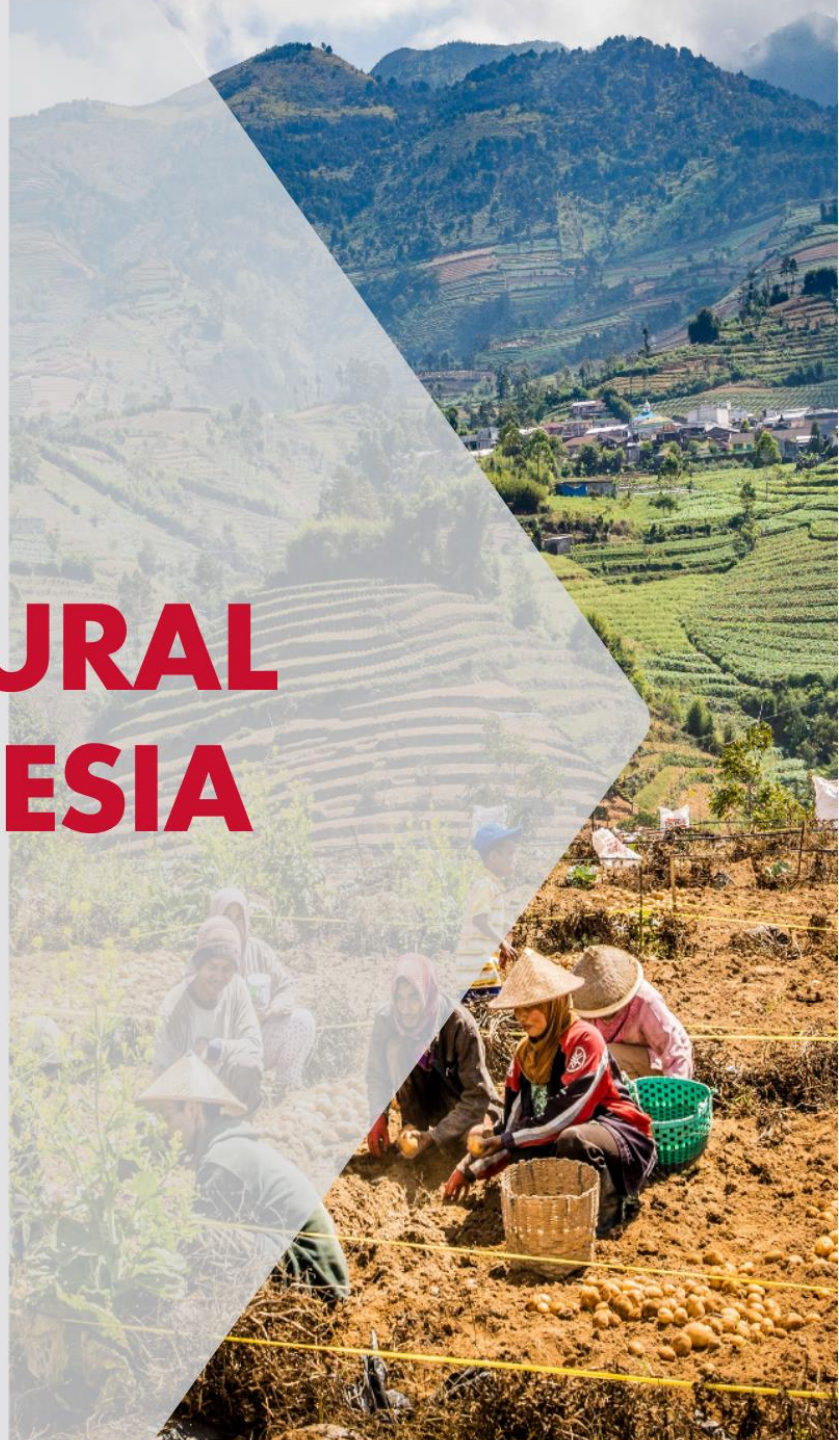
LANDSCAPING OF DIGITAL AGRICULTURAL SYSTEM OF INDONESIA

EXECUTIVE SUMMARY

NOVEMBER 2020

MERCY CORPS | AGRIFIN

Rabo Foundation



Mercy Corps AgriFin

We work with +14m farmers & over 130 partners across Africa

Mercy Corps' AgriFin is funded by the Mastercard Foundation and Bill and Melinda Gates Foundation to help organizations design, test and scale digitally-enabled services for Africa's smallholder farmers.

- Objective to develop services that increase farmer income, productivity and resilience, with 50% outreach to women.
- Work with private & public sector scale partners such as banks, mobile network operators, agribusinesses, technology innovators and governments.
- We help our partners develop bundles of digitally-enabled services, including smart farming, financial services, market access and logistics supporting data-driven partnerships.

Rabo Foundation

Active in 23 countries in Latin-America, Africa and Asia

Delivering impact on the SDGs

We work on positive change by supporting 390 organizations working with smallholder farmers

Rabo Foundation is the impact investment fund of the Rabobank Group: a leading cooperative bank focussed on Food & Agriculture.

- We partner with organisations with a direct link to smallholders, such as: producer cooperatives, agribusinesses, FinAgTech start-ups, technical assistance providers, MFI's, NGOs, governmental institutions and Rabobank & her clients
- We offer our partners access to finance (through loans and guarantees), knowledge and our network
- Our objectives are to achieve economic, social and environmental impact for smallholder farmers

We have been active in Indonesia since the early 90's, supported by our team based in Jakarta.

MERCY CORPS | AGRIFIN

Rabo Foundation

Our report has covered research and analysis of demand-side, supply-side, and the broader ecosystem

Demand side (farmers)	Capture the needs, perceptions, aspirations and behavior of farming community (including allied activities) in the context of technology and digital channels
Supply (of financial services and digital solutions)	Map the landscape of technology play in Indonesia with specific reference to agriculture covering various aspects from input to farming to harvest/post-harvest on one hand and supply of adequate formal financing solution (by various entities) including provided by fintechs for agriculture
Ecosystem for DFS in agriculture	Understand the enabling environment in terms of legal, regulatory and policy issues, financial and capital needs and market / outreach inputs
Impactful interventions by development actors / funders	Advise on the role(s) development actors / funders can undertake in the ag-tech space in Indonesia

We conducted 35 interviews with agtechs, banks, donors, government / regulators, offtakers, and farmer associations

Sinarmas	Agricultural value chain actor
Indonesian Palm Oil Association (GAPKI)	Agricultural value chain actor
GAPKINDO (Rubber Association Indoensia	Agricultural value chain actor
East West Seed Indonesia (+ SIPINDO Application)	Agricultural value chain actor
Aspekpir (Palm Oil PIR Farmers Association)	Agricultural value chain actor
SPKS (Palm Oil Swadaya Farmers Association)	Agricultural value chain actor
Wirinsinge Cooperative, West Lombok	Agricultural value chain actor
Syngenta	Agricultural value chain actor
CGAP	Development actor / donor
Embassy of the Kingdom of the Netherlands	Development actor / donor
Mercy Corps Social Ventures	Development actor / donor
UNCDF	Development actor / donor
IFAD	Development actor / donor
Syngenta Foundation	Development actor / donor
Patamar	Independent expert
BNI Bank	Traditional FSP
ACA Asuransi	Traditional FSP
BPR PD Subang (Rural Bank)	Traditional FSP

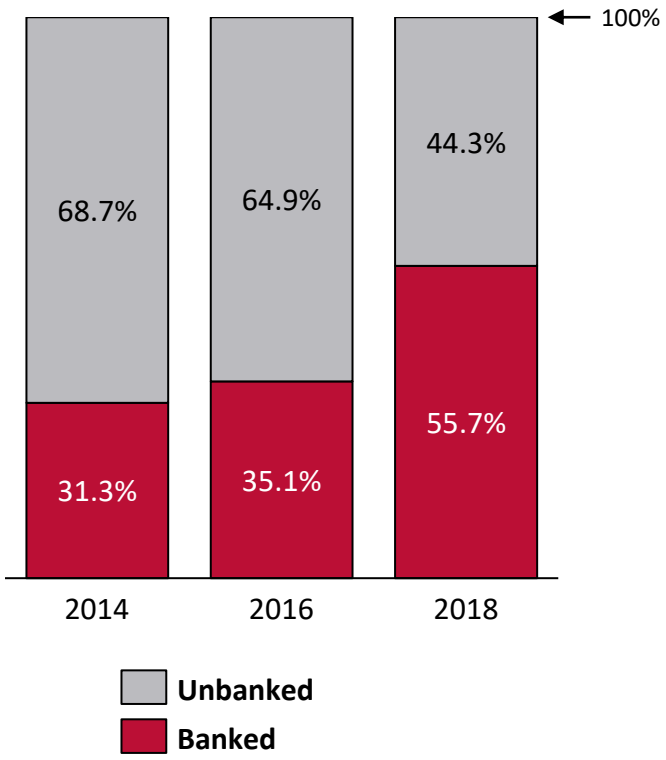
Bank Indonesia (Central Bank)	Public sector
Indonesia Financial Services Authority (OJK)	Public sector
Ministry of Agriculture	Public sector
DNKI (Financial Inclusion Secretariat)	Public sector
MSMB	Digital service provider (non-FS)
Koltiva (FarmXtension App)	Digital service provider (non-FS)
Hara	Digital service provider (non-FS)
Eden Farm	Digital service provider (non-FS)
Meridia Land	Digital service provider (non-FS)
TaniHub	Digital service provider (non-FS)
BCG Digital Ventures	Digital service provider (non-FS)
8villages	Digital service provider (non-FS)
Vasham	Digital service provider (non-FS)
iPangan	Non-traditional FSP / fintech
Crowde	Non-traditional FSP / fintech
Impact Credit	Non-traditional FSP / fintech
iGrow	Non-traditional FSP / fintech
LinkAja	Non-traditional FSP / fintech

Indonesia has made progress towards financial inclusion – particularly in rural segments where agriculture is mainstay of livelihoods

- While the formal definition of financial inclusion in Indonesia covers access to various products[1], **formal measures of financial inclusion primarily focuses around bank account ownership**
- **G2P programs have spurred account ownership** overall, with significant progress made in rural segment
- However, bank account use is often limited to receiving payments– immediately withdrawn; cash is used to facilitate consumption

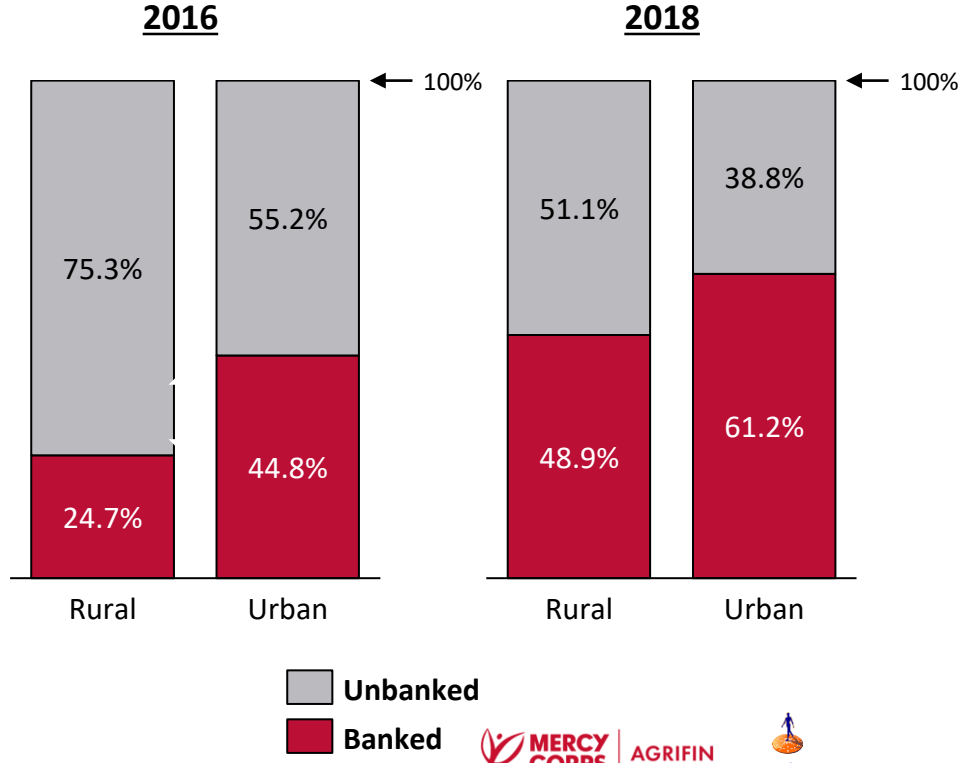
Bank account ownership - overall

% of adults



Bank account ownership – rural vs. urban

% of adults

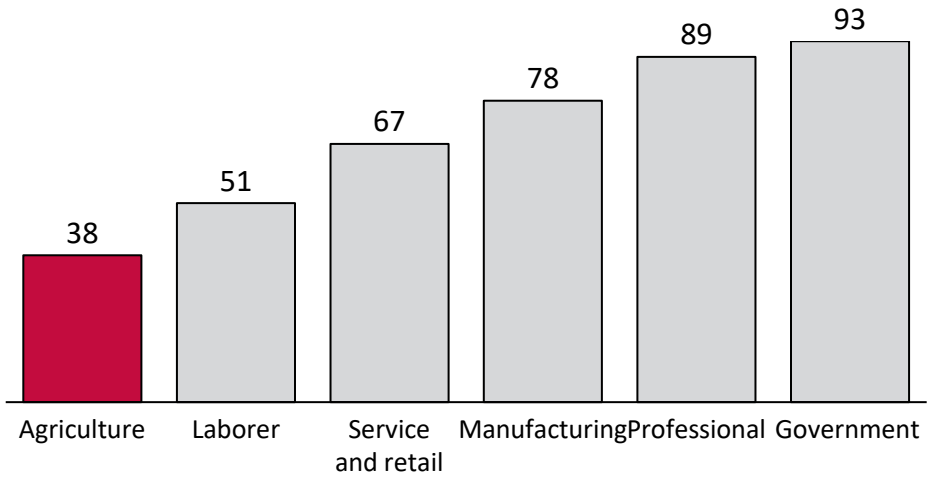


1. Financial Inclusion is the availability of access to various formal financial institution, product, and services in financial sector in accordance with the needs of the community in order to improve social welfare. (POJK No.76/POJK.07/2016) Source: National Strategy for Financial Inclusion (SNKI)

Agriculture continues to lag behind other segments in bank account ownership and access to credit

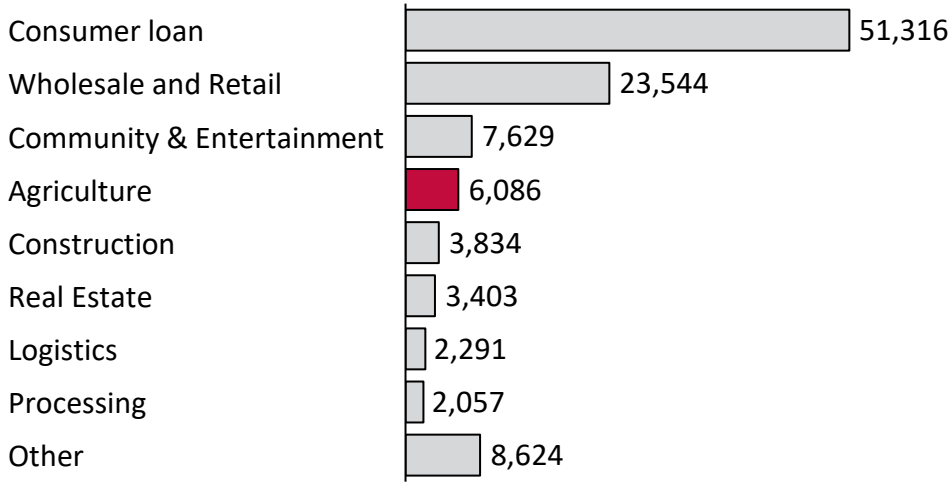
Account ownership by sector of livelihood (2018)

% of adults



Rural bank lending breakdown by sector (2019)

Bil IDR



Challenges for bank account ownership for farmers:

- Transactions in agriculture mostly still cash-based (including credit provided by traders), farmers do not require bank account to transact or obtain credit
- Large number of value chain actors, difficult to coordinate across all actors to convert to non-cash
- Lack of CICO or banking infrastructure in remote areas
- Lack of paper work (e.g., KTP (National ID), which is required for opening bank account

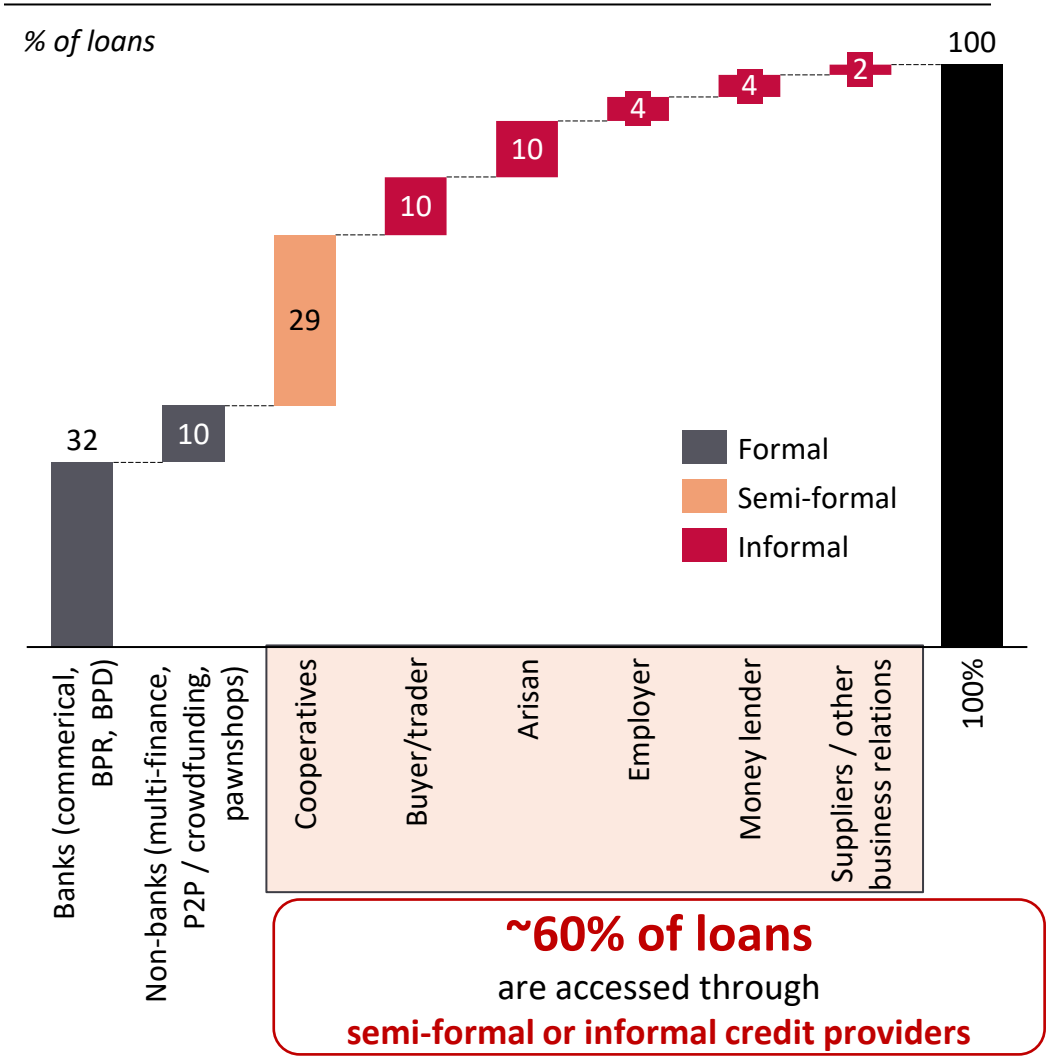
Key challenges for Agricultural lending:

- No digital / technological offering – requires specific license from OJK
- Limited knowledge in agriculture credit (and no access to data) and no particular incentive to lend to farmers
- Found that some agriculture credit used for consumption, rather than productive use
- Require strong on the ground relationships with farmers (e.g., with collectors and communities)

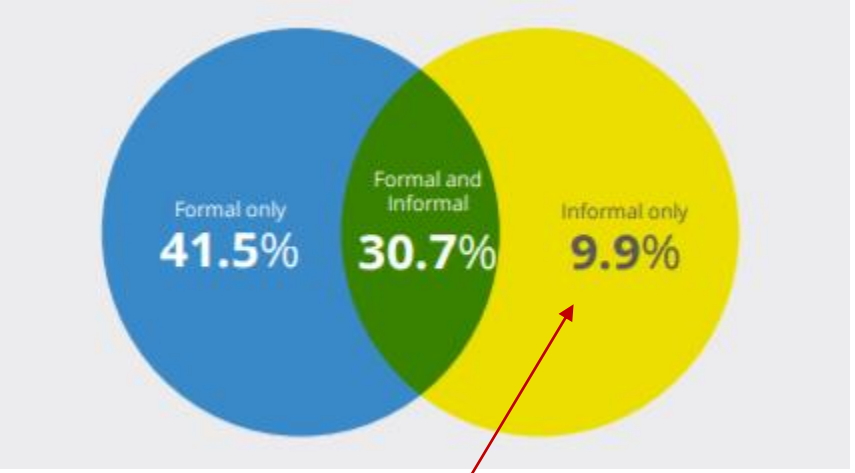
Source: SNKI (2018)

Credit is mostly sourced from semi-formal and informal sectors, even for those who have access to formal financial products

Access to loans by sources (2017)



~60% of loans
are accessed through
semi-formal or informal credit providers



Characteristics of population that access only informal services

- Rural-based
- Female
- Older than 54 years
- Have achieved SMP or lower levels of education
- Are from households in the lowest quintiles of the PPI distribution
- Involved in agriculture.

Source: Survey on Financial Inclusion and Access - Understanding people's use of financial services in Indonesia (2017)

Credit guarantee schemes (KUR) has helped to mobilize bank credit to underserved, and agriculture specifically, but more is required

Kredit Usaha Rakyat (KUR)

- Established in 2007, new KUR policy launched in 2015
- Provides credit guarantee facility to banks for lending to MSMEs and Cooperatives (UMKMK)
- Focused on productive business sectors

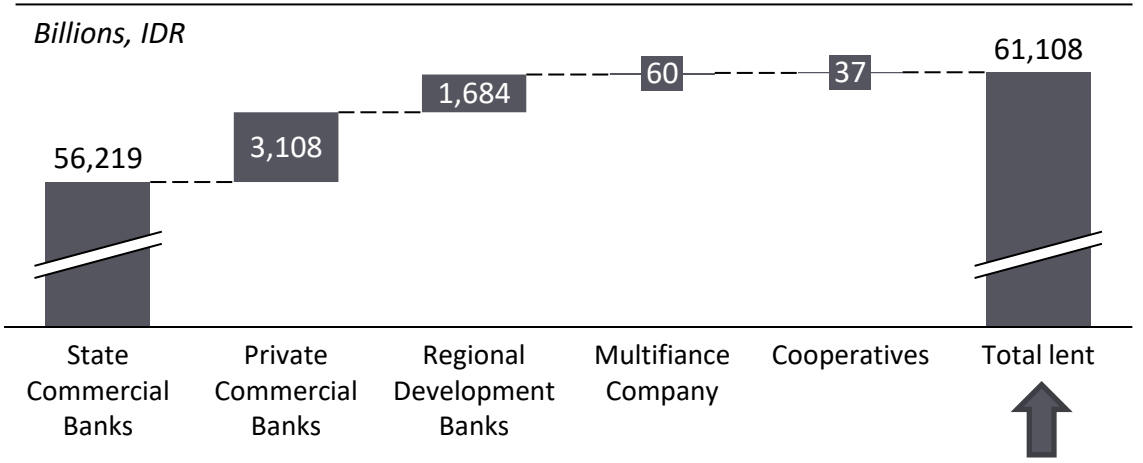
Key features

- **Risk sharing:** covers 70% of loan risk
- **Interest subsidy:** covers some cost of funding, resulting in interest rate of 6% p.a. effective interest rate

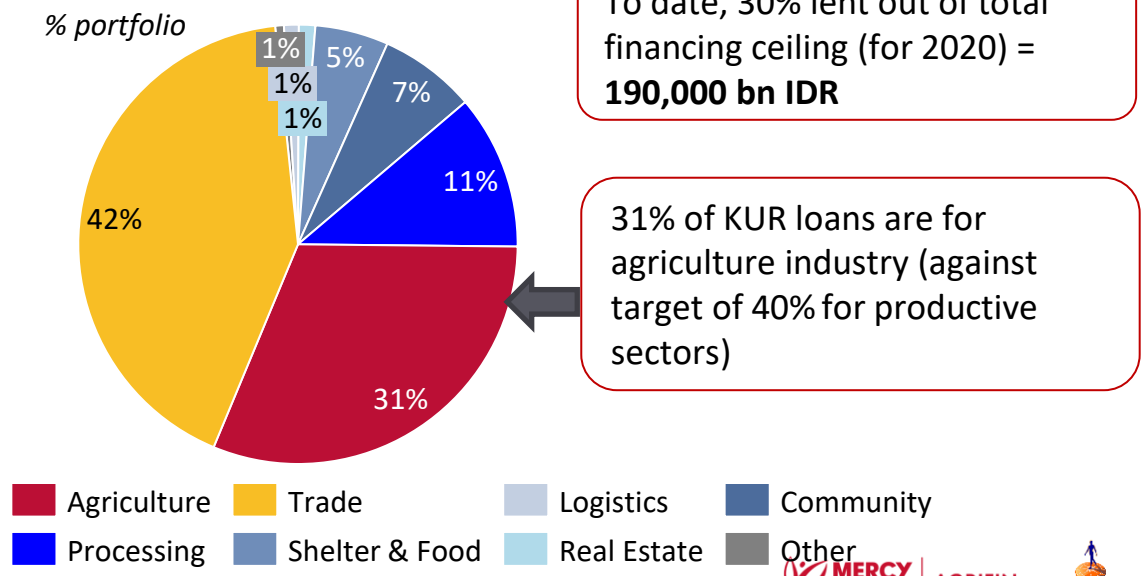
Challenges:

- Banks struggle to meet their quotas for agriculture

Kredit Usaha Rakyat (KUR)



To date, 30% lent out of total financing ceiling (for 2020) = **190,000 bn IDR**



31% of KUR loans are for agriculture industry (against target of 40% for productive sectors)

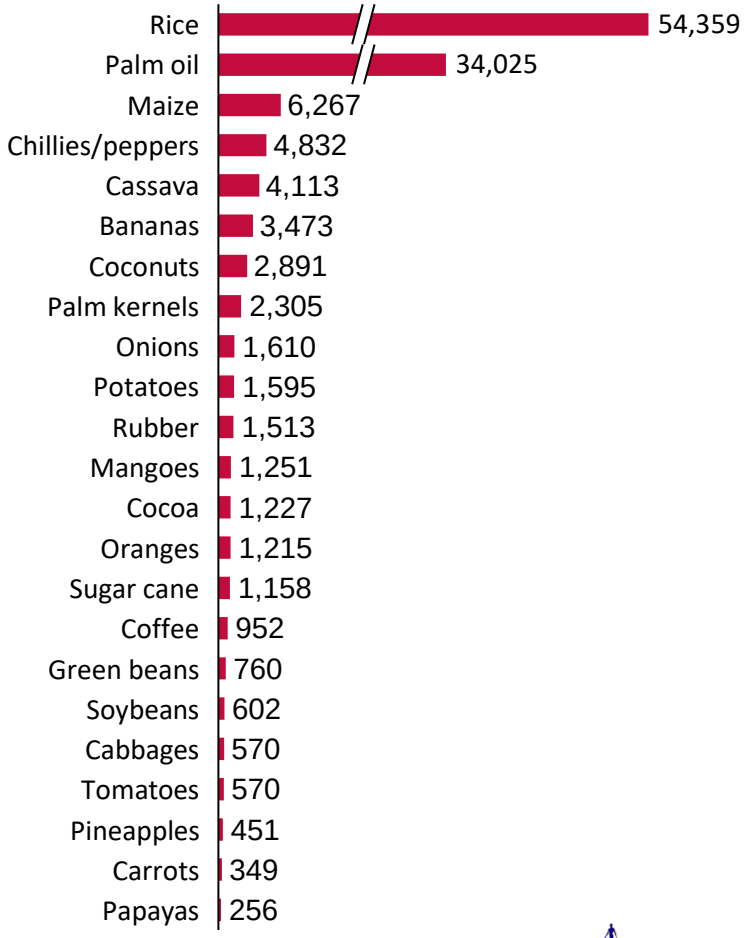
Source: Kredit Usaha Rakyat (KUR website), Coordinating Ministry of Economic Affairs (https://kur.ekon.go.id/realisasi_kur/2020/4)

Crops are dominated by palm oil, rice, and maize, together comprising 74% of all output; the top 7 crops by production make up 90% of total value

Top crops by production (2018), MT billions

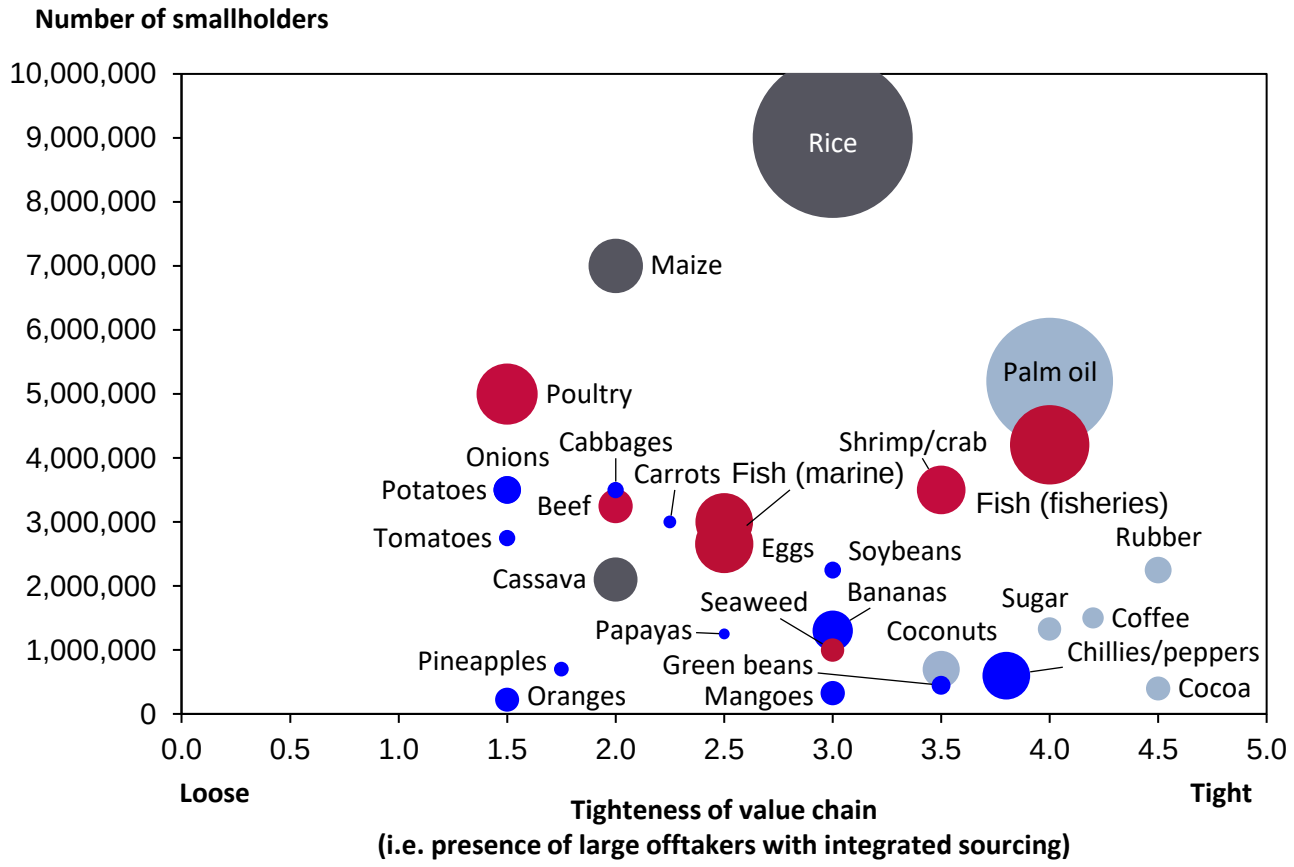
		10-year CAGR (2009-2018)
155.83	Palm oil	2.79%
83.04	Rice	2.86%
30.84	Maize	6.18%
21.74	Sugar cane	-2.13%
18.56	Coconuts	-0.26%
16.12	Cassava	-3.42%
10.33	Palm kernels	8.09%
7.26	Bananas	1.46%
3.85	Potatoes	4.51%
3.63	Rubber	2.05%
3.08	Mangoes	6.65%
2.54	Chillies/peppers	1.83%
2.51	Oranges	-1.44%
1.81	Pineapples	1.65%
1.50	Onions	5.05%
1.41	Cabbages	0.40%
0.98	Tomatoes	1.52%
0.95	Soybeans	-0.24%
0.94	Green beans	0.67%
0.89	Papayas	1.55%
0.72	Coffee	0.63%
0.64	Carrots	6.61%
0.59	Cocoa	-3.38%

Top crops by value (2018), USD 000's millions



Sources: FAOStat

We mapped out the top c.20 value chains by production size, number of smallholder farmers, and tightness of value chain



Tightness of value chain:

- Determined by level of formal procurement in sector.
- Where there are large offtakers who enter into formal relations with farmers, a value chain is considered tightly structured.
- The presence of offtakers provides greater certainty and support to farmers, crowidng in input firms and finance providers.
- Some value chains (e.g. fish, poultry) have part of value chain which is highly structured (outgrower/contract relationships), yet majority of farmers are independent and unstructured.

Legend

Size of bubble represents 2018 production value (USD)

Cash crop

Staple crop

Livestock / fish

Horticulture

Sources: (1) Ministry of Agriculture statistics (2) FAOStat (3) Interviews (4) Value chain studies

The structure of these value chains has impact on smallholder farmers, and the viability of reaching them with digital services

	Importance to small farmers	Importance to food/economy	Tight / loose?	Key export?	Economic outlook
Palm oil		Very high	Very tight	Yes	**Strong** (steady output and exports)
Rice		Very high	Loose	No, but potential	**Medium** (import protections)
Maize		Very high	Loose	No	**Medium** (imports to fill deficit)
Coconut		Medium	Mixed	Yes	**Medium** (stagnant output)
Poultry / eggs		Very high	Loose	No	**Strong** (rapid increasing demand)
Fish		Very high	Mixed	Yes	**Strong** (surging exports)
Coffee		High	Tight	Yes	**Medium to low** (flagging exports)
Cocoa		High	Tight	Yes	**Medium** (stagnant output)
Rubber		High	Very tight	Yes	**Medium to strong** (steady gains)
Mangoes		Medium	Mixed	No, but potential	**Strong** (rising output, exports)
Pineapples		Medium	Mixed	Yes	**Medium** (flat output, exports)
Chilis /peppers		Medium	Mixed	Yes	**Strong** (tapping export potential)
Tomatoes		Medium	Loose	No	**Medium** (steady output)
Potatoes		Medium	Loose	No	**Medium** (steady output)
Cassava		Medium	Loose	No	**Low** (declining output, imports up)
Sugar		High	Tight	Yes	**Low** (low productivity)
Beef		Medium	Loose	No	**Medium** (increasing demand)
Bananas		High	Mixed	No, but potential	**Medium** (flat output)

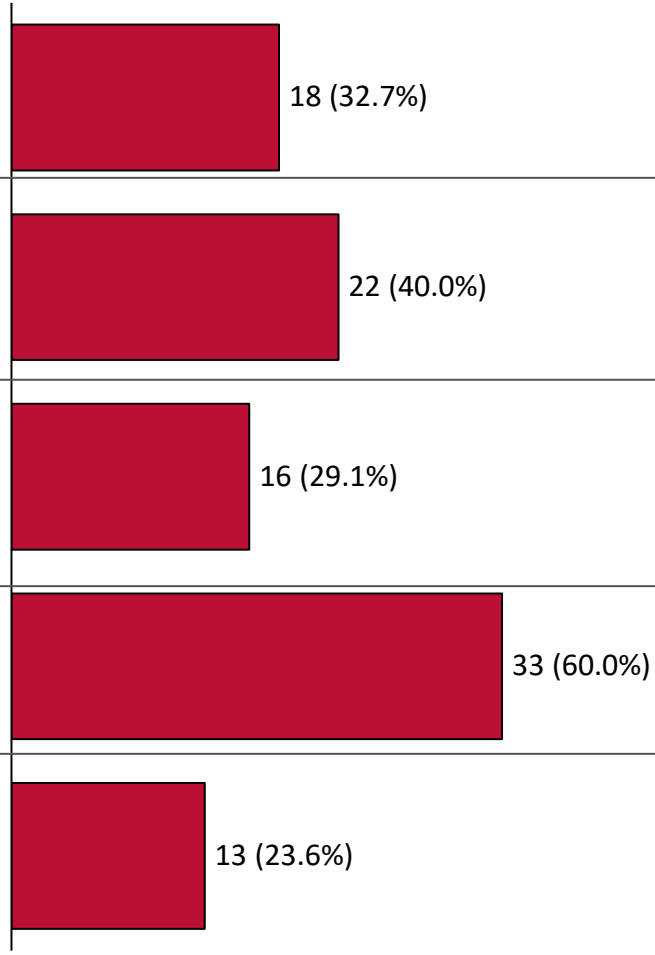
We identify four main categories of value chains which present varying levels / types of opportunities for digital services and impact

	Summary	Prime examples	Viability for digital services?	Impact potential?
1. Plantation crop value chains	Value chains with finite set of large buyers/trading houses; farmers either work directly with buyers in schemes, or via traders	Palm oil, rubber, cocoa, coconut, coffee	***Easier to serve:*** *can partner with estates for market entry; more secure cashflows; more de-risked for FSPs*	***Medium:*** *Many farmers already served by offtakers/donors; have more stable livelihoods*
2. Large but loose value chains of national importance	Significant value chains in terms of size and important to food security for fast-growing population	Shrimp, fish, maize, rice, soybeans, poultry, eggs	***Harder to serve:*** *high costs of customer acquisition; volatile cashflows; higher perceived credit risk*	***High:*** *Many farmers are sub-commercial; play critical role for national food security*
3. Small-to-medium premium / export value chains	Higher-value crops with export potential and presence of premium offtakers	Chilies, mangos, avocados, green beans, garlic, spices, ginger, seaweed	***Easier to serve:*** *farmers are higher income, more commercial; can partner with premium offtakers*	***Low-to-medium:*** *Low-hanging fruit for intervention; farmers are more commercial, can invest*
4. Horticulture and staple crops (i.e. fast-moving, high demand)	Food crops which are grown across country in large volumes for domestic market	Rice, cassava, tomatoes, potatoes, onions, cabbages	***Mixed bag:*** *less formal value chain, but crops are prevalent so lowers transaction costs*	***Medium-to-high:*** *high variance in farmer profile; crops are critical for domestic consumption*

We identified 55 agriculture-specific digital solutions in Indonesia across 5 key areas

SHF digital service providers across key product / service areas

# of digital solutions



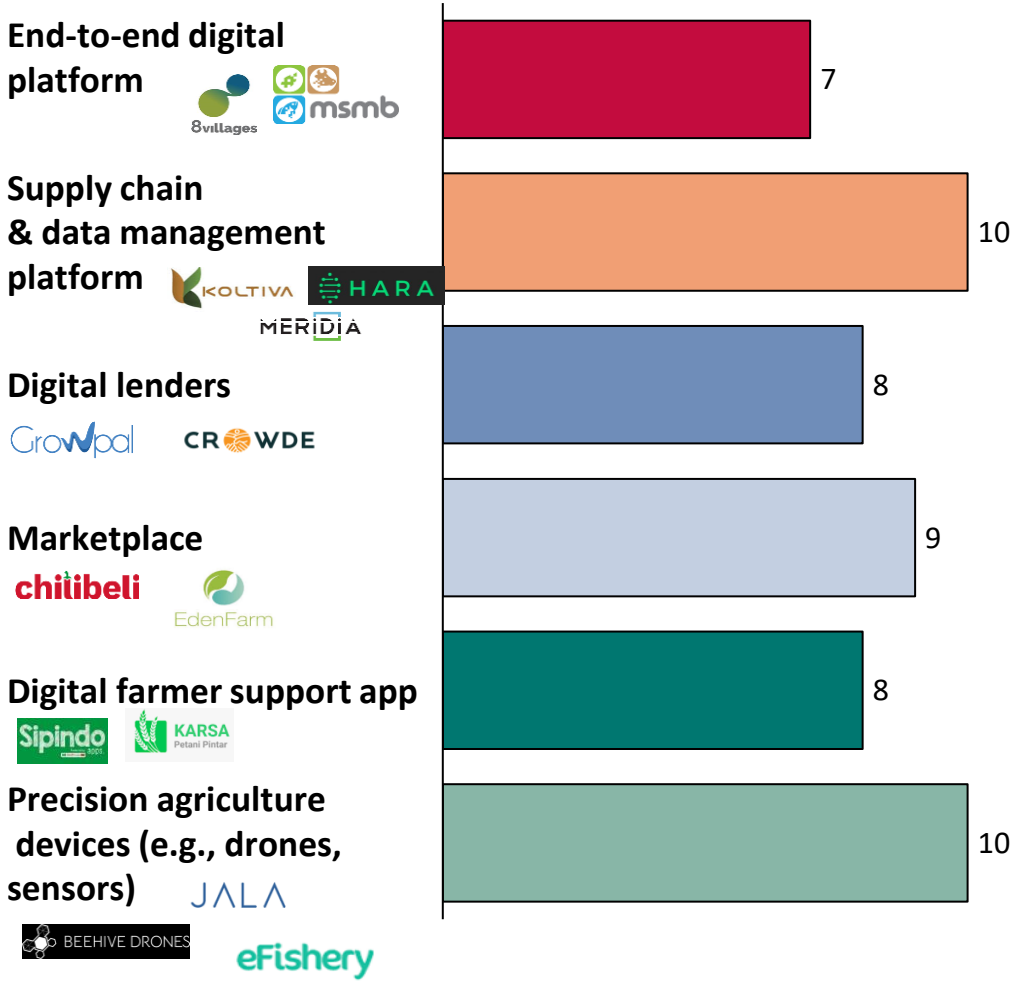
Supply chain & Data management	• Traceability and certification systems • Digital ID / farm data digitalization • Supply chain management
Market access	• E-commerce platform • Offtaker matching & aggregation • Warehousing, delivery & logistics • Trading platform for Ag inputs
Digital financial services	• Digital payments / e-wallet • Digital lending / crowdfunding platforms • Savings • Micro-insurance
Digital information	• Farm / inventory management tools • Market / price information • Agronomy advisory (e.g. chatbot, digital content)
Precision agriculture	• Drone, aerial & satellite (remote technology) • On-site technology (soil / temperature sensors) • Farm-level mechanization / input technology

Note: Sum of # of digital players across different solutions do not add up to total number of players reviewed, given many players provide several different types of services across different areas. Source: Analysis based on stakeholder interviews & company websites

We can classify players into 6 archetypes based on business model and their primary focus area

SHF digital service providers by Archetypes

# of digital solutions



Key findings:

- The 55 digital solutions have a **fairly equal spread** (7-10 companies) across each archetype
- Because many of the companies are still at early stages and have not yet achieved scale, there is some **competitive tension across key players** – few of them are open to partnering with one another
- We see potential in business models **that foster partnerships across key players** that focus on different sets of services, such as the data platform provided by HARA *(see case study in supply chain & data management section)*

Source: Analysis based on stakeholder interviews & company websites

Value chain is an important driver for type of digital solutions offered to SHFs

Archetypes / Value chain	Plantation / Cash Crops	Food Crops	Horticulture	Livestock & dairy	Fisheries	No data[2]
End-to-end digital platform	0	5	3	2	2	0
Supply chain & data management platform	7	2	2	0	0	3
Digital lenders	0	2	3	2	4	0
Marketplace	1	1	6	2	5	1
Digital farmer support app	1	3	2	0	0	4
Precision Ag	1	1	2	1	3	5

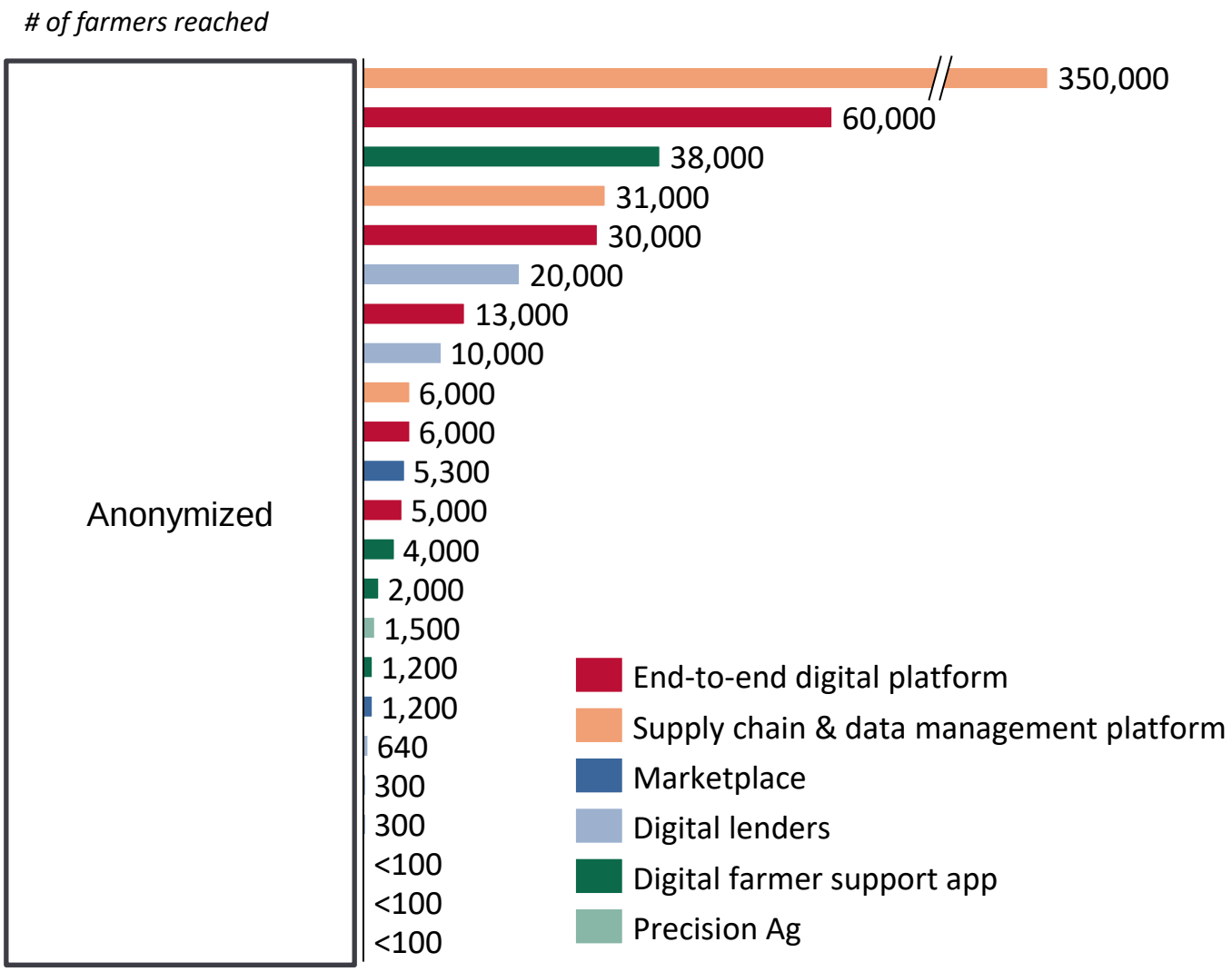
Key takeaways:

1. High number of **supply chain and data management platforms in plantation crops** given requirement for **certification, traceability** and farmer information tracking requirements by large agribusinesses
2. Many players **end-to-end service providers** operate across **food crops, horticulture & livestock** value chains at once. Most start in food crops before expanding to others.
3. **Online marketplaces** are becoming increasingly popular for **horticultural & fisheries value chain** given increasing demand from consumers to purchase high quality / premium produce directly from farmers ("farm to table")[1]
4. Players that operate in the **fisheries value chain** tend to be **exclusively focused** on fisheries. There has been a rising trend of **P2P lending / crowdfunding platforms** in this space.

Note: 1) companies that solely provide grocery deliveries (no linkages to farmers), were ignored from this analysis. 2) No data on specific value chains for many digital farmer support apps & precision agriculture technology – either value chain agnostic or limited information available
Source: Analysis based on company website data & stakeholder interviews

Many solutions are still in early stage with less than 10,000 users; supply chain, data & end-to-end platforms have acquired more users than others

Indicative scale of digital service providers (numbers estimated)

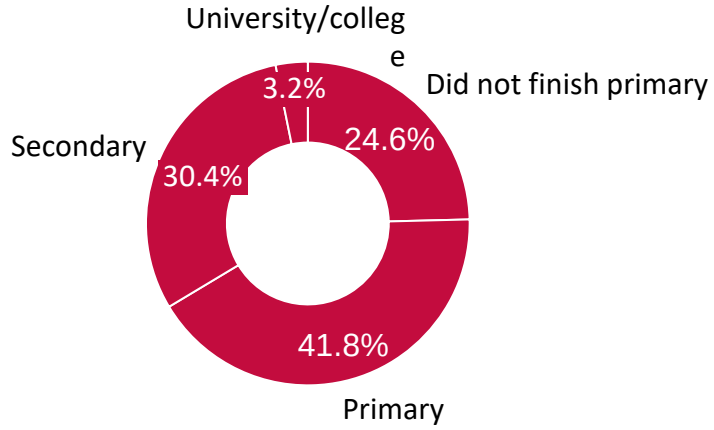


- Only a few digital solution providers have scaled beyond 10,000 users
- Consequently, **very few tech start-ups have broken even** – although majority are in "seed" or "early venture" stage, hence still too early to assess profitability
- Supply chain, data management and end-to-end platforms *(red and pink in graph)* have higher number of users, one reason being a longer operating history compared to other digital solutions

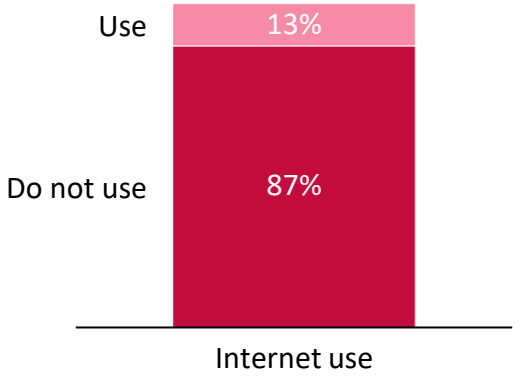
Note: Dataset based on available data only.
Source: stakeholder interviews and company websites

The majority of farmers in Indonesia: (i) did not advance beyond primary school (ii) are over 45 (iii) do not use the internet and (iv) farm less than 0.5 hectares

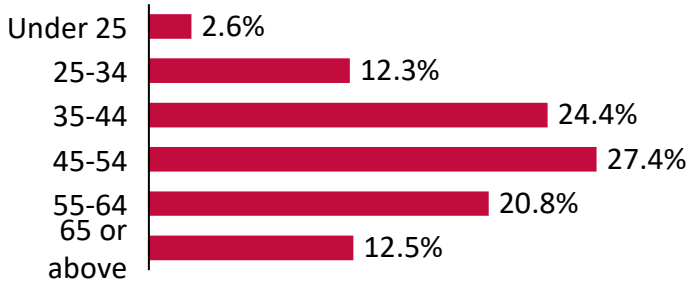
Level of education attained of farmers, % (2018)



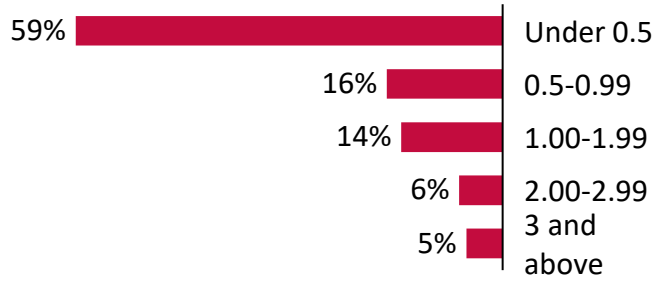
Usage of internet by farmers, % (2018)



Farmers by age bracket, % (2018)

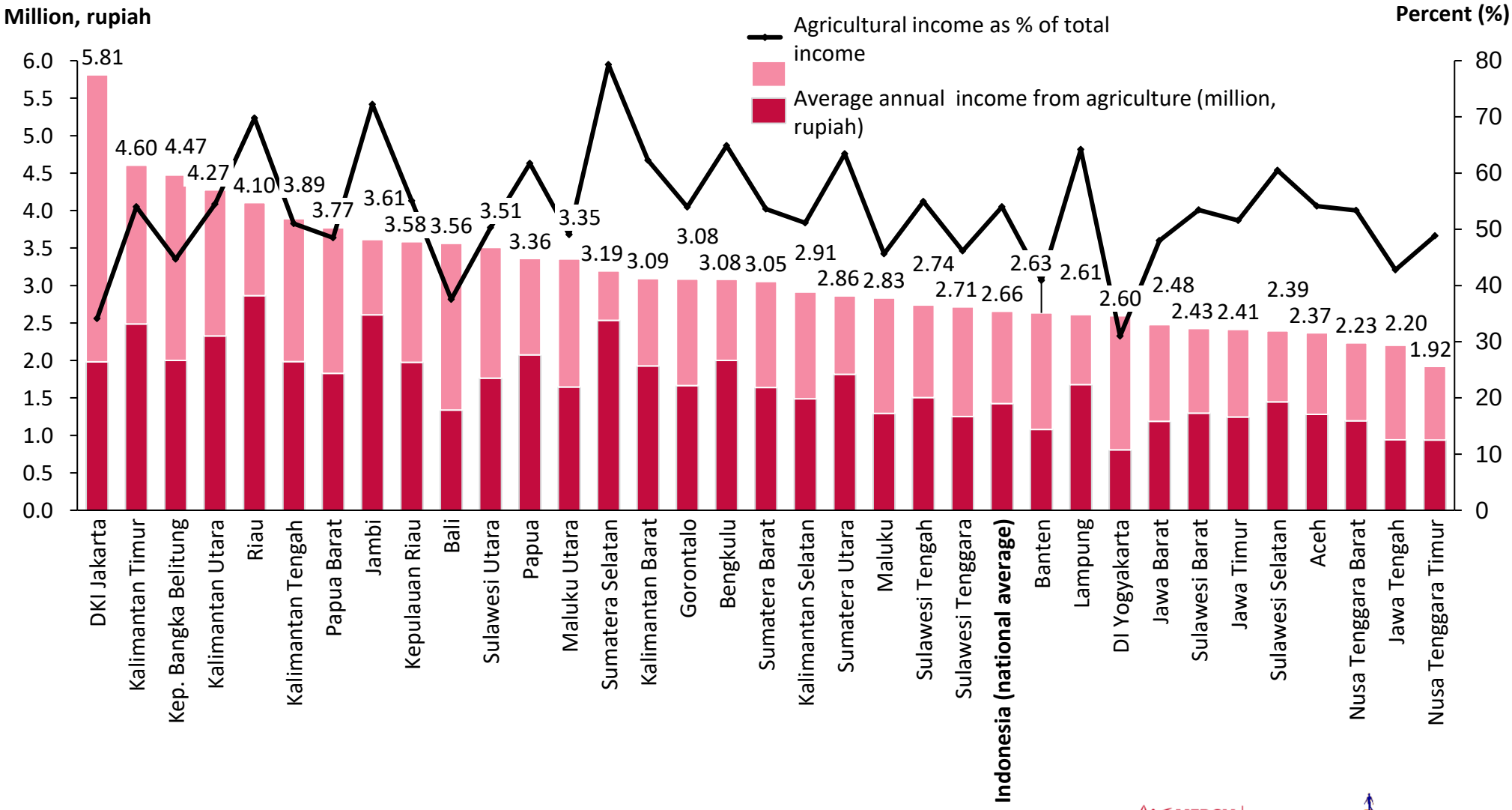


Size of land holding, % (2018)



Source: National Agriculture Census (2014)

Farmers in Kalimantan, Sumatra, and Papua are wealthiest (income from plantation crops); farmers in Java, Nusa Tenggara are poorest (staple/food crops)



Source: National Agriculture Census (2014)

We identify 4 primary categories of smallholder farmers, with varying levels of need and readiness for digital services

	1. Plasma / estate outgrower farmers	2. Independent farmers in structured value chains	3. Independent farmers in unstructured value chains	4. Subsistence farmers
Who are they?	• Farmers in palm oil, shrimp, rubber, cocoa, coffee, coconut • Estates provide support to farmers (typically organized in cooperatives) – inputs, credit • Backed by forward contracts	• Farmers in palm oil, coffee, fish, etc. who do not work as outgrower or under contract • Flexible on who they sell produce to and for what price • Do not receive input packages, training, credit	• Farmers in less structured value chains, but who have commercial operations • E.g. poultry, rice, avocados, green beans, etc.	• Farmers in staple crops, livestock, vegetables; operate at sub-commercial scale • Grow for consumption, and sell surplus into local markets
How do their needs vary?	• No need for market linkages as already have offtake relationship • Need for capex (replanting) and input credit via estates, who are constrained in what they provide • Estates / plantations have need for supplier management systems which enable them to track and manage interactions	• Often receive credit terms from traders who buy direct from farms / groups; but generally lack access to credit • Need training in agronomy, pest management, etc. – rely on public extension workers • Need market/pricing info and route to market	• Largest farmer segment of the 4 here – needs vary significantly • Market linkages are important, as buyers are fragmented • Need for capex/input credit, data / precision agriculture solutions, e-commerce	• High level of needs to get to commercial farm operations • Need for agronomy / training, financing for inputs / planting; and adoption of modern farming techniques e.g. irrigation
What are implications for digital service providers?	Low customer acquisition costs; can use estates / plantations as channel (B2B/SaaS opportunities); no need for e-commerce, rather financing and data management	Medium customer acquisition costs; some plantations work with traders to reach independent farmers (can use as delivery channel); need agronomy training, financing, and input packages	High customer acquisition costs; must use farmer unions/groups as sales/delivery channel, as fragmented offtakers; easier to target premium horticulture crops, like mangoes, avocados, garlic, herbs/spices	Very high acquisition costs; hard to serve profitably; low education and income; unlikely to be digital adopter; low bankability

Farmers have diverse financial, informational, and commercial needs; credit/savings, agronomy, market linkages are most pressing

	Area of need	Status quo	Level of unmet need	Addressable by digital?
Financial needs	Ability to make/receive payments	Mostly farmers transact in cash, or by bank transfer; limited uptake of mobile money; farmers often receive delayed cash payments	●	●
	Access to credit	Limited from formal FIs, more available from informal groups however in low amounts; traders/offtakers extend credit throughout season, but more common in certain value chains	●	◕
	Ability to protect against weather/crop risks	Few smallholder-focused insurance products available for weather or crop risks; formal FIs include insurance in loan pricing; Syngenta Foundation index insurance pilot was unsuccessful	◑	◔
	Ability/incentive to save	Farmers typically do not have e-wallets; many have bank accounts, but they are often inactive; farmers rely on storing cash and / or informal savings & loan groups in local village	◕	◕
Education / information	Knowledge of up-to-date market/pricing info	Market prices are often not transparent, especially as they can vary a lot based on island / region and import volumes; farmers rely a lot on middlemen / traders, who capture margin	◑	●
	Knowledge of agronomy/farming best practices	Varies by value chain; yields often low relative to global average; farmer groups have improved yields significantly in last few decades	●	◕
	Understanding of basic financial/business concepts	Often low; farmers do not understand financial products, and cannot commercialize their farm operations; more than 60% of farmers did not go beyond primary education	◑	◕
	Understanding / familiarity with digital tools, to enable use	Low; even farmers with smartphones often do not know how to use apps, beyond call and message; agtechs focus on app use for agents / farmer group leaders, instead of trying to get each individual farmer to use app	●	◔
Productivity improvement	Access to appropriate inputs (seed, fertilizer)	Generally inputs are available, especially in more densely populated islands like Java and Sumatra; however, often not affordable due to upfront outlay and farmers' seasonal income	◔	◑
	Use of machinery (e.g. pump, grinder, etc.)	Very limited; government has done recent push in irrigation; cost for mechanization typically prohibitive; no rental models focused on smallholders emerged from our research	◔	◔
Markets	Ability to transport, store, and aggregate produce for best return	In densely populated islands, like Java, aggregating and storage is not major issue; in more remote islands, infrastructure is often weak, with limited cold storage capacity and often long distance from local markets	◔	◕
	Ability to find fair market for produce	Where farmers are in more remote areas, they often have limited flexibility on when and to whom they sell; therefore, prices can fluctuate a lot and hit lows where demand is subdued	◕	●

Summary of key challenges for digital service providers in agriculture

Based on our landscape work and interviews, these are the key challenges which constrain growth in digital services for agriculture in Indonesia

General to agtechs	Specific to digital lenders / P2P platforms	FIs / value chain actors looking to innovate in digital platforms
• Access to growth / working capital • Ability to acquire customers / farmers quickly to scale • Striking partnerships with value chain actors or FIs • Finding reliable revenue model / paying customers • Building out agent network / field force model • Logistical capabilities (having to do too many things across different aspects) • Front / back end product development / robustness of tech	• Ability to raise capital for on-lending • Slow fundraising cycles from retail lenders (2-3 weeks) • Striking partnerships with traditional FIs / non-bank lenders (and regulatory constraints) • Developing credit scoring algorithms / use of alternative data • Implementing robust credit processes (lack of basic documentation / farming data) • Effective collections procedures and channels (e.g. calls, SMS, visits; frequency, etc.) • Covid-19 impacting perceptions on repayments	• Knowledge of which agtech/fintech partners to work with • Financial / reputational risks associated with partners • Expertise in digital product development and channels • Understanding of customer segment • Lack of buy-in at executive level • Organizational bureaucracy and constraints

Plantation and premium export crop value chains can offer some quick wins; staple crops and general horticulture can unlock big impact if successful

	Summary	Prime examples	Viability for digital services?	Impact potential?
1 **1. Plantation crop value chains**	Value chains with finite set of large buyers/trading houses; farmers either work directly with buyers in schemes, or via traders	Palm oil, rubber, cocoa, coconut, coffee	***Easier to serve:*** *can partner with estates for market entry; more secure cashflows; more de-risked for FSPs*	***Medium:*** *Many farmers already served by offtakers/donors; have more stable livelihoods*
2 **2. Large but loose value chains of national importance**	Significant value chains in terms of size and important to food security for fast-growing population	Shrimp, fish, maize, rice, soybeans, poultry, eggs	***Harder to serve:*** *high costs of customer acquisition; volatile cashflows; higher perceived credit risk*	***High:*** *Many farmers are sub-commercial; play critical role for national food security*
3 **3. Small-to-medium premium / export value chains**	Higher-value crops with export potential and presence of premium offtakers	Chilies, mangos, avocados, green beans, garlic, spices, ginger, seaweed	***Easier to serve:*** *farmers are higher income, more commercial; can partner with premium offtakers*	***Low-to-medium:*** *Low-hanging fruit for intervention; farmers are more commercial, can invest*
4 **4. Horticulture and staple crops (i.e. fast-moving, high demand)**	Food crops which are grown across country in large volumes for domestic market	Rice, cassava, tomatoes, potatoes, onions, cabbages	***Mixed bag:*** *less formal value chain, but crops are prevalent so lowers transaction costs*	***Medium-to-high:*** *high variance in farmer profile; crops are critical for domestic consumption*

Possible modes of interventions

There are opportunities to make impactful interventions in financing, technical assistance, partnerships development, and ecosystem level interventions

Type	Mode of intervention	Are other actors (philanthropic / governmental) doing this?	Typical for Rabo Foundation?	Typical for Mercy Corps AgriFin?
Financing	Direct financing of loan portfolio	**Some** – several digital lenders have partnered with FIs / donors, but primarily rely on P2P funding; some FIs lending to farmers via agtech but few have digital component	Yes	No
	Indirect financing of loan portfolio (via intermediaries)	**Some**, e.g. KUR program - but majority of funds do not go to smallholders	Yes	No
	Corporate loan / working capital	**Limited** – agtechs/fintechs often cannot raise venture/mezz debt as too early stage and most investors focus on equity	Yes	No
	Credit risk guarantee / first loss	**Some -** e.g. KUR program and some donor initiatives – but not always enough to get banks lending to farmers	Yes	Yes
	Equity / quasi-equity	**Yes** – there are various VC investors active in agtech/fintech	No	No
	Innovation grants	**Some** – there are various grant awards / competitions	Yes	Yes
Technical assistance	Tech / product development	**Limited** – there are few donors supporting product development	No	Yes
	Data / platform development and analytics	**Limited** – there are few donors supporting product development	Yes	Yes
	Credit scoring / process improvement	**Some** – there are some TA programs focused on support to banks / FIs for agricultural lending, but none for digital agri lenders	Yes	Yes
	Strategy and operational support	**Some** – there are some TA programs focused on general org support	No	Yes
Partnerships development	Linkages to FIs and large value chain actors as buyers of services	**No**	Yes	Yes
	Linkages to value chain actors for customer acquisition / growth	**No** – agtechs/fintechs	No	Yes
	Facilitate partnerships for bundled services	**No**	No	Yes
Ecosystem building	Convenings and networking	**Some**	Yes	Yes
	Research and market intelligence	**Some**	Yes	Yes
	Policy & advocacy	**No** – limited to no specific focus on digital services for agriculture	No	No
	Technical assistance / funding to accelerators and innovation competitions	**Some** – organizations like GSMA	Yes	No

Priority interventions (1/3)

	Rationale	Intervention
1. Providing debt funding directly to digital lenders	• There is an emerging set of digital lenders who are at or post Series A stage with portfolios of approx. $2.5M-$25M • Several of these players have started out raising crowdfunding from retail investors; this gives them low cost of capital, but is not scalable	*Provide wholesale financing to fintechs for on-lending to farmers; technical assistance around credit systems and risk management; linkages to structured value chains via offtakers / input firms*
2. Setting up special digital credit fund / facility managed by intermediary(-ies)	• High transaction costs and risk concentration associated with supporting digital lenders individually • Supporting one or two digital lenders does not necessarily build the ecosystem as a whole; RF can have wider reach setting up fund	*Set up dedicated Indonesia Farmer Digital Loan Facility focused on digital loans to eligible farmers; facility to be managed by specialist fund manager e.g. Impact Credit Solutions; can have TA component to build capacity of digital lenders*
3. Providing venture / mezz debt to agtechs	• There are diverse VC investors focused on providing equity and growth capital • Venture debt is less available, but can play a critical role in funding start ups through growth stage	*Develop venture debt product targeting growth-stage companies – e.g. 2-year tenor, repayable on achieving certain revenue/margin thresholds; can layer in concessional rates, FX risk transfer, etc.*
4. Facilitating partnerships between digital lenders (or agtechs) and traditional FIs/MFIs	• Most digital lenders are exploring commercial partnerships with traditional banks and MFIs, but finding it difficult to do • Many agtechs are also starting to realise the potential of farmer data to unlock credit and are seeking partnerships	*Broker partnerships between fintechs /agtechs and traditional lenders; technical assistance and support in product development can go alongside*

Priority interventions (2/3)

	Rationale	Intervention
5. Digitizing bulk payments in the agricultural sector via e-wallets	• Mobile money account ownership and usage remains very low, especially in rural areas and among farmers • One way to drive mobile money adoption is by digitizing the existing flow of transactions in the sector, working with source of those payments (government, buyers/ offtakers)	*Facilitate bulk payments partnerships between major e-wallet providers and large agribusiness, government fertilizer subsidy schemes, to drive mobile money adoption*
6. Connecting data platforms with financial institutions / large agribusiness / other use cases	• Several leading agtechs are developing B2B platforms for farmer-level data and big data (satellite, drones, etc.) – e.g. Hara, Koltiva, Meridia • Key use cases for this data is around credit scoring / risk assessment (for banks, MFIs, insurance firms), supply chain management (for offtakers), and demand forecasting (for input companies)	*Provide product development support to data platforms and facilitate partnerships with B2B clients from FIs to large agribusiness*
7. Supporting roll-out of commercial models around PrecisionAg-as-a-Service	• There are various companies who are using devices plus software and IoT analytics to facilitate precision agriculture; these models are relatively capital intensive • Other markets have seen innovation around leasing models and shared-use infrastructure to make the technology more available	*Financing and product development for drone / remote sensor to expand use of technology into new segments*
8. Supporting scaling of e-learning solutions for financial literacy and agronomy	• E-learning tools can play a critical role in driving uptake / usage of other digital services, lowering training and extension worker costs, and ensuring farmers derive full benefit from inputs and credit • Standalone solutions are not commercially viable and must be plugged into bundled offerings with partners	*Providing grant funding for content development / licensing and facilitating partnerships between learning platforms and partners for bundled offerings*

Priority interventions (3/3)

	Rationale	Intervention
9. Helping agtechs build out field force and agent networks	• Agtechs are building out their own networks of agents who are touchpoint with farmers for sales, training, and relationship management • Effective field force requires partnerships and use of agent apps to manage efficiently – this is complex and costly, with high variance in quality and performance	*Provide grant funding for field force recruitment; support development of agent network management apps; facilitate partnerships with field staff of input companies, plantations, parastatals*
10. Supporting marketplaces / e-commerce to integrate backwards in supply chain with farmers	• There are a number of marketplace / e-commerce players; some models create linkages between farmers / producers and retailers / buyers, such as through kiosks • Going further back in supply chain to small farmers is costly and has high logistics requirement to ensure order fulfilment	*Provide grant funding / concessional debt to support e-commerce players to link agri-kiosks back in supply chain and source more directly from farmers; facilitate partnerships with farmer organizations*
11. Support data platforms / insurtech to develop agri insurance products	• Even with digital credit and new channels, issuing loans to farmers carries inherent risks related to weather and crop disease • Embedded insurance models have worked to good effect in other markets; insurtech firms can partner with underwriters and data providers to offer agri insurance	*Facilitate partnerships between innovative insurance players and lenders in agriculture; support product development and scale up; connect with data providers to enable better risk pricing*
12. Organize convenings / industry events	• Agtech firms often operate in different ecosystem to large agribusiness (VC ecosystem as opposed to agriculture) • There is an important role to play in bridging divide between agtechs and broader agriculture sector	*Fund and organize industry events specifically focused on bridging gap between tech firms and agribusiness, such as AgriFIn's annual learning events or partnership pitch days*

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