



AgClinic: Value Chain Finance
A ThinkAg Initiative

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Building the Bridge via AgClinics

AgClinic is a curated workshop designed to engage partners to discuss and evolve solutions to pressing problems in the Food and Agri value chains. This edition of AgClinic was focused on increasing access to Value Chain Finance(VCF) with a specific focus on the role of technology and innovation. Participants included AgTech & FinTech innovators, financial service providers – banks, non-banking finance companies, corporates, and foundations/multilateral agencies. All stakeholders of agriculture value chain actively contributed to the proceedings a number of learnings emerged.

In recent years, we have seen the emerging fintech landscape building solutions using alternative data and filling the unmet credit needs of the urban consumer with the support of the existing eco-system. Our goal at ThinkAg was to build the bridge between existing eco-system for agri-finance with innovators aiming to disrupt financing in Indian Agriculture.

The discussions at AgClinic specifically addressed challenges in VCF both for the Agriculture Inputs and outputs (commodities, fresh produce, livestock, etc.). Quality of data capture was a common theme. Presentations were made by NABARD (National Bank For Agriculture & Rural Development) followed by industry leaders and startups. Established players like Bayer and NCML (National Collateral Management Services Limited) provided insights into new initiatives while talking about how they were engaging with innovators. New entrants like Samunnati, Agrostar, Cropin and Farmart presented their approaches to supporting in building data streams that will support in increasing access to finance. A vibrant discussion ensued elucidating the role that incumbents and new entrants could play to scale new solutions to unlock Value Chain Finance. Refer Annexure 1

Executive Summary

a. Newer NBFC's are more likely to play an increasingly important role in Ag Value Chain Finance

With the existing eco-system facing challenges in terms of costs and risks- both operational and regulatory, new agile NBFCs that deploy innovative tools to assess the creditworthiness and to manage value chain risk will garner more customers.

b. Technology led companies are moving to farm led information unlocking microdata that can potentially be used for financing

Tech startups are tapping into rural networks, using alternative data sets to build a digital financial footprint of potential borrowers. This footprint is used to assign credit scores. The credit score combined with transactions with Ag input and output companies allows for increased visibility of risks associated with lending to smallholder farmers. By digitizing transactions, these startups are paving the way to create a credit history for the farmer

c. Data combined with analytics, when deployed at scale, is key to unlock opportunities in VCF

Data capture from a range of value chain activities of producers is a necessary condition to unlock the opportunity of value chain financing. This data needs to be in the public domain and should be available as an input API to technology players, financial institutions to build financial products for lending. The state has a critical role to play in enabling uniformity, data hygiene and protection of privacy (where required by law).

d. Partnerships in piloting different innovations will be critical to shorten the time to market.

Incumbents can accelerate the adoption of these innovations by formulating partnerships with innovators, sharing learnings (non-proprietary), thereby raising the bar for access to finance in the ecosystem.

Value Chain Financing

In India, smallholder farmers (less than 2 hectares of land) are 86.2% of total farmers¹. Conventional sources of finance don't reach the smallholder farmers; hence innovation in value chain financing is essential if we are to overcome this unfortunate anomaly. To illustrate - take the case of a small farmer who typically takes loans of less than ₹2 lakh². RBI data show that in FY17, the share of loans of ₹2 lakh or less was just 40 per cent of the total agri credit of ₹10.78-lakh crore. In contrast, loans between ₹2 lakh and ₹1 crore accounted for 47 per cent of the disbursements, and around 13 per cent of the total agri credit was accounted for by loans of ₹1 crore or more. Loans of over ₹100 crore were sanctioned to just 210 borrowers.³ This is a significant gap that new tech-enabled innovative financing products aim to address.

When it comes to post-harvest financing, the lending is asset-based i.e collateral is necessary to avail credit. Warehousing receipts, from certified warehouses, can be used as collateral for funding from banks and lending institutions. Under the Warehousing (Development and Regulation) Act of 2007, which came into force from 2010, banks are advancing over 40,000 crores against warehousing receipts; it was just 5,000 crore a decade ago. In comparison to the overall credit in agriculture, warehouse receipt based financing is another large untapped opportunity for improving flow to the agriculture ecosystem.⁴

The concept of the value chain has its origins in the early 1980s and it talks about a set of coordinated and timely activities that are performed by one or more economic actors/operators in the provisioning of goods or services to the customers. Increase in value, both real and perceived, through the set of activities is a key driver for the economic sustainability of the value chains. The term "Value Chain Finance" refers to the flows of funds to and among the various links within a value chain. It relates to any or all of the financial services, products and support services flowing to and/or through a value chain to address the needs and constraints of those involved in that chain, be it to obtain financing, or to secure sales, procure products, reduce risk and/or improve efficiency within the chain.

Unlike traditional asset-based financing- in which the repayments are covered by the purchasing and mortgaging an income generating asset, Value Chain Finance is largely unsecured and dependent on the cash flows accruing to the farmer. In VCF, the lender needs to have visibility on borrower's farming income specifically on the timing and frequency of that income to cover the principal and interest. With poor availability of data for the smallholder farmer, for the commodity harvested/available for sale and market prices, it is a challenge to extend Value Chain Finance to the smaller holder farmer.

Value Chain Finance for the farmer and more so for the smallholder farmers (owner and tenant) is a key constraint that impacts agriculture productivity and the overall livelihood of the families associated with agriculture. The possible reasons for this bottleneck span a wide range – informal nature of the agriculture ecosystem, inability of banks to identify low hanging fruits while developing a long-term business opportunity, regulatory constraints, adequacy of human resources to reach out to rural/agriculture markets, etc. As seen from the data above, the scale of the problem is very large - affecting farmers across the entire country. Equally, the knowledge of what works and what has not worked in the area of farmer/agri value chain financing is not widely known.

Innovation in Value Chain Finance offers an opportunity to expand financing for agriculture, improve efficiency and repayments in the financing, and strengthen or consolidate linkages among participants in value chains.

1. http://agcensus.nic.in/document/agcen1516/T1_ac_2015_16.pdf
2. 1 Lakh = 100,000, 10 Lakh= 1 Million, 1 Cr = 10 Million
3. <https://www.thehindubusinessline.com/economy/agri-business/why-small-marginal-farmers-get-just-40-of-total-agri-credit/article25704490.ece>
4. <https://www.businesstoday.in/opinion/columns/warehouse-receipt-finance-a-game-changer-in-agri-finance/story/230003.html>

Why Digital Value Chain Finance Now

There are several factors that are coming together for developing technology led innovations to enable improved access to Value Chain Finance. A few of these underlying trends are -

- a. Rising penetration of technology on the farm is enabling data collection**

With improved access to the internet and availability of inexpensive smartphones, various technologies have reached the farm to enable the collection of farm data and the actions taken by the farmer. These include digital farm management, digital crop advisory, precision farming, livestock management tools, etc. This offers the opportunity to create digital data banks that can be used to support robust financial products
- b. Leveraging the Power of 'JAM: Jan Dhan, Aadhar and Mobile'**

JAM (short for Jan Dhan-Aadhaar-Mobile) Trinity is the initiative by Government of India to link 'Jan Dhan' bank accounts, Mobile numbers and Aadhar(Universal Identity Number) cards of Indians to directly transfer subsidies to intended beneficiaries,

thereby eliminating intermediaries and reducing leakages. This will lay the foundation for data analytics and digitization of transactions of the farmer.

- c. **The proliferation of Digital Payment methodologies, being driven by large players**
Many players, including the government, have created digital payment solutions that are gaining traction. Government has created IndiaStack – “a set of APIs that allows governments, businesses, startups and developers to utilise a unique digital Infrastructure to solve India’s hard problems towards presence-less, paperless, and cashless service delivery.” This combined with new technologies aims to move transactions from cash to digital, enabling digitization of transaction data that can be leveraged for financial products.
- d. **Rise of tech innovators across the Agriculture Value Chain driving the change**
Agri e-commerce companies selling inputs and services to farmers, agri-trading platforms enabling the sale of outputs, agri-fintech startups facilitating credit and risk-monitoring startups using satellite imagery are all contributing to the digitization of the farmers' activities

For our discussions on Value Chain Finance, we invited companies - both established and innovators, that work with farmers on the input and output value chains. The next two sections of the document capture the lifecycle of Value Chain Finance – starting with the funding for the purchase of inputs to financing inventory at farm gate and followed by a section on financing post-harvest activity including aggregation, storage and processing etc.

Section 1: Value Chain Financing at the Farm Level

At the production stage (farm, livestock, etc.), finance is needed for different time frames and purposes. The farmers need finance for the purchase of new inputs that include seeds, fertilizers, pesticides, irrigation water etc. Credit is required by the farmers for the purchase of equipment like tractors and implements, as well as for better management of risks emanating from weather and price fluctuations, etc. Timely credit enables the farmers to hold the agricultural surplus and sell in the market at the appropriate time.

The Challenges of Delivering Financial Products at the Farm level

The suppliers of credit have several constraints while providing loans to farmers. We can divide these constraints into activities of origination of the loan, underwriting, monitoring and collection. To qualify for a typical crop loan from the local bank, the smallholder farmer has to tick several boxes for the bank. This broadly involves being in the vicinity of the bank branch, proving ownership of the land which will serve as collateral, having established credit history registered with the local credit bureau as well as having a banking relationship. Availability of reliable insurance or reinsurance products for smallholders further contributes to banks' comfort with lending. The bank's typical approach is to use assets to securitize loans. Furthermore, small ticket sizes make the transaction cost of lending prohibitive. For these reasons, a large fraction of Indian agriculture lies outside formal Value Chain Finance.

For example, the traditional way of selling inputs is to use a network of distributors and retailers. While individual companies and local administration (agriculture) monitor activities at the district (a sub-region of a federal state in India) level, the visibility of what happens at a particular farm only exists with the local input retailer and that too as anecdotal information. Aggregated data sets at the district level have very limited use for designing or monitoring credit products at an individual level. Similarly, when the output is considered, many processors and the government may have sourcing data history at district levels but on individual farm levels, this is hard to determine. A farm can sell to multiple buyers, price capture for each lot may not be there. Once again for a lender the historical performance is missing and resorting to assets is simpler.

In order to unlock lending, in much the same way that urban India has seen the advent of small ticket working capital finance and salary lending, data on farm transactions is critical. This data should cover all types of expenses – inputs that farmer uses, the historical performance of the farm, visibility of the progress of farming, harvesting etc. Similarly on the output side if the inventory is to be financed then the quality of the output, the shelf life and storage conditions, buying price, and expected selling price needs to be transparent. In addition to typical KYC data, and insurance these data points would help establish credit scores that would help financiers make decisions. Quicker cheaper disbursement and collection would add to the viability of such loans.

Moving from Aggregated Data to Farm Level Intelligence

1. Digital First Platforms Selling Agri - Inputs

New age companies that are selling inputs online aim to disrupt this traditional chain. By engaging with the farmer at an individual level, these e-sellers are able to collect and harness data about the farmer. Agrostar shared their learning from piloting a microcredit/lending product. AgroStar provides high-quality inputs with personalized advisory. Inputs are sold on credit to farmers. Farmer data is collected and the model is used to assign a credit score. This service/product also includes a personalized Agronomist, need-based field visits and loan repayments linked to the harvested crop. By using farm specific information from their technology-enabled distribution platform and supported by field staff, Agrostar is trying to bring bite-size credit for inputs to farmers. Their sales data allows for origination of loans and by using their platform to provide agronomy and market risk information they hope to engage with the farmer to reduce default risks.

There are other models by companies such as Dehaat or Agribuddy that have an intensive engagement with the smallholder farmer with a digitally empowered 'Buddy' or 'Microentrepreneur' that provides inputs, training to the farmer. With the recording of transaction data, these companies aim to facilitate lending to the farmers as having insights on the quality of inputs used, crop health and likely harvest, visibility on the end buyer and likely cash flows to the farmers. These players have a full stack digital platform that enables the collection of data at each stage of the farming cycle right from purchase of inputs, to information and advisory services and also the sale of the outputs.

Bayer Crop Science, a well-established player and ThinkAg Member also discussed how globally they have used innovative ways to provide credit support to the farmers. For example in Ukraine, Bayer has implemented 'Barter Financing.' This involves providing the farmers' inputs on credit and receiving the payment for the inputs in the form of grain at the end of the harvest cycle. In India and Argentina, Bayer has also facilitated loans to a collective of farmers. They use historical data on post-harvest yields as an input to convert the farmers from customers to lifetime farming partners.

2. Developing Robust Credit scores

Companies such as FarmArt and Jaikisan discussed how they are aiming to service farmers by analyzing over 50 proxy data points which could include transactions from the bank

statements, livestock ownership, the behaviour of credit usage etc. By working closely with the community around the farm including village-level retailers, these startups register the farmers, assign credit scores, track usage of credit and access information on harvest incomes. The startups are building 'use cases' of farmers with low rates of default and using that data they engage with banks and financiers on enhancing credit flow. This is a critical intervention that is plugging a gap in the eco-system. To eliminate the issue of credit misuse at the farmer level, the startups are tying up with various retailers from whom the farmers can purchase inputs as well as equipment's using the line of credit issued to the farmer. In this entire process, there is no cash transferred through the farmer's hands. The final settlement for the purchases from the retailer is made directly by the lender on behalf of the farmer. The startups then work with the buyers of outputs, warehouse companies to enable the farmer to repay the loans to the lender which can be a bank or an NBFC.

3. Digital Monitoring Solutions

Traditionally, the financier relies on its field force to track the progress of the crops. This is time-consuming, expensive and often inaccurate. Cropin and Satsure are providing innovative ways to financiers for tracking the progress of the crop. By using a combination of satellite imagery, historical weather and soil data, these companies are able to provide lending institutions access to historical crop performance, the prognosis on timing and quantum of harvest. Several banks are conducting a pilot of these solutions to not only monitor their existing portfolio and also to do research on crops at village/district levels for better risk assessment models.

4. Accessing Cash Flow Information

One critical point that was highlighted in the discussions by the lending institutions was the lack of farmer/farm level data on cash flow and other transactions. While many startups are playing a role in farm to fork, they are still buying from aggregators in the chain. The lack of farmer level transaction data leaves a gap in the development of a more holistic lending model. The innovators in the farm to fork segment can have a significant role to play in the increasing access to finance by providing visibility of cash flows accruing to the farmer.

Platforms such as AgriBazaar are tying up with up local village level aggregators who are trained to aggregate output and sell on their platform to buyers. Access to a platform mitigates the risk of selling the product immediately in the local mandi at an unremunerative price. The farmers and entrepreneurs who visit the platform to sell the output, provide a

range of data about the farm and output. With the transactions taking place on the platform, the associated data points are also recorded. This enables Agribazaar to analyze data for a given farmer's behaviour. Similarly, Dehaat with its network of tech-enabled Dehaat agents is trained to support farmers with inputs and best practices for farming. Dehaat is also providing market access to these farmers which is mitigating the risk of price fluctuation for the farmers. This allows the Dehaat agent to capture data across the farms and farmers in their network.

5. Insurance

While the AgClinic had adequate representation of lenders and other value chains, insurance companies were missing from the conversation. Insurance has a significant role to play in providing cover for operational risks being faced by the producers. It could potentially act as a 'comfort' for lenders thereby improving their risk appetite thereby allowing greater lending at the farm level.

Section 2: Value Chain Financing at the Output Stage

Farmers as well as aggregators, traders and processors have a need to finance the harvest. For farmers being able to hold on to their produce and sell when prices are attractive is an important determinant of their profitability. Traders who buy at mandi or farmgate also want to finance the inventory. Currently, this chain is primarily financed with informal channels - e.g., local money lenders. As farmers get more organized or form groups some financing becomes available. Banks tend to be involved with smallholders when there is a tight control in the value chain and repayment can be assured through the delivery of the crop to an established manufacturer or processor. However, access to bank funding to most SMEs remains challenging.

In the discussions on enabling direct farm buying and the backward linkage that many innovators are attempting to build, the requirement of working capital is a key enabler and many young companies have expressed concerns over the difficulty in raising working capital finance in terms of access as well as cost. These companies/innovators of the supply chain have visibility of cash flows from their retail buyers (who typically buy on credit). They need to provide timely cash flow to the smallholder farmer. A credit facility that supports the mismatch of cash flows will go a long way for the innovators that have demonstrated proof of the business model of supplying from farm to retail.

1. Innovations at the NBFC - Novel Lending Products

Innovative financing institutions such as Samunnati Finance are changing the rules by using a novel approach at the output stage. By engaging first with the buyers of the produce to ensure visibility of cash flows to the lending group. This lending group can be a collective of producers such as large farmers or FPO or procurers of the output such as traders, SMEs etc. The underwriting involves identifying the applicant's 'Social and Trade Capital'. The financial leverage is determined on the 'Buyer-Seller' relationship and the assessment is based on the cash-flows vis-a-vis the asset base.

Samunnati believes it is an 'Internal Value Chain Player' as opposed to a lender who is external to the chain. They follow what they call the 'AMLA' approach - a combination of Aggregation (of demand for inputs and available supply of output), Market Linkage, Financial Intermediation (tailor-made finance solutions) and Advisory. By intervening in these four areas and providing customized flexible tenor and loan amounts, Samunnati is supporting working capital needs and contributing to the overall improvement in access to Value Chain Finance. Samunnati is also working with agtech startups to help improve its processes as well as provide customized financial solutions to the startups operating in the value chain.

2. Warehouse Receipts Financing

Small farmers often sell their produce at the first available price due to the urgency to settle crop loans, to buy inputs for the next crop and for fulfilling family expenditure needs. Storage of crop or delayed selling in anticipation of better price effects will cause a gap in cash flows. The option for such a farmer is to store his produce at an accredited warehouse and use the warehouse receipts to avail a post-harvest loan from the bank which has accredited the warehouse. These loans against warehousing receipts enable farmers to access funds that will go towards their consumption needs and working capital requirements, such as purchasing inputs for the next season and transporting their goods. At the same time, they can monitor market prices and sell their produce, wholly or partly, when the prices reach suitable levels.

For warehouse companies, having data about the farmers in terms of ownership of the produce and ability to grade produce can lead to an increase in the number of warehouse loans given to the farmers. For example companies such as NCML are working with startups that support their needs. Tech startups that provide commodity grading solutions using spectrometry on a smartphone application are being used by warehouse owners and farmers to grade their produce using a smartphone application that uses spectrometry and machine

learning. This allows for a consistent quality assessment and could potentially realise a more appropriate price.

Emerging themes – areas of action.

Data gaps need to be plugged

For improving access to Value Chain Finance, it is critical that all formal stakeholders adopt tech solutions. This will further encourage innovators to hasten efforts in digitizing the needs of the farmers –, especially the small and marginal farmers. The flow of information to the farmer in an acceptable format needs to be worked on. The information should be appropriate and actionable. This two-way exchange of data will make the lender more comfortable in doing a risk assessment.

Scaling and adoption of tech solutions by innovators is critical for the lending landscape

There is a clear recognition among corporates, banks and financiers to work together with innovators. However, most are unable to work with these innovators on account of incompatibility of data sets, reliability of data sets, and limited geographical spread of the data sets. Innovators on the other hand also face an issue of access to capital. In spite of seeing an increased venture capital funding in the space, finance for most startups remains a challenge. For example, banks are not forthcoming in lending to startups working in the value chain. In such a situation, public finance institution such as NABARD should step in with innovative schemes like credit guarantee, etc. There could be a common online platform where such information is disseminated and lessons learnt are shared.

Partnerships for pilots between innovators and finance players can pave the way forward for the adoption of new technologies by the industry

A unique partnership has emerged where a ThinkAg corporate member will provide credit guarantee for a startup seeking a line of credit from a financial institution. The financial institution is in-turn using the startup's solution to monitor and track its loan portfolio on the field. Banks must come forward to facilitate these partnerships to enable more adoption, learning and facilitating scaling of the game-changing solutions

Annexure 1: Participants at the AgClinic

Agri Corporates	Innovators	Banks and NBFCs	Investors
BASF	AgroStar	Samunnati	Omidyar Network
Mahindra & Mahindra	Farmbee	Yes Bank	Bharat Innovation Fund
Monsanto Bayer	Jivabhumi	RBL Bank	Blume Ventures
Srinivasa Farms	S4S Technologies	Ananya Finance	Incofin
Covestro	Superzop	Samaaru	Bill & Melinda Gates Foundation
Olamnet	FarMart	DBS	Aspadaz
	Cropin	Rabo Bank	
	WayCool	Dvara	
	Jai Kisan	FSDD NABARD	
	Our Foods	Nabkisan	
	Impagro		
	Digital Green		
	AISHWARI Agro Foods		
	MeraKisan		
	Just Organik		
	SatSure		
	Gramophone		
	Niruthi		
	Agribazaar		
	Farmguide		

The ThinkAg (www.ThinkAg.in) platform is a network of leaders from the food and agriculture industry created to increase adoption of new technologies and operating models by businesses in food and agriculture. The platform enables collaborative partnerships between start-ups across food and agriculture value chain and established companies engaged in the input, output, financial services, technology dimensions of the value chain.

Disclaimer: The views expressed in the paper reflect the proceedings of the AgClinic roundtable held on 9th May 2019 and do not purport to the reflect the views of ThinkAg or any of the participants.