The role of tech-enabled formal financing in agriculture in India

28 May 2020

MSC and ThinkAg researched the AgTech landscape in India with a focus on innovations in financing small and marginal farmers

A. Key objectives of the study

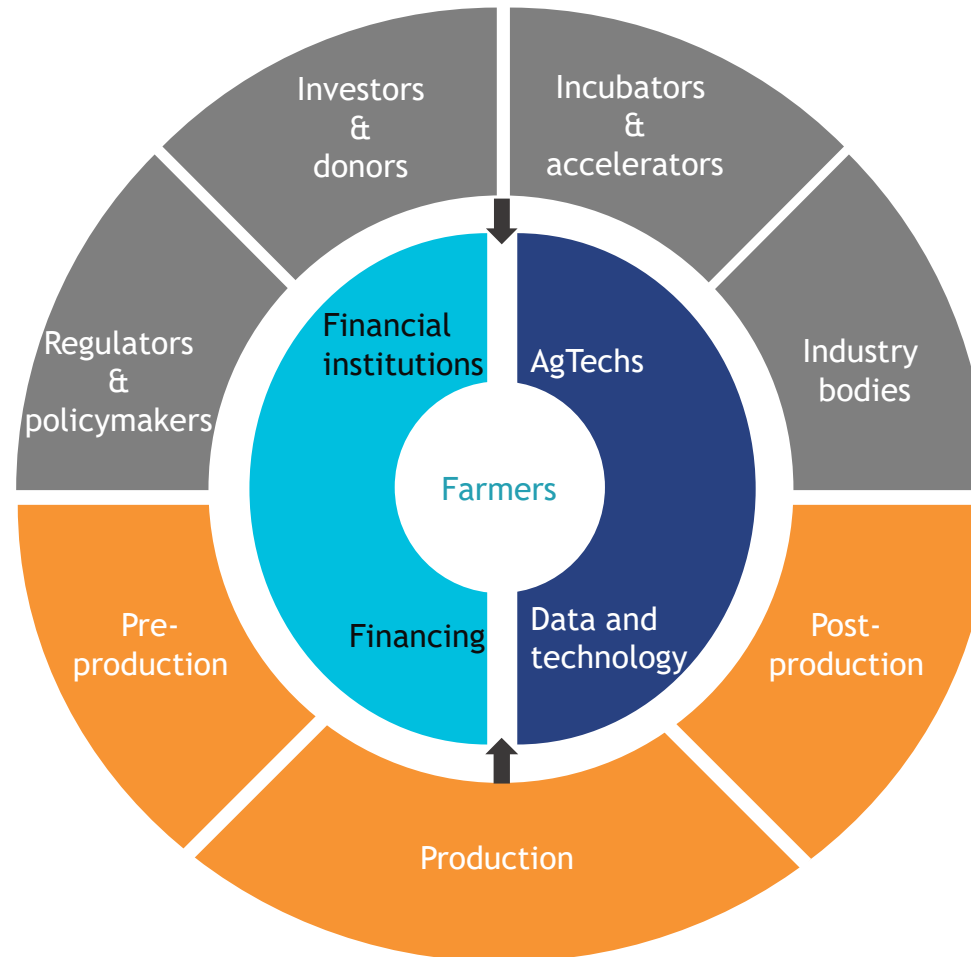Understand the landscape of farmer financing and AgTech in India

Study new engagement models around technology in the AgTech space

Understand the role of lenders to adopt AgTech solutions to provide finance to farmers

B. Stakeholders in the ecosystem around farmer financing

Farmers

Financial institutions
AgTechs
Financing
Data and technology

Investors & donors
Incubators & accelerators
Regulators & policymakers
Industry bodies
Pre-production
Post-production
Production

C. Structure of the presentation

Chapter 1
Financing the farmers

Chapter 2
AgTechs in India

Chapter 3
The intersection of AgTechs and incumbents

Chapter 4
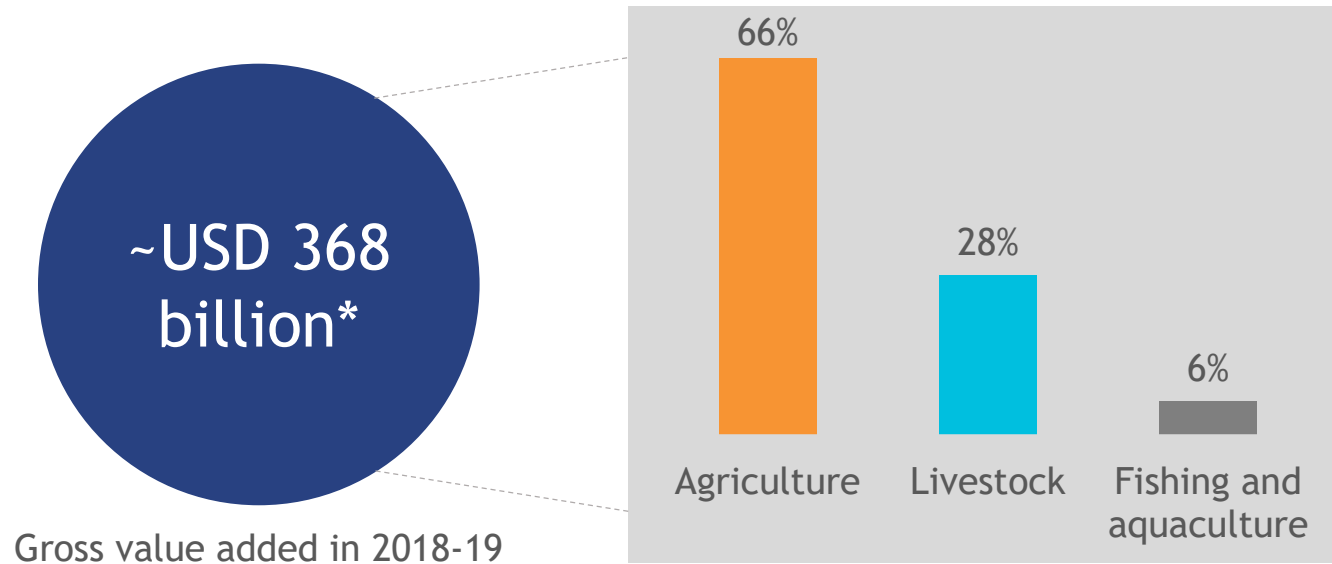Ways to improve the ecosystem for AgTechs in India

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1. Financing the farmers: The current scenario and gaps

The agri and allied sector, which contributes USD 368 billion to the economy, is up for tech-based disruption
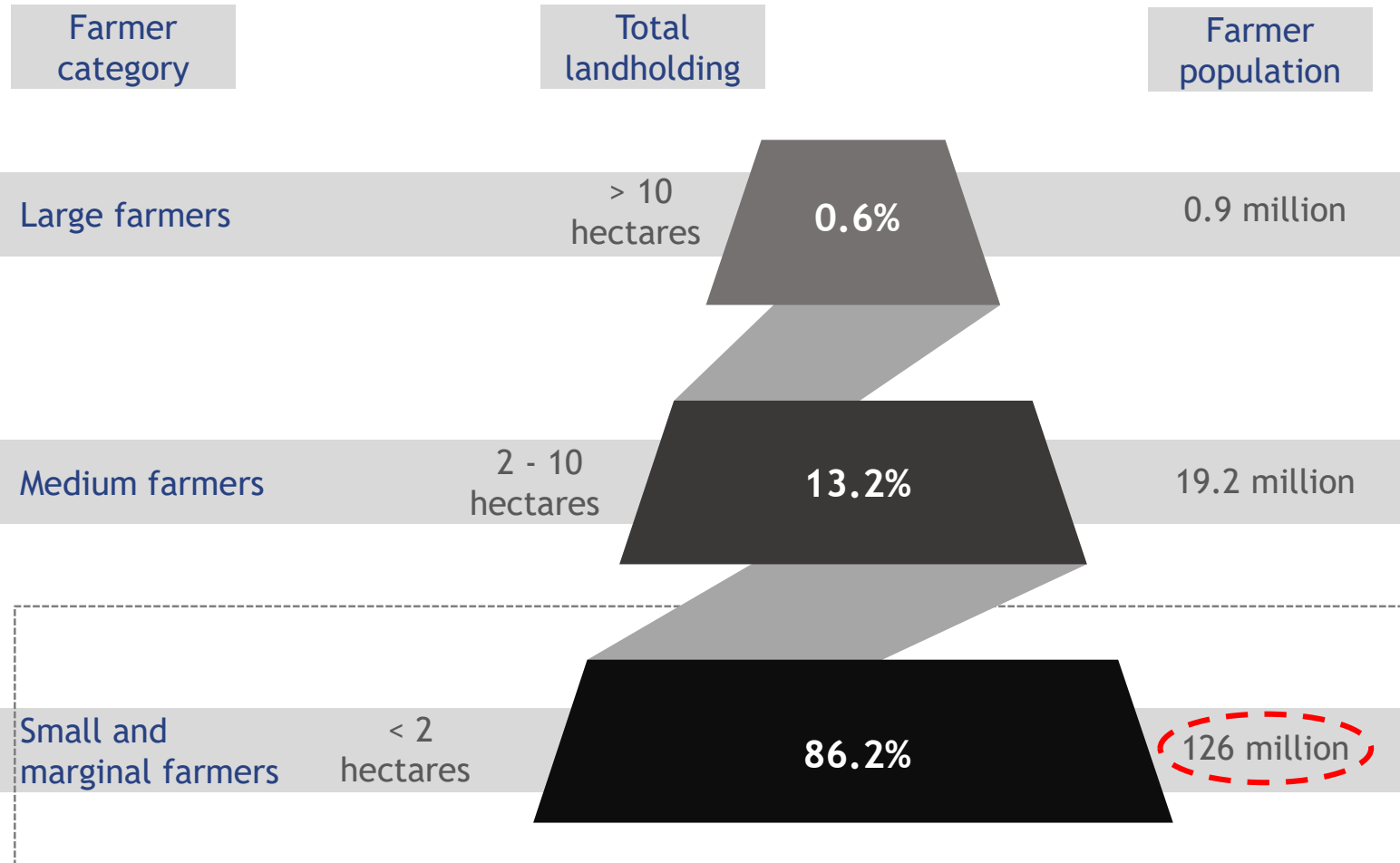
Gross value added by the agriculture and allied sector[1]	Key facts related to the sector[2]

~USD 368 billion*

Gross value added in 2018-19

66% Agriculture
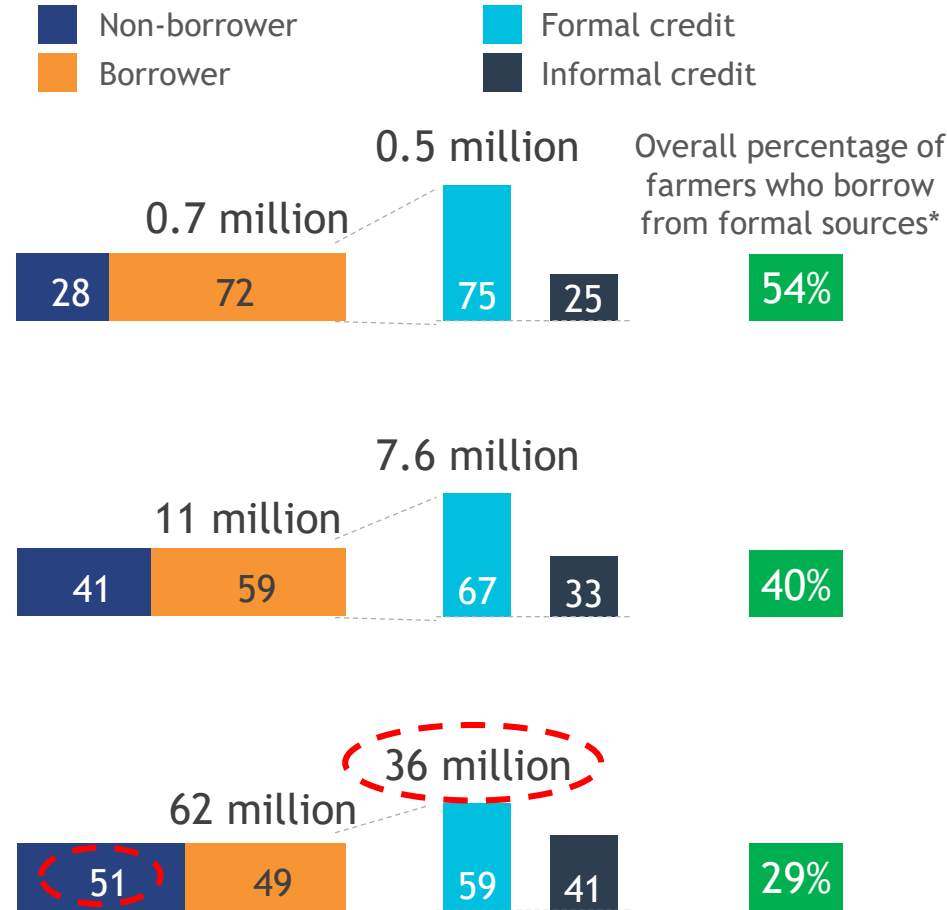28% Livestock
6% Fishing and aquaculture

- **55%** of the population depends on the agriculture and allied sectors

- **~16%** is the contribution to the economy by the agriculture and allied sectors

- **~3%** is the growth rate of the agriculture and allied sectors as against 2017-18

- **USD ~38 billion** is the value of the total agricultural exports in 2018-19

- **USD ~21 billion** allocated in the interim budget (2019-20)

* Provisional estimates of gross value added at a basic price by economic activity at current prices

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Only 30% of all farmers borrow from formal sources, while ~50% of small and marginal farmers are unable to borrow from any source

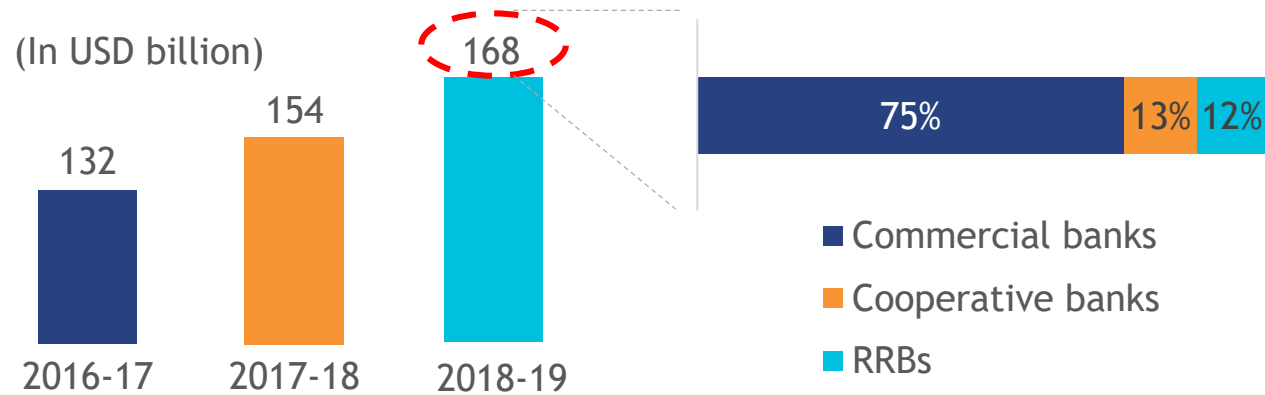## Breakup of types of farmers w.r.t landholding[1]

Farmer category	Total landholding		Farmer population
Large farmers	> 10 hectares	**0.6%**	0.9 million
Medium farmers	2 - 10 hectares	**13.2%**	19.2 million
Small and marginal farmers	< 2 hectares	**86.2%**	126 million

Percentage of farmer households[2]

- Non-borrower
- Borrower
- Formal credit
- Informal credit

Overall percentage of farmers who borrow from formal sources*

Large farmers
0.7 million | 0.5 million
| 28 | 72 | | 75 | 25 | **54%** |

Medium farmers
11 million | 7.6 million
| 41 | 59 | | 67 | 33 | **40%** |

Small and marginal farmers
62 million | 36 million
| 51 | 49 | | 59 | 41 | **29%** |

* Formal sources include commercial banks, RRBs, SHG-bank linked, SHG-NBFC or MFI, and cooperative societies
Informal sources include relatives and friends, moneylenders, landlord, and input suppliers

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Banks provided agriculture credit worth USD 168 billion in FY18-19; however, 50% of the credit was offered to medium and large farmers

Total agriculture credit disbursement by banks[1,2]

(In USD billion)

132	154	168
2016-17	2017-18	2018-19

75%	13%	12%

- ■ Commercial banks
- ■ Cooperative banks
- ■ RRBs

Deployment of bank credit across sectors in FY 2018-19[3]

Parameters	Agri and allied activities	Industry or MSMLEs#	
	All banks	PSBs	PVBs + FBs
Credit deployed (in billion USD)	168	208	207
Percentage of gross bank credit	13		32
NPA (in %)	7-9	16	5

Key facts related to lending to SMF in 2018-19[1,2]

- ■ **Most banks** resorted to priority sector lending certificates (PSLCs) to achieve the PSL targets under agriculture

- ▪ The volume of overall PSLC trading (USD 44 billion) increased by **78 %** in FY 2019 compared to FY 2018

- ■ **USD 15 billion** is the volume of PSLC-SMFs in 2019, a growth of **62%** compared to FY 2018

- ▪ Private and foreign banks emerge as major **buyers**; while PSBs, RRBs, and SFBs are the major **sellers**

- ▪ Only **~40%** loans are long-term*

#MSMLEs stands for micro, small medium and large enterprises
* Short-term crop loans are used for pre-harvest activities, such as weeding, harvesting, sorting, and transporting. Long-term loans are taken to invest in agricultural machinery and equipment, or for irrigation.

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Banks are reluctant to offer credit to small and marginal farmers due to poor access, limited information, and unpredictable policy environment

High cost of servicing and risks involved

- Difficult-to-reach remote areas
- High acquisition and servicing cost for small and marginal farmers (SMFs)
- Perceived high risk of default

Difficult to verify reliable information

- Difficult and uneconomical to gather and verify farm-level and farmer-level data
- Limited visibility on financial information like cash flows and credit history
- Limited expertise to verify or estimate or do both on the income from alternate sources

Risks related to policy and environment

- Farm loan waiver by state governments* affects the culture of credit among farmers
- Perception of higher NPA under PSL, particularly agriculture

In last 10 years, farm loan waivers has touched USD 63 billion, with almost all the state governments joining the bandwagon

Source: Stakeholder interviews, MSC, and ThinkAg analysis

2. AgTechs in India:
Developing a platform for ag-fintechs

Evolving agtech landscape – high quality startups, increasing investor interest

Most AgTechs have emerged in the past five years and are still at a nascent stage

3116 — Registered start-ups in food and agriculture in India

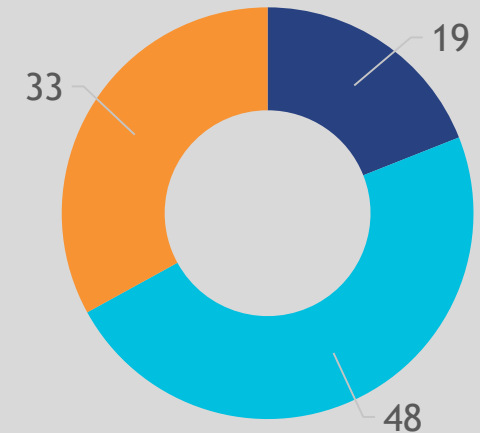**2** — India's rank globally based on the number of AgTechs

25-30% — Growth in number of startups year on year

Approx USD 500 mn investment since 2014

Investment (USD Million)

90+ Active institutional investors

~250 Angel investors

10 Active AgTech Investors

~70% deals are focused on seed-stage and early-stage AgTechs

Stage-wise investor deals (2016-2019)

- 19
- 48
- 33

■ Grant/Angel
■ Seed
■ Series A and beyond

Source: Tracxn, MSC, and ThinkAg analysis

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In the entire agri value chain, we see Fintech opportunity in all categories of agtech solutions

Farm management and data analytics

- Remote sensing, smart phones, drones, sensors & IoT
- Predictive modeling, crop monitoring, traceability

Cropin NubeSol
agricx Desh ki mandi Fasal
SatSure INTELLO LABS

Agri Financing / FinTech

- Value chain financing
- Fintech
  - Farmer onboarding
  - Credit scoring
  - Input linked credit

Samunnati VALUE CHAIN FINANCE arya Simplifying Agribusiness
Jai Kisan farMart for farmers from farmers
BIJAK

Agri – input marketplaces

- Direct to farm
- Data and advisory driven
- Channel agnostic
- Last mile delivery

AgroStar Gramophone
BigHaat.com ONE STOP AGRO STORE Unnati
DeHaat Seeds To Market

Livestock management

- Livestock—cattle, poultry, and fisheries
- Data driven supply chain and financing

PASHUCHIKITSA A GREAT IND' AQUA CONNECT
stellapps Smart Systems, Stellar Applications. Eruvaka

Agri –output marketplaces

- Demand aggregation
- Kirana stores, modern trade, horeca
- Procurement from farmers and FPOs
- Staples & fresh produce

WAYCOOL Kamatan
ninjacart
crofarm S4S technologi science for society

Mechanization / Novel farming

- Hardware
- Farming as a service
- Vertical farming / hydroponics

SICKLE INNOVATIONS Design|Farming|Technology TOOLSVILLA
FutureFarms LET'S TAKE CONTROL CLOVER

Source: MSC and ThinkAg analysis

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However, we continue to see challenges around funding, partnerships, and access to data for scaling Agri Financing solutions

Limited funding for early-stage AgTechs

- High risk perception among investors – policy, long gestation period, climate risk
- Lack of leverage – need for credit guarantee structures

Collaborations with industry players and banks

- Contrasting viewpoints about the offerings and potential of AgTechs
- Mismatch of expectations between corporate partners and startups
- Banks have own legacy systems

Limited availability of agri-data and access to it

- Difficult to access reliable agri-data owned by the government
- AgTechs have to spend significant resources to gather farm and farmer-related data
- Only a few states have digitized land records; however AgTechs have no access

Challenges at the farmer level

- High cost to acquire small and marginal farmers
- Limited adoption of smartphone penetration—although it is now growing
- Digital payments are not commonplace

3. The intersection of AgTechs and incumbents: Gaps and requirements

AgTechs have a role to play in farmer financing—from origination to assessment, monitoring, and recovery (1/3)

Origination	Underwriting/Credit assessment	Servicing and monitoring	Collection

Category	Data required by FIs	Offerings of AgTechs	Source of data	AgTechs that offer such data
Personal profile	Demographic details	Field staff to onboard farmers	Physical on-field	Haqdarshak, SocialCops
Income and cropping profile	▪ Details of current and previous income: Farm and non-farm income ▪ Crop name ▪ Seasonal or annual ▪ Irrigated or Unirrigated ▪ Proposed crop for the next financial year ▪ Arrangements for cultivation, inputs procurement, marketing, storage, and transportation of the produce	▪ Data based on proximity to the nearest *mandi* ▪ Historical data on the type of crops and their quality ▪ Weather forecasting ▪ Tracking irrigation facilities ▪ Assessment of soil quality ▪ Price prediction tools ▪ Agri-inputs purchased online, personal profiles ▪ Historical data on outputs sold	Physical on-field Satellite imagery Weather stations Smart sensor Input data Output data	FarmGuide, Jai Kisan, FarMart, Pay-agri SatSure, CropIn Skymet Farmsys AgroStar, BigHaat, Gramophone BigBasket, NinjaCart, WayCool Foods, De'haat, AgriBazaar
Credit history profile	▪ Deposit and loan account ▪ PMJDY overdraft ▪ Amount of loans sanctioned and outstanding	Sourcing information from the credit bureau	Credit bureau	N/A

AgTechs have a role to play in farmer financing—from origination to assessment, monitoring, and recovery (2/3)

	Origination	Underwriting/Credit assessment	Servicing and monitoring	Collection

Category	Data required by FIs	Offerings of AgTechs	Source of data	AgTechs that offer such data

Particulars of agri land holdings and crops	▪ Nature of land
	  • Owned as opposed to leased
	  • Irrigation facilities
	  • Percentage of land irrigated
	  • Market rate per acre
	  • Number of owners, among other factors
	▪ Access to the *mandi*
	▪ Distance from the farm to home
	▪ Type of crop sown, yield estimates, past performance, availability of input
		▪ Develop solutions to digitize land records with beneficial ownership	Physical on-field	FarmGuide, FarMart, Jai Kisan

Movable assets or properties	▪ Types of assets like irrigation pump sets, tiller, tractor, transport vehicle, etc. ▪ Livestock	▪ Tap into existing networks to source information	Physical on-field	FarmGuide, FarMart, Jai Kisan

Source: Stakeholder interviews, MSC and ThinkAg analysis

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AgTechs have a role to play in farmer financing—from origination to assessment, monitoring, and recovery (3/3)

	Origination	Underwriting/Credit assessment	Servicing and monitoring		Collection
Category	**Data required by FIs**	**Offerings of AgTechs**		**Source of data**	**AgTechs that offer such data**
Output profile	▪ Sowing and harvest estimates ▪ Current and historical cropping frequency	▪ Crop monitoring to predict NPAs ▪ Yield estimation ▪ Visibility of usage of credit ▪ Demand forecasting		Satellite imagery Input data	Cropin, SatSure, AgroStar, BigHaat, Gramophone

	Origination	Underwriting/Credit assessment	Servicing and monitoring		Collection
Category	**Data required by FIs**	**Offerings of AgTechs**		**Source of data**	**AgTechs that offer such data**
Actual collection	▪ Visibility on crop harvest and prices	▪ Market linkages for farmers ▪ Partnerships with warehouse owners and support to grade and sort the output		Physical App-based Mobile imagery Spectrometry	NinjaCart, WayCool, Jumbotail, Kamatan, Crofarm, KrishiHub, AgroWave Agricx, Intello Labs

However, meaningful partnerships between financial institutions and AgTechs need some more time to scale due to a variety of reasons

No full-stack solution

- Most AgTechs offer standalone, partial solutions to banks
- Banks find it difficult to collaborate with multiple AgTechs
- Banks are likely to prefer AgTechs that offer full-stack solutions

Challenges with non-risk-sharing model

- Banks hesitate to collaborate with AgTechs, which do not share any liability
- Banks require guarantee from AgTechs to mitigate or minimize their risk

Limited understanding of AgTech solutions

- Most banks have a limited understanding of the solutions and potential of AgTechs
- Banks believe that most AgTechs provide little beyond some additional—or satellite—data points

Limited trust on data captured by AgTechs

- Banks trust their local staff for any information related to farmers and their crops
- Banks believe that AgTechs fail to add value in assessing the creditworthiness of SMFs
- Banks require AgTechs to have data points for around 4-5 years before conducting a pilot

An end-to-end agri-stack platform to improve existing farm-lending processes

One-stop access for banks

Origination → Assessment → Disbursement → Monitoring → Collection

Features of this model:

1. Innovator group
Create a group of innovators that offer a variety of solutions to work together with banks in a particular district

2. FI group
Create a group of leading banks and financial institutions that can work together to discuss processes and solutions with AgTechs

3. Pilot development
Choose one district in which the bank or FI currently offers lending and deep dive into existing processes where AgTechs can plug in their solutions

4. Build data and history
Digitize the entire process and enable digital payments to create year-on-year records to facilitate ease of lending going forward
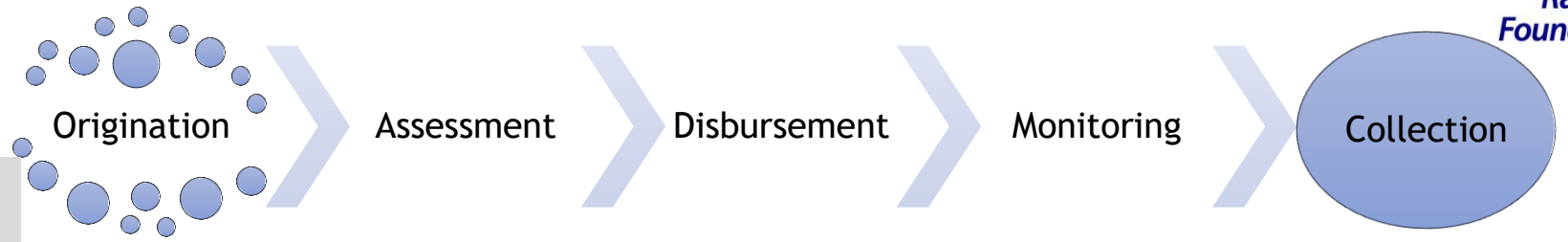
Source: MSC and ThinkAg analysis

ThinkAg   MSC

4. Ways to improve the ecosystem for AgTechs in India

A single unified digital agri-database "AgriStack" for India can enable financing for small and marginal farmers

Present constraint	Focus area	Key recommendation	Expected outcome
Lack of a public platform that provides access to agri-data	Creation of AgriStack	Build AgriStack—a secure digital platform that enables access to farmers by providing information related to farm, farmer, and crop	A public platform to drive innovations across the value chain
Only a few states have digitized land records completely	Data digitization	Create digital GPS-tagged land boundaries that guarantee land titles, digital records in a demat form, and open APIs for AgTechs	A single window to verify and gather the required details economically
AgTechs find it challenging to partner with government	Ease of business	Create a single window to address various concerns that AgTechs face, and create a provision for short-term working capital to partner AgTechs	B2G partnerships with access to data of a large number of SMFs

Source: Stakeholder interviews, MSC and ThinkAg analysis

Development financial institutions should help build agri-market infrastructure and offer capital to institutions that lend to SMFs

Present constraint	Focus area	Key recommendation	Expected outcome
The storage gap for agricultural produce is at 35 million tons and post-harvest losses is at ~USD 13 billion	Asset infrastructure development	Promote public-private partnerships to augment necessary storage and warehousing infrastructure and focus on post harvest financing	Asset infrastructure to improve and post harvest financing to become more acccesible
Multiple challenges limit the growth and sustainability of FPOs	Support to FPOs	Provide technical handholding, capacity building, financing, and market linkage support to FPOs to run sustainably	Effective FPO channel ready for partnerships with various players
The high cost of capital to NBFCs results in a high rate of interest for SMFs	Source funds	Explore the creation of separate fund like RIDF or seek alternative sources of funding from global development and financial institutions like ADB, IFC, and GIZ. to institutions that lend to SMFs	Serious lenders can borrow capital at a low cost

Source: Stakeholder interviews, MSC and ThinkAg analysis

Conclusion

- Ag-fintech opportunities need **partnership approach** between financial institutions and startups for pilots and scale

- **Platform of agtech startups** including – input, output, data, financing – rather than each startup individually, has much better chances of scale

- **Digitisation, access to alternate data and transactions** in the agri supply chain will improve the integration of financing solutions

- **India could be the hub** of developing ag-fintech solutions for rest of the world particularly for regions like Africa, South Asia and South East Asia with similar farming profiles

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