% |
| Office Equipment | 13% | 13% | 13% | 13% | 13% | 13% |
| Computer Equipment | 25% | 25% | 25% | 25% | 25% | 25% |
| Software | 25% | 25% | 25% | 25% | 25% | 25% |
| Phones/Tablets | 25% | 25% | 25% | 25% | 25% | 25% |
| **Overdraft Allocation** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** |
| # countries with Agri-wallet presence | 1 | 1 | 2 | 3 | 4 | 5 |
| Implied allocation to Kenya | 100% | 100% | 50% | 33% | 25% | 20% |
| Farmers per general staff | 1000000 | 1000000 | 1000000 | 1000000 | 1000000 | 1000000 |

Go back to Agri-wallet performance analysis

# Financial projections were developed based on a combination of historical financial data and assumptions

## COST INPUTS

| Cost allocation ratios for field staff and costs | Buyer | Farmer | input provider |
|---|---|---|---|
| Field officer time | 40% | 30% | 30% |
| Call centre agent time | 0% | 90% | 10% |
| Data analyst time | 33% | 33% | 33% |
| BDO | 100% | 0% | 0% |
| Agent time | 0% | 100% | 0% |
| CFO | 33% | 33% | 33% |
| Head of Sales/Business Development Manager time | 33% | 33% | 33% |
| Project Manager time | 40% | 30% | 30% |
| ICT Manager time | 33% | 33% | 33% |
| Operations Manager (Head of Credit) time | 33% | 33% | 33% |
| Compliance Manager time | 33% | 33% | 33% |
| Portfolio Manager time | 33% | 33% | 33% |
| Customer Service Office, IT & Communication time | 0% | 90% | 10% |
| Field Officer Travel and Accommodation | 40% | 30% | 30% |
| Hardware, Software, Platform and IT time | 33% | 33% | 33% |

Go back to VCP performance analysis

# VCP Performance | Assumptions – Input Providers

| | Data requested | Assumption | Source / Comment |
|---|---|---|---|
| **Baseline Input Provider Revenue** | Number of farmer customers | 300 | Based on previous SDM projects. This number is held constant over time to isolate for the effect of Agri-wallet customers. |
| | Average yearly spend on inputs, potato and dairy farmer | ~25,000 KSh | Based on the baseline segment of AKVO primary data. This figure includes spend on fertilizer, seeds, agrochemicals, dairy fodder and medicines for livestock. Cost categories used by under 10% of farmers (e.g. water for irrigation, seedlings), were excluded. |
| | Unit margin on low-quality products (Low-quality dairy feed, uncertified seeds, etc.) | 10% | Based on previous SDM projects and Input Provider interviews, Input providers earn lower margins on low quality products. |
| | Unit margins on high-quality products (high-quality feed, certified seeds, etc.) | 20% | Based on previous SDM projects and Input Provider interviews, input providers earn higher margins on higher value products. |
| **Baseline Input provider costs** | Yearly staff salaries | 240,000 KSh | Based on previous SDM projects, Input Providers employ 2 fulltime staff at a salary of 120,000 KSh yearly. |
| | Warehousing costs | 36,500 | Based on previous SDM projects, electricity, storage and other warehousing costs amount to 36,500 yearly |
| **Uplift assumptions** | Agri-wallet farmers who are new customers to the input provider | 100% | Agri-wallet farmers consolidate all their input purchases to Input Providers accepting Agri-wallet credit. Farmer and Input Provider interviewed revealed that Agri-wallet customers are mostly new customers to the Input Provider. |
| | Additional spend by Agri-wallet customers at registered input providers | 10,000KSh – 20,000 Ksh | Based on the average size of farmer overdrafts. Primary data validated the assumption that additional spend roughly is equivalent to the size of the farmer overdraft. |
| | Agri-wallet farmers switching to higher quality products (improved dairy feed, certified seeds, etc) | 50% | Based on farmer interviews, the primary change enabled by AW overdraft is to purchase higher quality inputs, which enable higher yield. |

Go back to VCP performance analysis

# VCP Performance | Assumptions – Buyers

| | Data requested | Assumption | Source / Comment |
|---|---|---|---|
| **Baseline Buyer Revenue** | Number of farmer purchasing from | 700 | Data from Agri-wallet farmer market survey. However, farmers do not sell 100% of their input to a single buyer. |
| | Share of farmer's total yield being sold to buyer – dairy | 50% | Farmer and buyer interviews revealed that farmers sell milk produced in the mornings to a buyer, and afternoon milk to local markets |
| | Share of farmer's total yield being sold to buyer – potato | 35% | Farmer and buyer interviews revealed that the potato value chain is highly unstructured and farmers have a number of buyers |
| | Share of farmer's total yield being sols to buyer – tomato | 20% | Farmer and buyer interviews revealed that only 1/5 of tomatoes are sold for export, the remainder sold to local markets. |
| | Unit margin on dairy products | 6 KSh / Kg | Margin based on buyer interviews, after COGS and transport costs |
| | Unit margin on potatoes | 6 KSh / Kg | Margin based on buyer interviews, after COGS and transport costs |
| | Unit margins on tomatoes | 8 KSh / Kg | Margin based on buyer interviews, after COGS and transport costs |
| **Baseline Input provider costs** | Yearly staff salaries | 1,800,000 KSh | Based on buyer interviews and previous SDM projects; buyers employ on average 5 fulltime staff at a salary of 120,000 KSh yearly, and up to 20 part-time workers, for up to 50% of the year. |
| | Transport costs | 4 KSh / Kg | Buyer pay transporters a commission of ~4 KSh / Kg for transporting goods. |
| **Uplift assumptions** | Percent of AW farmers who are new to the buyers | 10-30% | Buyers initially shift existing farmers to AW, particularly unbanked, small-scale (<1 acre) farmers, and those that might otherwise be lost to competition. Over time, they use AW to attract additional farmers. Some prefer payment in cash. |
| | Percent of the yield uplift sold to buyers | 15%-30% | Calculated due to capital constraints on the buyers |
| | Yield uplift for dairy AW farmers with overdraft | 30-50% | Based on AKVO primary data. Dairy farmers cited up to a 100% uplift from 5-10 liters daily, although not all produce is sold to a buyer. |
| | Yield uplift for dairy AW farmers with overdraft | 80-120% | Based on AKVO primary data. Potato farmer cited up to a 100% uplift in product, from 4 to 8 tons per acre. |
| | Yield uplift with AW farmers saving without overdraft | 10% of overdraft uplift | The transaction database shows that saving farmers spend on inputs 10% the increase of overdraft farmers, and hence see 10% the uplift. |

Go back to VCP performance analysis

# Farmer Performance | Assumptions – Farmers

| | Data requested | Assumption | Source / Comment |
|---|---|---|---|
| **Farmer Buyer Revenue** | Average size of land for potatoes | 1.25 acres | AKVO primary data |
| | Average size of land for tomatoes | 0.5 | AKVO primary data |
| | Number of potato seasons | 2 | AKVO primary data, farmer interviews |
| | Number of tomato seasons | 3 | AKVO primary data, farmer interviews |
| | Yield of potatoes per acre | 2300 | AKVO primary data, farmer interviews |
| | Yield of tomatoes per acre | 1750 | AKVO primary data, farmer interviews |
| | % of potatoes lost or for self-consumption | 25% | AKVO primary data |
| | % tomatoes lost of for self-consumption | 30% | AKVO primary data |
| | Average price, potatoes | 18 KSh/kg | AKVO primary data (lower than stated in farmer interviews) |
| | Average price, tomatoes | 38 KSh/kg | AKVO primary data (lower than stated in farmer interviews) |
| | Liters of milk sold per month | 315 | AKVO primary data, farmer interviews |
| | Average price, milk | 30 KSh | AKVO primary data (lower than stated in farmer interviews) |
| | Revenue from other crop sources | 40,000 KSh | AKVO primary data |
| **Baseline Farmer costs** | Total labour costs | 11,680 KSh | AKVO primary data, including casual labor for land preparation, planting, crop maintenance, irrigation, input application, trench digging. |
| | Total equipment costs (potatoes, tomatoes) | 4000-5700 | AKVO primary data, including renting or owning equipment for land preparation (animal traction/tractors), irrigation, wedding and spraying. |
| | Total input costs (potatoes, tomatoes) | 26,000-43,000 | AKVO primary data, including seeds, fertilizer, agrochemicals, dairy fodder, medicine for livestock. In line with farmer interviews, |
| **Uplift assumptions** | Yield uplift for overdraft farmers, milk | 30%-50% | AKVO primary data, farmer interviews |
| | Yield uplift for overdraft farmers, potatoes | 77-120% | AKVO primary data, farmer interviews |
| | Yield uplift for overdraft farmers, tomatoes | 40-70% | AKVO primary data, farmer interviews |
| | Yield uplift for savings farmers | 10% of above | Based on size of transactions on inputs in the transaction database, amounting to 10% the additional spend from farmers |
| | Percent of overdraft spent on input | 100% | AKVO primary data, confirmed by transaction database |

# Opportunities and challenges in the enabling environment

| | Definition | Opportunities and challenges | Impact on SDM | Measures taken by Agri-wallet |
|---|---|---|---|---|
| Governance | **LAND OWNERSHIP** Existence of land ownership rights / regulations and their enforcement. Ease of purchasing/ transferring land | 77% of Agri-wallet farmers surveyed own land, are typically smallholders with a limited number of smallholders having title deeds and so not able to use land as a collateral. In rural communities, it is easy to lease land. | ▼ | Agri-wallet does not include measures related to land ownership at present. |
| Governance | **INFRASTRUCTURE** Existence and state of roads, water and electricity networks as well as proximity to main trading / processing hubs (e.g. access to market) | Only 11% of Kenya's roads are paved and transport is expensive. Poor infrastructure contributes to already high post-harvest loss levels, which can negatively impact ability for farmers and buyers to deliver on contracts. | ▼▼ | Agri-wallet works better with buyers that are closely tied to farmers e.g. via transporters, but no direct involvement in infrastructure currently. |
| Farm Inputs | **LABOR** Cultural norms that restrict /promote people of certain ages, genders or social groups from farm labor. Availability and cost of labor | Few smallholder farmers have access to mechanization and depend on hired labor during peaks in the season. 57% of Agri-wallet farmers surveyed used hired labour on their farm, rather than family labour. | - | Agri-wallet does not include measures directly related to labour at present (although input usage may affect labour required). |
| Farm Inputs | **INPUTS & FINANCING** Availability of affordable, quality inputs and the necessary marketing and distribution mechanisms. Availability of credit. Enabling regulatory environment | A lack of high quality agriculture inputs, limited farmer knowledge on input requirements, and a lack of financing to facilitate access contributes to lower average yields. Certified seed is a critical bottleneck which is subject to shortages. | ▼ | Agri-wallet facilitates access to higher inputs for farmers by providing easy-to-access overdrafts, in some cases accompanied with agronomy advice on correct input use. |
| Crop | **TRADING SYSTEM** Organization of the system through which crops are traded from farmer to market, including the number and type of actors involved | There is a lack of competition in local markets which makes farmers dependent on middlemen to access markets. Side-selling by farmers also poses a challenge, especially with varying price levels. | ▼ | Agri-wallet acts as an intermediary player to strengthen linkages in the supply chain and cut out layers of brokers who squeeze farm-gate prices. |
| Crop | **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 | Price volatility is a major challenge throughout the supply chain, with prices fluctuating enormously between the high and low seasons and often a driver of side-selling. | ▼▼ | Agri-wallet market linkage service uses prices agreed between farmers and buyers; however, the model faces major challenges from selling. |
| Sustainability | **ENVIRONMENTAL RISKS** Climate change, possibility of extreme weather, soil type, water supply and quality, pests and diseases. Potential environmental damages such as deforestation | Yields are declining due to changing rainfall patterns, poor soil fertility, and crop diseases which have affected key VCs (e.g. potatoes) and is intensifying due to lack of crop rotation and seed re-use. | ▼ | Agri-wallet provides insurance that can help farmers mitigate the impact of environmental risks. Inputs accessed with Agri-wallet can also improve client resilience. |
| Sustainability | **SOCIAL CONTEXT** Availability and quality of schooling / healthcare. Cultural factors. Potential social externalities like child labor, gender disparity | Typically much higher involvement in some key VCs amongst men than women (e.g. 72% of those involved in potato sector are men), with higher rates of uptake of financial services (e.g. bank or mobile money accounts) amongst men. | TBC | Agri-wallet does not include measures directly related to gender at present, although the product appeals across genders. |

# **Environmental resilience |** Environmental resilience of farmers in Kenya, and in the SDM

| Indicator | Discussion |
|---|---|
| **Climate resilience** | **Kenya is ranked #150**<br>out of 181 countries for climate resilience[1] |

Kenya has high vulnerability to climate change (32nd most vulnerable country), with low readiness to adapt (40th least ready country). 100% of Agri-wallet farmers had experienced crop losses from extreme weather events in the last 5 years, incl. 76% from changing rain patterns, 52% from cold waves / frost, and 42% from droughts.

1. ND-GAIN Country Index; summarizes a country's vulnerability and readiness to adapt to the negative impact of climate change (2017 data, released 2019)
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. Based on primary data collection

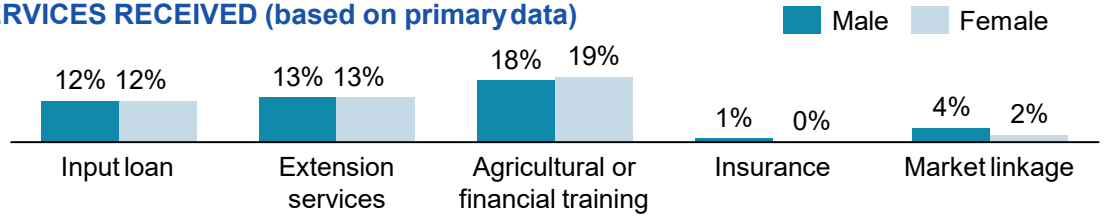
# **Know your customer** | Understanding the profile of an average Agri-wallet farmer

**AGE** 46

**EDUCATION** Primary school completed

**LOCATION** Keringet, Kenya

## SERVICES RECEIVED (based on primary data)




## FARM

- **Ownership:** Owns land
- **Farm size:** 3.65 acres (of which potatoes: 1.25 acres / 35% of land)
- **Other crops:** Grows diversified crops, mainly maize, beans, peas, cabbage.
- **Animals:** Owes an average of 3 cows for milk, and some other animals (chickens, goats).

## FINANCIAL & DIGITAL BEHAVIOUR

- **Phone**: 90% have a basic phone, of which 40% have a smart phone.
- **Mobile money:** 80% have Mobile Money
- **Bank account:** 60% have a bank account
- **overdraft:** 35% borrow money in cash or MM

## FARM ACTIVITY

- **Equipment:** Uses land preparation tools (30% animal traction, 35% tractors), tools for weeding (75%) and pesticide spraying (45%)
- **Inputs:** Primarily seeds, fertiliser and pesticide. Low use of other agrochemicals.
- **Labor:** Some casual labour support, primarily for land preparation and planning. Limited support in harvesting and post-harvesting.

## POTATO PRODUCTION (example)

- **Seasons:** Two seasons per year
- **Production:** Producing around 2300 KGs per 1.3 ages, each season. 75% of product sold.
- **Losses**: 5% of total production
- **Own consumption:** 20% of total production
- **Sales:** average of 18 KSh/kg

## MULTIPLE REVENUE SOURCES

| Source | KSh |
|---|---|
| Potatoes | 75,000 |
| Dairy | 95,000 |
| Other crops | 40,000 |
| Non-agri | 80,000 |
| TOTAL | 290,000 |

## CLIMATE RESILIENCE

- **Risks:** Changing rain patterns, cold waves (incl. frost) and droughts are the most commonly faced.
- **Mitigation:** ~50% of farmers have mitigation measures, primarily drawing on savings (usually in mobile money accounts) and good agricultural practices.

Implications for Agri-wallet

- Few farmers currently receive services, creating significant need for these. Men and women have similar uptake of services.
- Most farmers are mix-value chain farmers, and hence will see uplift benefits from improved inputs across multiple crops. Agri-wallet could partner with buyers across several value chains to full digitize farmer's payments.
- The vast majority of farmers have phones and mobile money accounts, and hence can easily use the Agri-wallet service. Limited smartphone ownership means an SMS-based service is the best solution.

# **Know your customer** | Average farmer households share decision making and farm activity, but household labor is female

**HH SIZE** 5 people

**HEAD OF HH** Male

**LOCATION** Keringet

## HOUSEHOLD ACTIVITY

**Activities:**

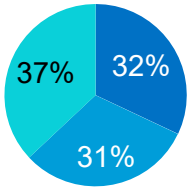
- 97% of women lead household activities (cooking, leaning, washing, fetching water)
- 70% care for school age children
- 67% buy clothing

## FARM ACTIVITY

**Activities:**

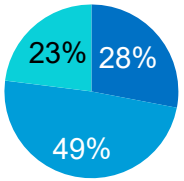
- 87% of women are involved in land prep
- 56% involved in planting
- 82% involved in crop maintenance
- 34% involved in crop protection
- 71% harvesting

**Household decision making*:**



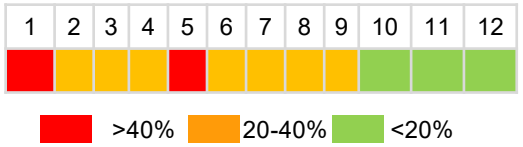

Woman Men Joint

**Productive decision making*:**




## CASH FLOW[1]

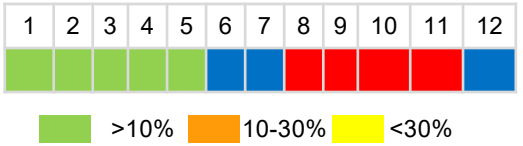
**52%** of farmers experienced cash shortages in the last 12 months




Farmers are most cash-strapped May-July

## FOOD SECURITY

**15%** of farmers experienced food shortages in the last 12 months




Farmers are must vulnerable August-November

Implications for Agri-wallet:

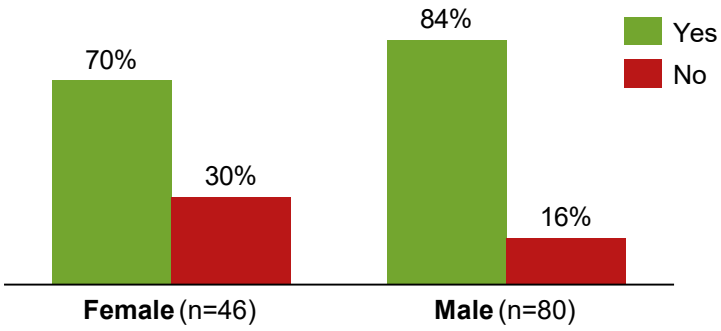
- Cash flow is directly related to the dry season and the start of the first potato season (March). Smoothing input spends through long overdraft repayments would ease cash-poverty in these months.
- Women are heavily involved in all aspects of production, except sprayers/agrichemicals. They not only do the work, but also very involved in decision making.
- Despite involvement in productive work, women still lead the vast majority of household work.

1 Overall cash flow, including revenue and costs from SDM crops, other crop sources and non-farm activities, as stated by farmers in primary data.

Study by Mastercard Foundation RAF Learning Lab, IDH, ISF, Mercy Corps AFA and Dalberg

# **Farmer satisfaction & gender** | Farmer satisfaction is somewhat higher amongst men although reasons to use the product are similar

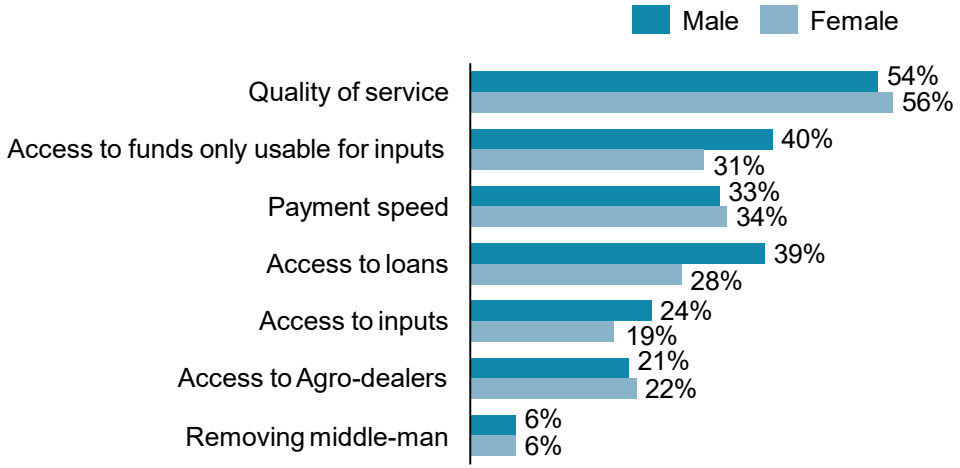
**Would you recommend Agri-wallet?**




**Implications for Agri-wallet**

- On average, both men and women are mostly satisfied with Agri-wallet, with **men likely to recommend the service** by 14%pts**.** There is room to improve customer care for female projects.
- The appeal of Agri-wallet is very **similar between men and women**. Both value good service and access to overdrafts / other services are primary motivations to recommend the service, but the business model doesn't necessarily address middle-men or improved access to agro-vets and inputs.
- **Women see slightly higher concerns with unclear charges**, indicating the need for additional gender-targeting training and information.

**Reasons for recommending AW to other farmers**
*% of those who recommended AW (n=99)*




**Reasons for not recommending AW to other farmers**
*% of those who recommended AW (n=27)*