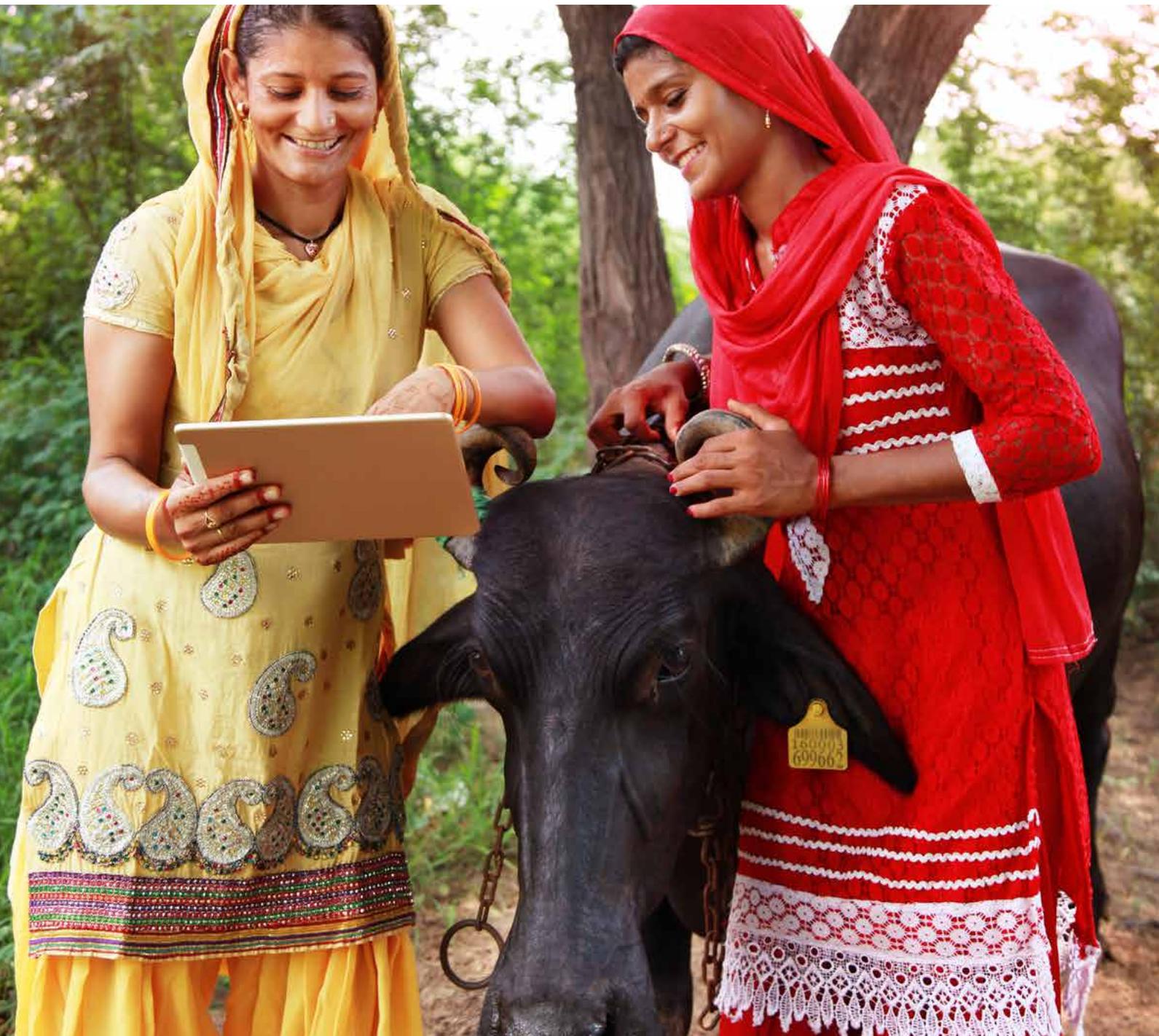
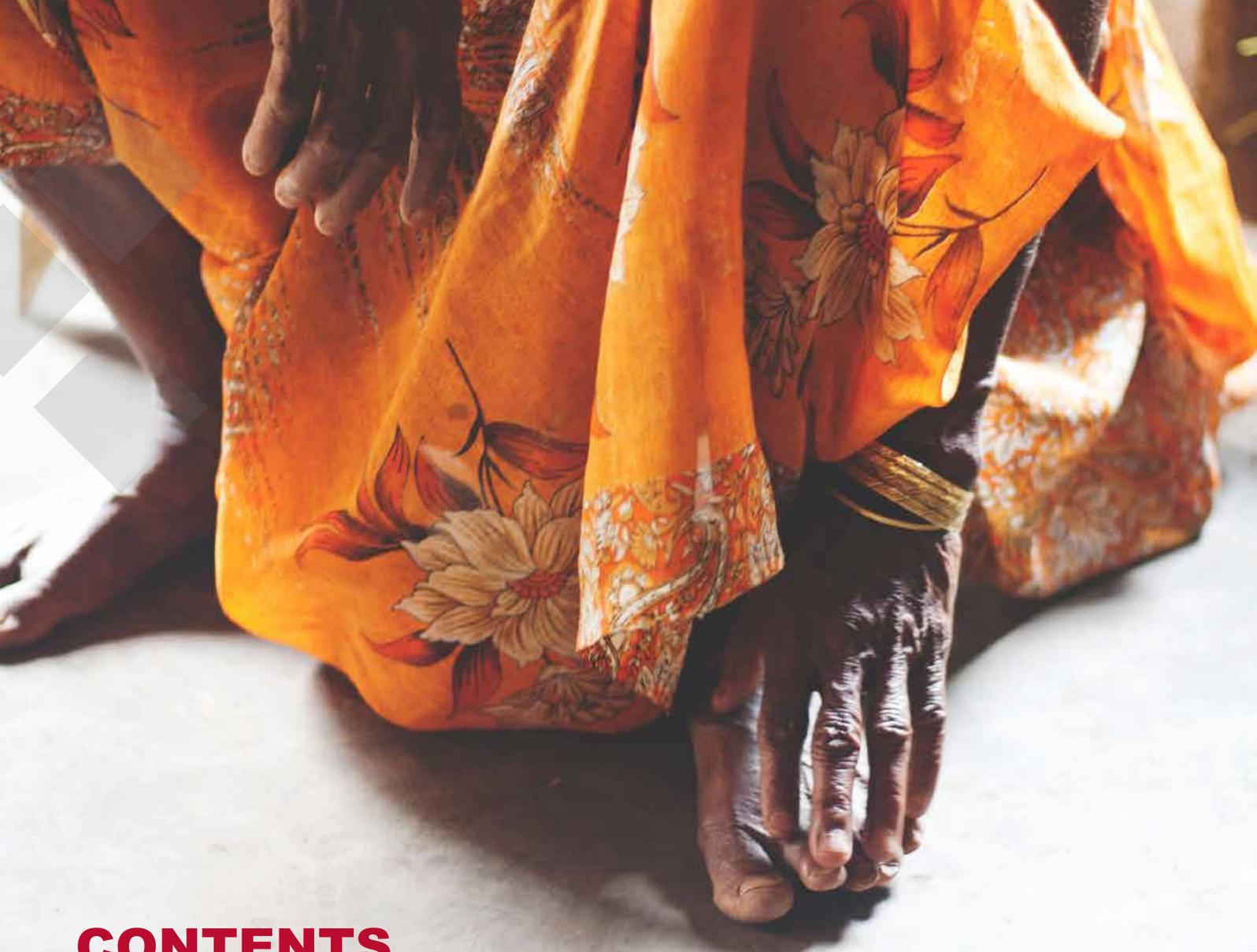




Digitizing Rural Value Chains in India: An Assessment of High Potential Opportunities to Increase Women's Economic Empowerment





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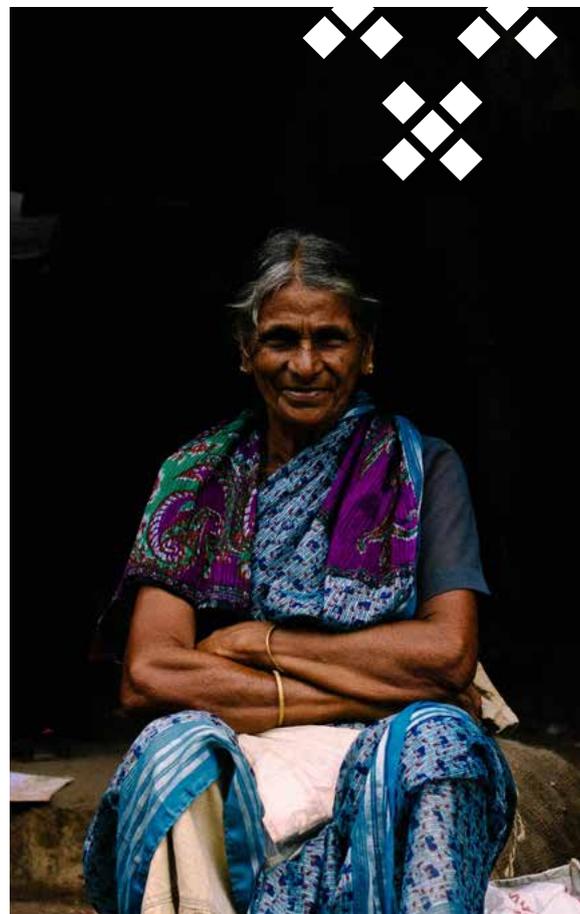
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The views expressed in this publication do not necessarily reflect the views of USAID or the US Government, FHI 360 and its board of directors or the governments they represent.

List of acronyms used

ACH	Automated Clearing House
AEPS	Aadhaar Enabled Payment System
BC	Business Correspondent
BHIM	Bharat Interface for Money
C2B	Consumer to Business
CAGR	Compound Annual Growth Rate
CASA	Current Account and Savings Account
DFS	Digital Financial Services
DME	Directory Manufacturing Enterprise
F&B	Food and Beverages
FGD	Focused Group Discussion
FMCG	Fast Moving Consumer Goods
FSPs	Financial Service Providers
GDP	Gross Domestic Product
ICT	Information and Communication Technology
IMPS	Immediate Payment Service
INR	Indian Rupee
JLG	Joint Liability Groups
KYC	Know Your Customer
MFI	Microfinance Institutions
MSMEs	Micro, Small and Medium Enterprises
NBFC	Non-Banking Financial Company
NFC	Near Field Communication
NGO	Non-Government Organization
NPA	Non-Performing Asset
NTFP	Non-Timber Forest Produce
OAME	Own-Account Manufacturing Establishments
OBC	Other Backward Class
P2M	Person to Merchant
P2P	Person to Person
PoS	Point of Sale
PSP	Payment Service Providers
SC	Scheduled Castes
SFB	Small Finance Bank
SHG	Self-Help Groups
SMEs	Small and Medium Enterprises
ST	Scheduled Tribes
UPI	Unified Payments Interface
USD	United States Dollar
USSD	Unstructured Supplementary Service Data
VLE	Village Level Entrepreneur





EXECUTIVE SUMMARY

Women’s empowerment has been the focus of the Indian government with initiatives such as the Support to Training and Employment Programme for women (STEP) and One Stop Centre Schemes aiming to support gender equality in India. Women’s equality and empowerment is covered under the Sustainable Development Goal (SDGs) number five and is integral to all dimensions of inclusive and sustainable development. Women’s empowerment through financial inclusion is an important step towards achieving SDG-5 and gender equality as it can accelerate progress towards better financial literacy and poverty reduction among women through the more efficient use of household income and expenditure by increased access to formal financial services.

Digital Financial Services (DFS) can expand the delivery of basic financial services to each segment of society through innovative technologies, such as mobile phone enabled financial solutions, point-of-sale devices, electronic money transfers and digital payment platforms. DFS channels can drastically drive down costs for customers and service providers as well as offer services at greater convenience and scale, opening the door to offer services to underserved populations.¹ Women could be major beneficiaries of DFS as it would give them better access to, and allow them to control the household income. In addition to this, DFS has the potential to enhance their ability to make financial decisions, especially on savings and investments.



SDG 5 focus

Empowerment of women through financial inclusion using digital financial services.

How DFS enables women empowerment

Digital Finance Services (DFS) offer a platform for women to gain access to financial products and value added services to overcome the lack of time and mobility due to household responsibilities and cultural norms seen in many developing countries, such as India. DFS channels also allow women to have greater control over household spending and financial decision-making and gain more trust and respect within the household and the community. Moreover, the use of digital mediums for communication, such as making phone calls or composing messages to provide or seek information, can give women a sense of belonging and can make them feel more connected to the community.

❖ Context and Objective

In November 2015, USAID announced a significant commitment to support financial inclusion in India with a focus on acceptance of digital payments and convenience of use of DFS among merchants and end customers. As a part of this initiative, USAID provided funding to FHI 360 through the Mobile Solutions Technical Assistance Program (mSTAR) to support the digitization of rural value chains in India that could deliver viable and sustainable solutions for low-income communities. Global development consulting firm Intelicap was selected to lead the implementation of this work. The objective of the of the assessment and

its associated pilots is to identify and digitize rural value chains or transaction ecosystems, where high volumes of financial transactions occur, representing potential for digitization. The project aims to expand the acceptance and use of digital payments between value chain actors and key beneficiaries at the point of financial transaction in rural communities. Women have been identified as the key beneficiaries of this initiative as they play an important role in rural ecosystems both as workforce or labor on farm/non-farm related activities and as entrepreneurs providing livelihood opportunities.

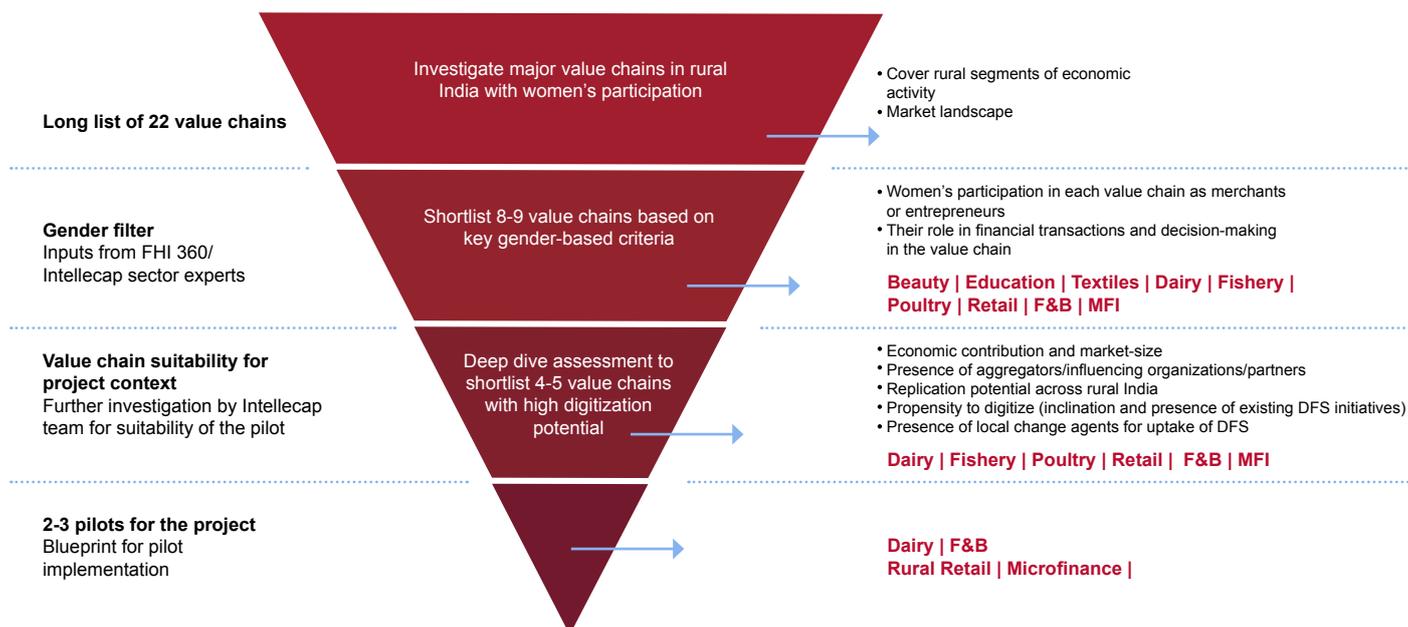
¹DFS Expand the Delivery of Basic Financial Services to the Poor, AFI Global

Assessment methodology adopted

Intellicap adopted a three-step filtration process to select the rural value chains for deep dive and digitization pilot selection.

- The first step involved examining multiple rural value chains in India with significant women participation. This activity was conducted based on secondary research from gender-based and rural ecosystem assessment reports, economic census data, MSME survey data analysis and interviews with a few rural and livelihood experts. Based on this assessment, 22 rural value chains were identified for detailed assessments.
- The second step involved shortlisting 8-9 value chains based on rural women’s participation in the value chain as merchants or entrepreneurs and their role in financial transactions and decision-making. This activity was carried out through a mix of secondary sources (reports and articles) and primary visits to different locations across several Indian states, to analyze each respective value chain. Based on this assessment, dairy, poultry, fisheries, rural retail, apparels & textiles, food & beverage manufacturing, beauty & wellness, education and microfinance sectors emerged with promising trends.
- Each of the eight shortlisted value chains were assessed based on their economic and replication potential, transaction intensity and presence of local change agents. After applying the filtration criteria, two value chains: dairy and food & beverage manufacturing were selected as priority value chains for high impact DFS interventions. Furthermore, rural retail and microfinance were identified as ‘enablers’ for these DFS interventions.

Rural value chain selection process



Upon shortlisting four value chains for deep dive analysis, the Intellicap team conducted primary visits and interviews to build upon the key findings from secondary resources, as well as to validate the initial hypothesis developed for women participation, the role of key stakeholders and to evaluate opportunities to integrate Digital Financial Services (DFS) into each value chain. A total of seven rural locations across India were selected to study and analyze these core value chains. Intellicap's project assessment team interacted with a mix of women and men farmers, women entrepreneurs and other

small merchants/rural store owners to obtain insights. Moreover, interviews with important stakeholders such as value chain partners, payment technology companies and financial services providers were conducted to develop a crucial understanding about value chain operations and specifically women's role in the value chain. In total, the assessment team captured inputs from nearly 100 women and men farmers, women entrepreneurs and other small merchants/rural store owners as well as 10 sector experts.

Key findings

The dairy value chain has high participation of women in rural areas and has significant DFS potential to direct payments to dairy farmers' bank accounts to target large-scale interventions. However, low literacy levels, and limited financial awareness and knowledge about digital transactions are barriers to digital interventions.

The dairy sector contributes nearly 18% to agricultural GDP in India and provides livelihood opportunities to more than 75 million women, making it a key sector for catalytic interventions that can economically empower women in rural India. Women dairy farmers have varying roles across the value chain and in financial decision making, indicating a need for customized DFS solutions. The value chain represents a mix of cash and digital payments, the latter being a more common mode adopted by large cooperatives and organized private dairies to make payments to farmers or collection agents. While the women dairy farmers met during this assessment had access to mobile phones, there was limited awareness of DFS channels or cashless transactions. This low awareness and the knowledge gap about making digital payments is a potential barrier to DFS implementation among women in the dairy value chain in rural India.

Food & beverage (F&B) manufacturing in India involves millions of women enterprises usually operating at the household level. There are significant DFS opportunities in Person-to-Person (P2P) transactions between women customers and merchants, as well as digitizing savings and lending. Low confidence in DFS and knowledge gaps on digital transactions are some of the key barriers.

The majority of food & beverage enterprises in rural India are Own-Account Manufacturing Establishments (OAME) serving diversified customer segments, which indicates the need for bespoke financial and DFS solutions. Women in the F&B sector may either work as independent entrepreneurs or supporters in the activity with varying motivations to adopt technological platforms for financial transactions or decision making. The bulk of payment transactions in the F&B value chain are cash dominant with varying purchase frequencies. This implies a possible role for DFS providers to better integrate and manage financial transactions. Mobile phone ownership and usage among F&B entrepreneurs is similar to what is observed among dairy farmers, although more smartphone ownership is found among women in the F&B sector. The high volume of P2P transactions in the F&B value chain is often recorded using legacy methods,² making it difficult to keep a track of the transactions. DFS solutions, in this sense, can offer a convenient way to record, store and retrieve the transaction information.



² Such as manual recording of transactions in a notebook or a cash register

The analysis of different rural value chains indicates that rural retail and microfinance are common intersections for financial transactions for rural women but what remains relatively uncertain is the influence of these segments on rural communities as enablers of change.

Rural retail and microfinance are deeply embedded in the rural ecosystem and contribute significantly to the constantly evolving rural landscape. Retail stores and microfinance institutions (MFIs) have been successful in making deep inroads into the hinterlands of the country as institutions, and hence have built a strong association with the populace. For instance, retail stores within rural villages are accorded special importance as information and knowledge exchange hubs and as a high volume financial transaction-point linked to actors of multiple value chains. In terms of women's participation, rural retail has emerged as a strong option for women to take up roles as village level entrepreneurs (VLE) and 'own account workers' to build last-mile linkage for fast moving consumer goods (FMCG) companies. Similarly, MFIs have been specifically set-up to serve underdeveloped communities in accessing institutional finance largely due to the intermittent nature of the source of income and cash flows, as well as the absence of a financial transaction history. This also implies that MFIs have the ability to operate across rural value chains and have an extensive network of agents that physically connect with rural communities on a daily basis. Moreover, since most of the MFIs have an internal digital base of operations, they are perfectly positioned to integrate with digital solutions externally, leveraging self-developed or off-the-shelf solutions.

Our assessment revealed a preference for cash-only transactions across rural value chains which are largely due to the inter-connected nature of the rural economy with cash being a convenient mode of exchange in both backward and forward supply chains.

It is important to note that post demonetization in India in November 2016, the shift of urban consumers and merchants to digital payments was not instant or even streamlined. There were fears of losing cash through incorrect transactions and issues such as not having enough merchants with the facility for accepting digital money. This process is more tedious for rural women who have not been exposed to the level of technology and education as their urban counterparts. Moreover, an oft-occurring perception among women (and men alike) is that for the small-value transactions that they deal in (in business or consumption spending) on a daily basis, cash payments are more suitable than any digital means.

DFS opportunities

Nearly all the rural women covered in this assessment owned a basic or feature mobile phone or had access to a mobile phone through a family member indicating a good potential of DFS solutions such as USSD banking and MicroATMs in rural settings.

However, our interaction with the rural women indicated

that less than 5% of the women had completed a financial transaction using a mobile phone though nearly 30% had either heard or were aware³ of DFS solutions. The lower usage of DFS is largely due to limited awareness about digital means of spending, low confidence to make online or mobile payments, fear of losing money due to limited understanding of the technology or the back-end financial transactions and lack of digital options in the value chain or in ecosystem spending.

DFS has significant potential to not only extend financial inclusion in rural areas but also digitize core areas of multiple value chains.

In dairy, for instance, there is a noticeable opportunity to digitize payments made by dairy enterprises against the sale of milk with benefits like efficient record-keeping/book-keeping. Currently, payments are routed via Milk Collection Centres (MCCs), which lead to a delay in payments for the dairy farmers as well as a high cash-carry risk for the organizations. By digitizing these payments, enterprises can transfer the amount to each dairy farmer directly. As individual payments are digitized, enterprises can also digitize the book-keeping/record-keeping of milk collection through interventions such as SMS updates, Unstructured Supplementary Service Data (USSD) platforms and even a customized mobile app for financially well-to-do farmers. Similarly, in the food & beverage industry, there is a high volume of peer-to-peer transactions that are currently manually recorded. There is a significant opportunity for financial service providers (FSPs) to digitize these transactions through interventions such as USSD or SMS based payments platforms. These transactions would then be recorded on a digital ledger and would be easily accessible for merchants and producers respectively, thereby improving the level of record-keeping. Additionally, through digitization, FSPs can also aim to finance the credit requirements in the F&B industry. FSPs would be able to leverage alternate digital data available to them as a result of digitization to better assess customers and extend more affordable and appropriate credit.

In order to drive the digitization agenda across multiple value chains and at rural ecosystem level, there is an inherent need for FSPs to drive the financial inclusion agenda.

Since digitization of payments mandates the use of a primary bank account through which all income and expense payments are made, it is imperative for FSPs to also serve banking products to these unbanked customers. In cases where accounts might be present, FSPs could then drive their uptake and usage to ensure that rural customers are not only financially, but also digitally included in the formal financial system through savings, credit and payments.

Please note: The key findings of this assessment report are based on the data and information collected and analyzed during primary interactions with restricted sample groups in the selected geographies and are not representative of the overall picture or findings at the PAN-India level.

³Through television or radio advertisements or through the young adults/youth in the household

❖ 1. Digitizing Rural India

1.1 India digital landscape

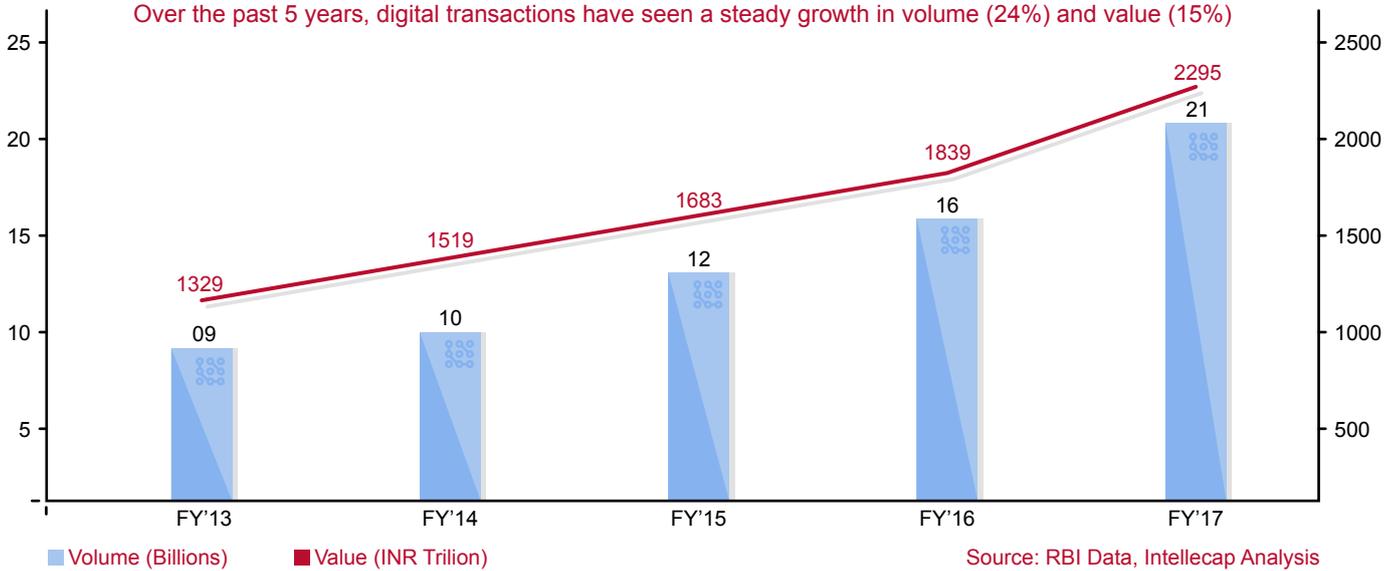
Over the past five years, the payment landscape in India has mirrored developments occurring in the global payments arena, albeit with a time lag.

Beyond the synergy of market factors and proactive government policies, digital payments have flourished due to their unique value proposition of convenience of use and high level of transaction security.

The focus on digitization of financial transactions in India is a relatively recent phenomenon; the trend points towards growth especially in payment transactions. Since 2012-13, the volume of digital payment transactions has grown at ~24% annually, while the value of transactions has increased at an annual rate of 15% during the same period. This growth in digital payment transactions reflects the overall blooming mobile banking and prepaid payment instruments (PPI) market in India. Mobile banking transactions have grown from 2012 to 2016 at a CAGR of 94% to 387 million transactions per year. This has also been supplemented with an exponential increase in the value of transactions; over 306% (4-year CAGR) to INR 4 trillion and a 10x growth in the average transaction value.⁴ Mobile wallets are the largest category within PPIs; however, the segment also includes prepaid cards and other paper vouchers.

Growth of Digital Transactions in India

Over the past 5 years, digital transactions have seen a steady growth in volume (24%) and value (15%)



Why is digitization of financial transactions important for India

Digitization holds the potential to extend financial inclusion beyond brick-and-mortar branches of banks and promote the use of formal financial institutions at the grassroots level with the help of technology. In this regard DFS not only aims to digitize existing transactions such as income, payments and peer-to-peer transfers, but also enables the development of stronger financial profiles and credit scores on the basis of alternative data such as transaction history and bill payments. Through digitization, improved access to formal financial products and services can be enabled in shorter time at a reduced cost, thereby accelerating financial inclusion. Moreover, customers can reduce wastage and misuse of income and safeguard themselves against cash risk such as counterfeit currency notes, theft or loss of money.

While the use of cash itself does not give rise to any widespread challenge, it is widely accepted and understood that the use of digital payments provides a more comprehensive and efficient system with clear benefits.

A few generic challenges associated with the use of cash include the associated risk of carrying cash in the form of theft or damage. This is especially rampant across rural areas where old notes are high in circulation and relative level of policing and security is low. Further, it has also

been observed that the prevalence of cash often gives rise to impulsive and wasteful expenditures and challenges in accounting. The key drawback of the prevalence of cash is the resultant lack of banking and financial history of rural consumers. This limits banks' ability to extend more appropriate products to them and serve the full range of their financial needs. As a result, rural consumers are forced to borrow from informal money lenders who charge exorbitantly high rates of interest (as high as 1% rate per day) and are often trapped in the credit loop.

⁴RBI Data, Intellicap Analysis

The growth of digital payments in India has been driven by market conditions and need as well as technology advancements in payments. The central government has proactively taken key initiatives such as the JAM unified payments interface (UPI) and diversifying banking licenses to promote digitization across India.

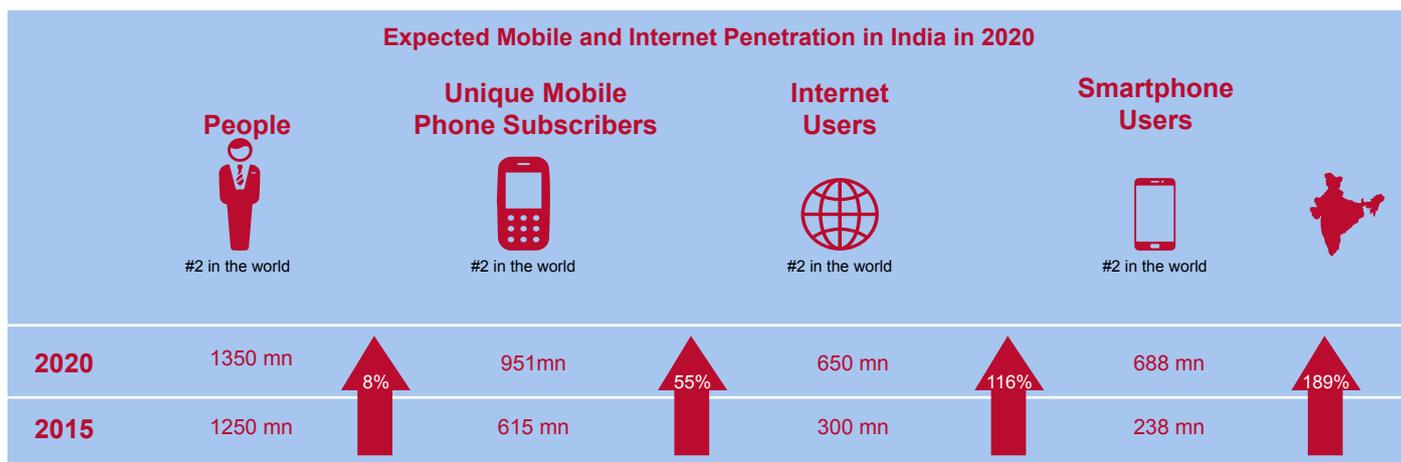
A combination of digital native expectations and the government's desire to boost financial inclusion and reduce the use of cash is fueling rapid growth in electronic payments and bringing a new breed of mobile and fintech innovators into the payments market. The digital payments landscape has undergone a disruption with new market entrants and adoption of technology. Some of the recent startups such as Money Tap, India's first app-based creditline and PayKey, a P2P payments app wherein users can link their bank accounts and

transfer money to their contacts list on social media directly are some examples for the new trend of mobile and fintech innovators seen in India. Moreover, market factors, such as a young and technologically inclined demographic of India is driving digital payments. This young generation is tech-savvy, which has transformed digital solutions from being a convenience to an essential part of how people transact. However, rural community members, especially those above the age of 35 require a more training based, assisted approach on the use of digitization channels to build their confidence in DFS for sustained use.

Increasing availability and data network infrastructure have facilitated in creating the ideal market conditions for the growth of digital payments.

India is rapidly evolving into a digital beehive with over 616 million unique mobile phone subscribers.⁵

Furthermore, the internet network has seen a significant expansion with 3G or 4G penetration even in the most remote parts of the country. The National Optical Fibre Network (NOFN) initiative by Digital India is set to provide broadband connectivity to cover 250,000 Gram Panchayats across rural India.⁶ Currently, 70% of rural users access the internet from their mobile handsets. In this regard, the initiative aims to drive an increase in adoption of data-enabled devices in these areas. Such developments across the country are only expected to expand as the number of internet users are expected to double to 650 million between 2015 and 2020.⁷ With a year-on-year mobile internet growth rate for rural areas at 26% vis-à-vis 9% for urban areas,⁸ one can expect that the majority of the new internet users are from rural areas. Thus, this expansion of network, internet and mobile penetration creates ideal market conditions for digital payments to flourish, especially in rural India.

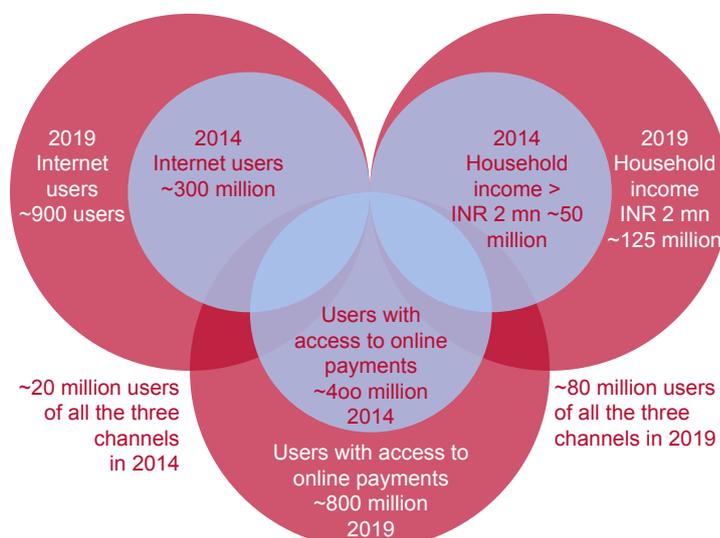


Source: GSMA Mobile Economy India, 2016, eMarketer, Ericsson, UN estimates



These macro-factors across favorable demographics, rising household incomes and increasing mobile phone and internet penetration create the perfect market for the expansion of digital payments as more and more consumers are not only exposed to, but also have access to, online payment options.

Users with access to online payment options are set to double between 2014 and 2019



⁵Mobile Economy India Report 2016 by GSMA. June 2016 statistics
⁶Targets under the National Optical Fibre Programme

⁷Mobile Economy India Report 2016 by GSMA. June 2016 statistics
⁸Mobile Internet in India, IAMAI report 2017

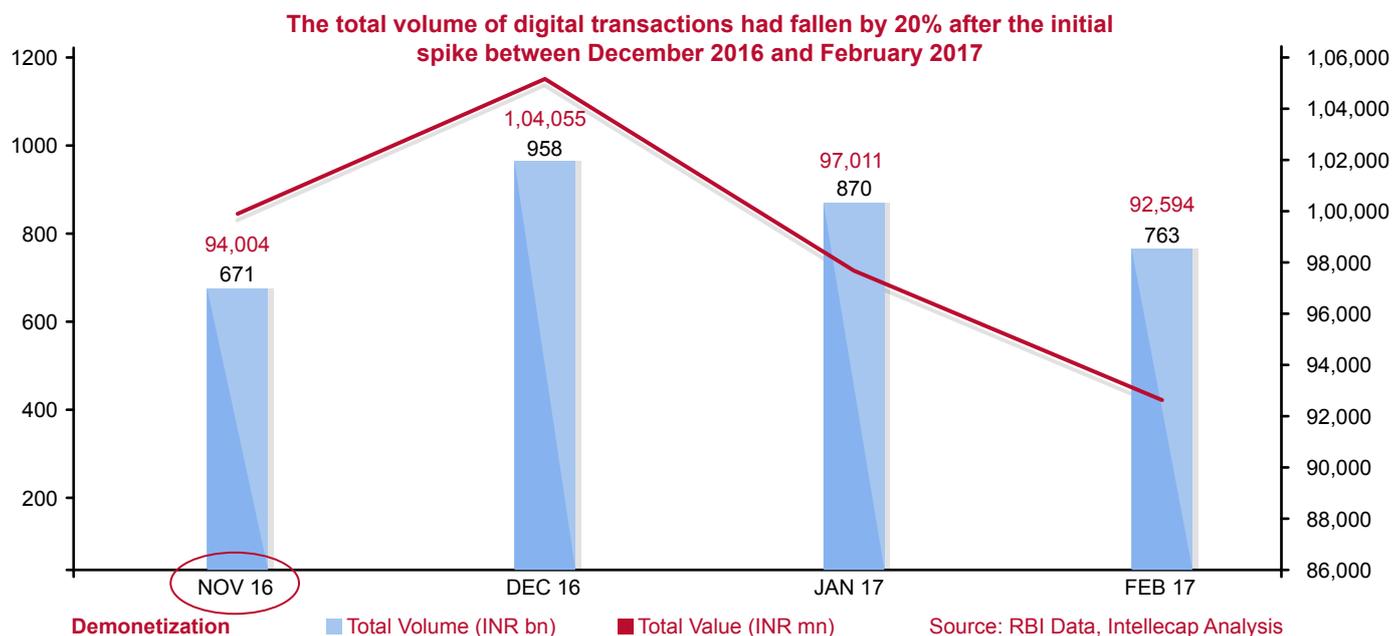
Demonetization was a watershed moment in the Indian financial system that marked an increase in digital payments as the Indian government pushed for digitization.

In order to drive digital payments uptake and to bring about behavior change around less use of cash, the government of India in 2016 demonetized INR 500 and INR 1,000 currency notes, which accounted for over 80% of the bills in circulation. Non-cash payments saw a surge immediately following the demonetization policy enacted in November 2016, when the cash in circulation fell by two-thirds. Digital transaction volumes grew by 43% between November and December 2016, driving hopes that the shock would kick-start India's transition to a cashless economy. Monthly average transaction of digital payment companies also increased from INR 30 billion to 68 billion as small traders and shopkeepers shifted to electronic payments due to the increasing demand from customers and were forced to install point of sales (PoS) machines and subscribe to wallets in urban areas. In between the months of October and November 2016, the average volume of PoS transactions increased by 92% to 9.8 million and the value of these transactions grew by 43% to INR 175 million.⁹ In the immediate months following demonetization, USSD, UPI, e-Wallets and Ru-Pay Cards Platforms saw the greatest increase amongst the digital payment modes due to their relatively simpler architecture and greater mass appeal.

However, one year later, cash still remains as the primary payment method in India, as digital payments failed to sustain their growth rate in the period immediately following demonetization.

The first signs of resurgence of cash were seen as early as January and February 2017, only 2 months after demonetization, as cash availability improved across banks. In February 2017, the volume of transactions using digital channels had already significantly decreased as compared to December 2016. Mobile banking alone had fallen by nearly 40% in the period of one month (i.e. January 2017). This trend continues. Despite a 113% year-on-year increase in the volume of transactions since November 2016, there has been a 23% decrease in value suggesting mobile banking is now primarily being used for smaller ticket sized transactions.

The high prevalence of cash became even clearer in the months following as the total volume of digital payments continued to decrease month-on-month. Today, the level of cash in circulation is back to its pre-demonetization levels. The total currency in circulation as of February 2018 was INR 17.78 trillion, 99% of the INR 17.94 trillion which was in circulation pre-demonetization.¹⁰



1.2 Opportunities and challenges to India's financial digitization

Despite the initial growth of digital payments during demonetization, the sustained uptake of DFS products and services has been low with customers in rural India more likely to drop off from the use of DFS channels.

- Consumers in rural areas have a relatively lower level of education and use 2G-based feature phones as compared to those residing in cities. Thus, in the absence of extensive digital literacy training or any form of assisted modes of digital payments, the complex digital payment options such as UPI, QR, BHIM have overwhelmed consumers and kept them away.
- The absence of vernacular languages in feature phone-based digital payments mechanisms, such as USSD, was a showstopper as well. USSD 1.0 itself was not a reliable platform and failed to achieve the adoption and usage that was first expected. This was primarily due to limitations in the architecture, lack of reliability in transaction processing, and command prompt errors.

⁹ RBI Data, Intellicap Analysis

¹⁰ RBI Data, Intellicap Analysis

- For consumers, the lack of mass use cases such as public transport and a comprehensive digital rural spending ecosystem means the attractiveness of holding their money digitally was low. Most consumers found it inconvenient to receive their income digitally as there were significantly limited avenues to spend digitally especially in the concentration of PoS machines in rural areas.

- One of the key reasons for insufficient PoS machines has been due to the low adoption of these machines amongst merchants. Merchants found it cumbersome to sign up for PoS due to extensive KYC requirements and the unfeasible economics around small payments via the device. Further, the transaction fee charged by PoS payment providers in the range of 1-3% also played a significant role in pushing merchants to continue using cash.

- Demonetization led to an 'artificial' drop in demand for cash as more cash was made available. This was most symbolically seen in Dhasai, one of India's digital villages - where initially after demonetization, 90% of the payments had gone cashless, but today that number has dropped to a mere 15%.¹¹

These reasons in conjuncture have created the ideal environment for cash to be readily adopted and used again once it was re-introduced sufficiently.

One of the most important success factors for better DFS adaptability is the ability of financial institutions to adopt and maximize the use of technology enablers.

Technology advancements and innovations introduced by financial institutions are critical in serving rural customers in a more affordable and convenient manner. Financial institutions can look to developing and incorporating the following technology enablers within their operational model and processes.

Near-Field Communication (NFC): NFCs traditionally have not been very successfully in the Indian context on account of associated costs with embedding them in smartphones as well as merchant terminals. However, other forms of contact-less payments that have worked in emerging markets like China may be more appropriate and are starting to find the application. In India, ToneTag uses an NFC-based on soundwaves wherein merchants can transmit the bill amount and details via an audio signal. Customers can then authenticate the payment using their PIN on their phone keypad.

Quick Response (QR) Code: QR Code technology typically refers to a matrix barcode encoded with information and readable by smartphones. The use of QR code technology can make PoS mobile payments convenient. Customers would just need to flash the mobile app with the QR code at check-out which can be read by the merchant and accordingly the amount can be debited from the customer's wallet/account. The potential to use QR Codes for payments in India was expanded by the introduction of Bharat QR Code which combines all major independent QR Code platforms such as VISA, Mastercard, Rupay and American Express. This has led

to the emergence of start-ups such as Kissht, which offers 'Scan and Pay Later' credit wallets wherein customers can shop using the 'Kissht QR Code' alone.

Biometrics: Advancements in biometrics have also enabled financial institutions to develop interventions such as Micro ATMs and Kiosk Banking. These are designed specifically keeping the rural customer in mind and aims to increase the adoption of digital financial services by overcoming barriers around the difficulty of financial transactions (such as remembering multiple passwords and PINs) and making it more convenient for customers to use. FinTechs such as Oxigen have partnered with mainstream commercial banks in India, such as State Bank of India to deploy Micro ATMs amongst its business correspondent network to extending banking service to areas without bank branches.



Voice-Based Authentication: Banks and PSPs are also exploring offering solutions that enable customers to log in and pay through voice-based authentication. This would mean that customers no longer need to enter a PIN or a password while transacting and payment platforms can compare stored voice recordings to verify each transaction through a simple voice phrase. Although still in infancy, ICICI Bank has successfully piloted the application of voice-based authentication through its remittance app-Money2India. This, combined with vernacular language integration, would allow aged and less literate customers to easily adopt such services and further drive penetration.

Big Data Analytics: With the adoption of big data analytics and artificial intelligence, financial institutions are leveraging the increasing digital footprint of the rural customer through the digital initiatives to improve their credit underwriting process and adopt a more flexible pricing approach. These are making financial services more affordable for customers based on a better understanding of their financial transactions, such as bill payments, mobile recharge, as well as income patterns. Fintechs such as Tala are leveraging these advancements to extend micro-loans on the basis of alternate data-based customer ratings.

¹¹Country's first cashless village goes back to cash, The Indian Express, November 2017

For the Indian rural context, technological interventions such as the use of Biometrics in Micro ATMs and vernacular language-based USSD platforms have the greatest potential for DFS uptake.

Micro ATMs for instance, are essentially card swipe machines with a biometric fingerprint scanner that is linked to the Aadhaar Enabled Payment System. Through micro ATMs, a bank can remotely connect to its core banking system and enable customers who cannot reach bank branches to conduct transactions such as deposit, withdrawal, payment and balance inquiry.

Digitization has the potential to not only transform the way rural India financially transacts but also play a critical role in driving financial inclusion initiatives	
Opportunity areas for DFS in rural India	Drivers for DFS adaption in rural India
<ul style="list-style-type: none"> ● Direct payments from farm produce or livestock production in farmers bank accounts ● Extend access to formal credit through alternate modes of credit assessment ● Bundle value added financial services such as crop and cattle insurance ● Increase rural Current Account and Savings Account (CASA) usage ● Digitize segments of rural household spending <ul style="list-style-type: none"> • Over 50% spending in unorganized retail • Over 20% spending in transportation • Over 10% rural household spending on bills & utility payments 	<ul style="list-style-type: none"> ● 50% of the population of India is below 30 years of age and technologically intelligent ● Mobile phone subscriber penetration is 54% and mobile internet is 30% ● Nearly 100% Aadhaar penetration along with the new two factor authentication and simple KYC regulations ● Use of biometrics in authenticating transactions as in micro ATMs ● Use of vernacular language in payment platforms as in mobile apps & USSD



These are initial use cases that can be seen across rural areas. However, there is a need for a more cohesive ecosystem-based approach.

These initial interventions in digital payments and financial services are spearheaded by large-scale private and public sector banks and payment banks. Other financial institutions such as small finance banks, microfinance institutions and non-banking financial institutions have also tested initial pilots. These interventions, however, are currently operating in siloes and are not comprehensive across the multitude of challenge areas that deter a rural consumer from going digital. Solutions led by banks such as ICICI Bank's digital villages initiative, as well as SBI and IDFC have focused on extending banking services through USSD, kiosk banking and micro ATMs to build a stronger rural current and savings account book. On the other hand, payment banks such as Paytm and payment fintechs such as Oxigen have focused on extending mobile PoS and USSD-based payments platforms. In addition to this, lending FinTechs aim to develop extensive credit scorecards that focus on SME and MSME customer segments through the use of alternative data such as bill payments, mobile recharge and other sources.

THE RURAL VALUE CHAIN OPPORTUNITY

❖ 2.1 Role of Women in Rural Livelihoods

Women in rural India contribute significantly to farm labor and are also increasingly participating in managing business and household spending.

Development of the rural woman's capacity for income generation can only be done through cognizance of gender dynamics at the household level. This is instrumental to their empowerment. Rural women are one of the most vulnerable groups when it comes to security of their livelihoods and finances due to little exposure to formal financial institutions, education or technological innovations that are necessary for their socio-economic development. Digital financial services can assist women in gaining better control over their earnings/expenses and keep them well-informed on financial decisions. Not only this, such financial inclusion can lead to induced savings for women (as a result of less cash-in-hand). Moreover, women with greater financial control are likely to spend more on necessities such as the education and health of the family, indicating advancement in the household.¹²

Representing 9% of the total establishments in India, rural women entrepreneurs employ nearly ~8.2 million people, indicating their significant role in livelihood creation.¹³ Unregistered informal businesses dominate the rural landscape in India.

The livestock value chains such as dairy, meat and poultry have the highest share of women establishments (formal and informal) in India, followed by manufacturing and retail trade. These three segments constitute nearly 80% of the total women establishments in India.¹⁴ Rural women in India have an appreciable, albeit under-stated presence, in all facets of rural life largely due to deep-rooted power structures in favor of men. From cultivation of crops on farms, livestock management in dairy, goat farming and poultry, manufacturing of food and beverage products, skilled labor in apparels and textiles and beneficiaries in the microfinance industry, women shoulder tremendous responsibility in building the rural economy.



Rural women, therefore, need to be at the fulcrum of activities around digitization of the rural value chains, digitization of the households and the financial transaction ecosystem around them.

Rural women were observed to have superior social skills, better control of the household expenses and therefore, have a comparative advantage when their social skills are complemented with knowledge on digital literacy.¹⁵ Digitization of the rural households and the financial ecosystem, at least at the village level, certainly need digital empowerment of women.

Digital inclusion of women has the potential to empower them to make better financial decisions and also drive value chain and household consumption spending.

Rural communities, especially rural women are largely under-served as far as formal financial services like savings, credit and insurance are concerned.

¹²Women and financial inclusion, CGAP. www.cgap.org/topics/women-and-financial-inclusion

¹³Economic Census 2014-15

¹⁴Economic Census 2014-15

¹⁵Based on primary interactions with key stakeholders

The infrastructural gaps, high operating costs and the resulting infeasibility of business models limit the operation of brick-and-mortar based financial institutions in such areas. Digital financial solutions such as mobile money, Micro ATMs or USSD-based financial transactions can potentially provide easier access to money-transfer services, micro-loans and insurance. This can revolutionize the financial landscape. Digital payments can also address the costs associated with cash such as the risk of storage, transportation, impulsive spending and marginalization from the formal economy.¹⁶ As direct beneficiaries, women can utilize instant peer-to-peer transactions, save conveniently and cater to emergencies/shocks without bearing the costs associated with travel and time.

Use of DFS for rural women

The utilization of DFS can emerge as a catalyst for rural development, enabling rural women to plan better for the household and to appropriately meet the financial needs. In addition, they can receive government subsidies or loan disbursements and make payments to utilities, all via mobile money transfers with minimal effort and without inefficient handling of cash.

Empowerment of rural Indian women through digital financial solutions

Present state of affairs		DFS solutions	Gender impact/outcomes
<ul style="list-style-type: none"> Limited control over earnings Imprudent expenses 	MERCHANT REPAYMENTS	<ul style="list-style-type: none"> Income/earning Business transactions Consumption expenses 	<ul style="list-style-type: none"> Financial tracking in business and household expenses Financial control & decision-making Check on impulsive spending
<ul style="list-style-type: none"> Long-distance travel to bank costing time and money Limited access to low-cost credit 	CREDIT PAYMENTS	<ul style="list-style-type: none"> Loan disbursements Loan repayments 	<ul style="list-style-type: none"> Easier credit appraisal, monitoring and approval due to improved digital footprint Expansion of business/entrepreneurial activity
<ul style="list-style-type: none"> Risk of theft Cost of handling cash 	REMITTANCES	<ul style="list-style-type: none"> P2P transfers 	<ul style="list-style-type: none"> Time, effort and money are saved Transfers from the comfort of home & mobile phones
<ul style="list-style-type: none"> Exclusion from benefits Long-distance travel to receive cash 	GOVT. PAYMENTS	<ul style="list-style-type: none"> Subsidies, benefits Utilities (water, electricity, fuel) 	<ul style="list-style-type: none"> Inclusion in financial benefits from government

❖ **2.2 Value Chain Approach for Digitization**

The value chain perspective offers a critical entry point that allows for better design of digital financial services for different stakeholders with distinct financial needs.

In the absence of formal financial institutions, the larger stakeholders in the value chain often emerge as important providers of rural finance due to their funding capacity. Hence, the value chain approach enables the development of a deeper understanding of pain points and needs as well as challenges and opportunities required to design customized DFS solutions for different rural customer segments, including women. The value chain approach also enables a better sector-specific understanding of peculiarities of financial transactions among the value chain actors and identifies potential bottlenecks to develop customized DFS solutions.

DFS offers an opportunity to address the pain points that different actors along the value chain face by reducing transaction costs and information asymmetries.

To illustrate, aggregation of data and analysis related to production, sales, payments and seasonality of cash flows among value chain actors that offer the potential to extend credit to producers, traders and intermediaries, processors and retailers. Likewise, the rise of mobile-enabled finance provides an opportunity to make payments to producers directly without the need for intermediaries thereby increasing efficiencies. As such, it offers a business opportunity for DFS providers who wish to extend their offering to rural markets.

¹⁶Radcliffe and Voorhies (2012), Bill and Melinda Gates Foundation: A Digital Pathway to Financial Inclusion. http://responsiblefinanceforum.org/wp-content/uploads/Pathway_Financial_Inclusion.pdf

There are three use cases for DFS in rural value chains, making the case for a value chain approach:

1. Improving the efficiency of financial transactions between value chain actors and their transaction ecosystem
2. Overcoming barriers associated with the provision of financial services to value chain actors
3. Improving market opportunities for value chain actors

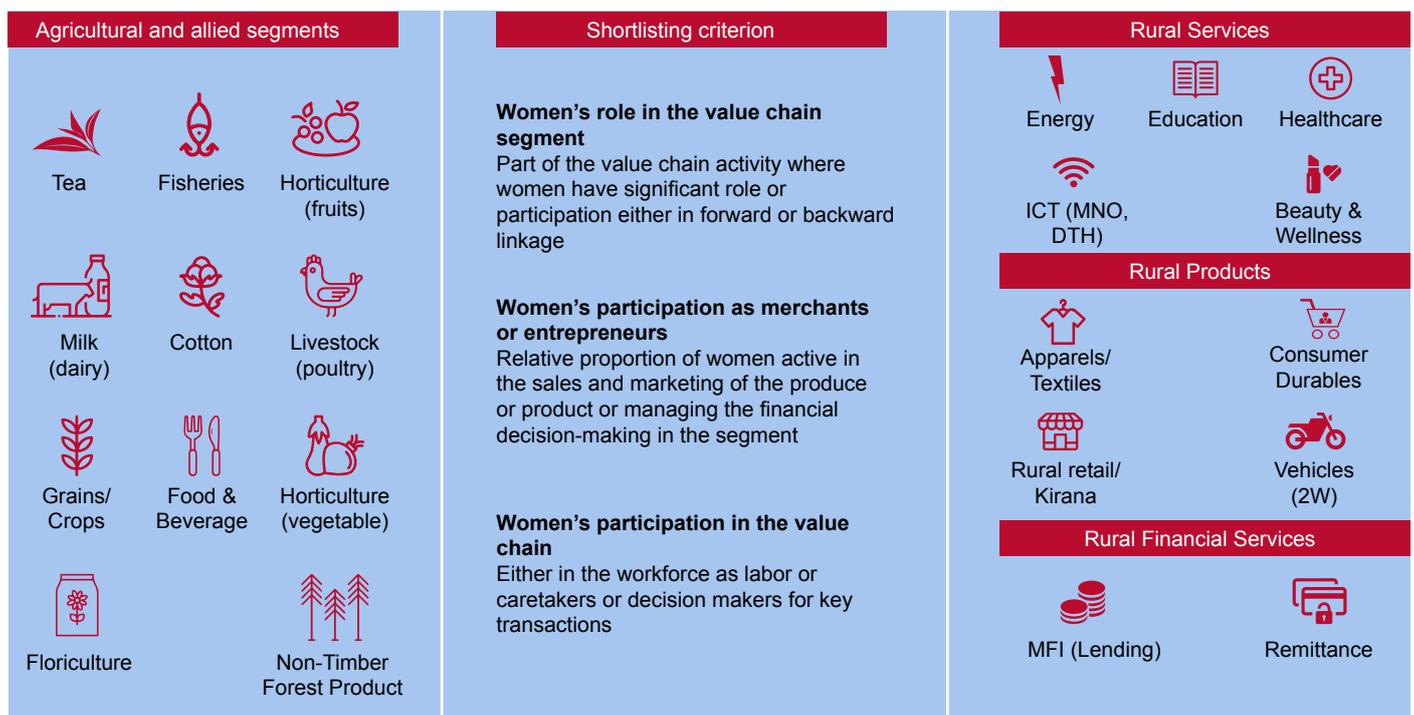
The value chain approach helps in developing clarity of the roles and activities of each interconnected stakeholder; maps the nature of financial transactions or economic activity between these key stakeholders and allows for a deeper understanding on the gender aspect and role of women along the key activity areas.

❖ 2.3 Assessment and Shortlisting of Value Chains for Digitization

The rural economy in India can be broadly classified into four segments: agricultural and allied activities, rural retail and marketing, rural services (general) and rural financial services. The value chains around these segments can be evaluated to obtain specific insights on the digitization opportunities and women empowerment. Three gender-specific parameters can be utilized to identify the top value chains in rural India where women have significant participation.

- **Women’s role in the value chain segment** the type of activity that they are engaged in: either in the workforce as labor, caretakers, or as decision makers for key financial transactions
- **Women’s participation as merchants or entrepreneurs:** relative proportion of women active in the sales and marketing of the produce
- **Level of women’s participation in the value chain** (high, medium or low, in relative terms)

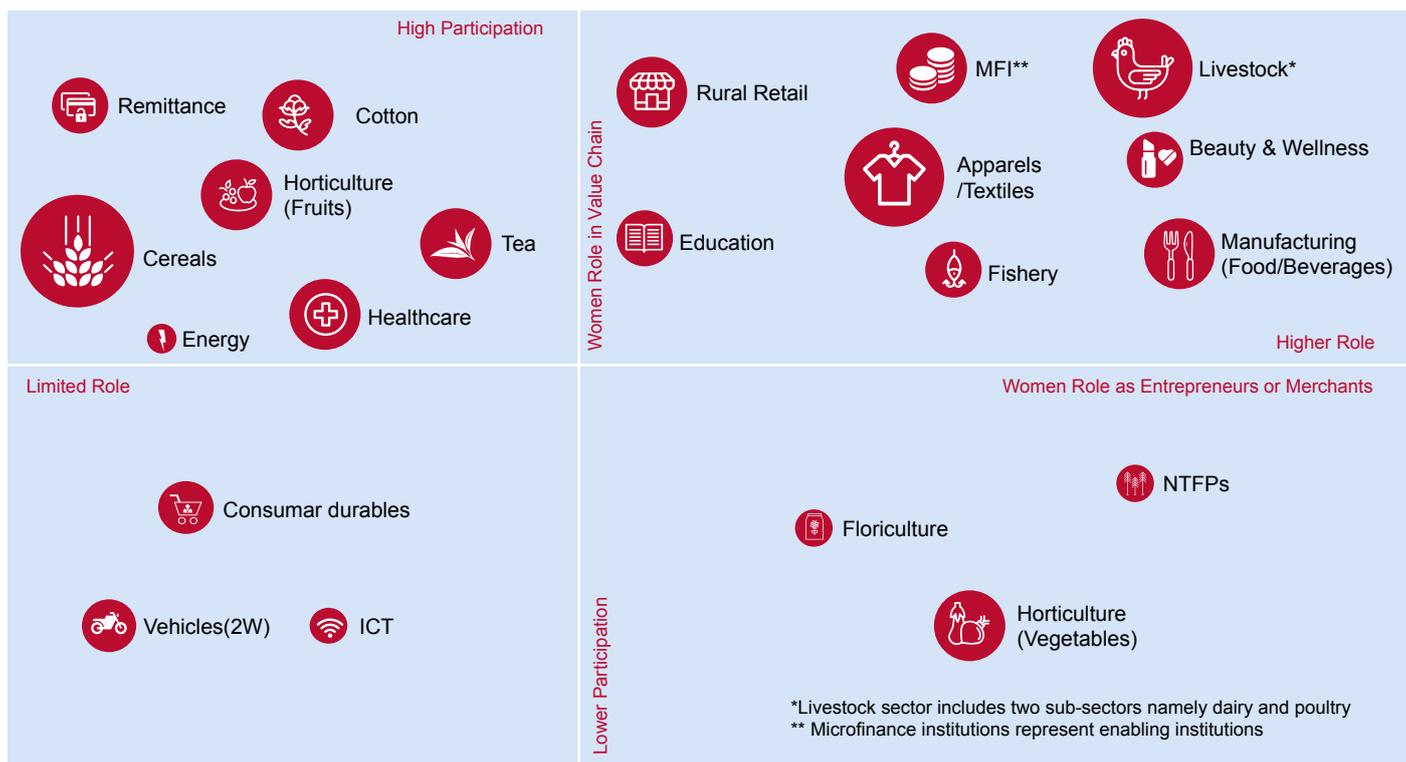
Summary of value chains with women participation



Dairy, poultry, fisheries, rural retail, apparels & textiles, food & beverage processing, beauty & wellness, education and microfinance emerge as promising value chains with respect to women’s active participation in production, sales and marketing of products, engagement in financial transactions and decision-making in business and rural household spending.



Selection framework for shortlisting the value chains with high women participation



Note: All 22 value chains fall into the matrix shown above that assesses women's roles across two dimensions - a) On the x-axis women's involvement as entrepreneurs or those involved in making financial decisions in business and home; b) Y-axis presents women's overall role in the value chain with low to high level of participation, irrespective of the activities they are engaged in. The top eight selected value chains fall in the first quadrant and were selected for further exploration and deep dive.

At the second level filtration stage, the value chains can be assessed on broader socio-economic factors such as presence of aggregators or private sector players, distinct financial transaction challenges in the value chain and rural wallet share to further shortlist the higher digitization potential value chains.

Shortlisting of the value chains based on women's role across the value chain

	DAIRY	POULTRY	FISHERY
Brief rationale for selection/non-selection	High scores on most parameters with clear DFS need. Good presence of organizations for partnership	Scores well on most parameters. Good presence of women aggregators/cooperatives for partnership	Scores well on most parameters. Presence of women aggregators/cooperatives for partnership
	RURAL RETAIL	APPARELS & TEXTILES	FOOD & BEVERAGES
Brief rationale for selection/non-selection	Scores high on most parameters with clear DFS need. Presence of corporates/cooperatives for partnerships	Scores well on most parameters but low presence of formal large scale women organizations for partnership	Scores well on most parameters. Presence of women aggregators/cooperatives for partnership
	BEAUTY & WELLNESS	MICROFINANCE	EDUCATION
Brief rationale for selection/non-selection	High scores on most parameters but highly unorganized sector in rural India. Negligible presence of formal organizations for partnership	Scores high on most parameters with clear DFS need. Presence of strong partners in the segment	Scores low on women participation as merchants. Moreover, less presence of corporates/cooperatives in rural areas for partnership

Finally, the value chains can be assessed on economic and replicable potential, transaction intensity and presence of local change agents to identify the top two to three value chains for a deep dive assessment and digitization pilots. These parameters are explained below:

- **Presence of aggregators:** These include organizations that work at scale toward women's empowerment, and hence act as an important network player to reach out to large number of women in a given geography. The examples include cooperatives in dairy and F&B manufacturing and private MFIs. These aggregators also act as an important and potential value chain partner to help integrate efforts toward digital inclusion, adoption and scale.
- **Replication potential across rural India:** This is assessed in terms of scale of operations across the majority of Indian states, especially in rural areas. For instance, dairy production is fairly spread across major states of India, whereas marine fishery as well as aquaculture production is concentrated in a few coastal states and northern states.
- **Propensity to digitize:** This refers to the inclination of key stakeholders in each value chain to adopt digital payments or prevailing DFS initiatives as observed and discussed during the field visits. This refers to the inclination of key stakeholders in each value chain to adopt digital payments or prevailing DFS initiatives as observed and discussed during field visits. For instance, in dairy, the gradual adoption of DFS, such as digital payments into farmers' bank accounts, has emerged as a practice in some larger cooperatives and private dairies.
- **Presence of local change agents:** These are the organizations or stakeholders that demonstrate the ability to influence local decision-making and hence, can facilitate the adoption and scale of DFS initiatives in rural areas. These include self-help groups (SHGs) of women, progressive farmers and local retail stores and input providers that can be positioned as the change makers for DFS adoption in rural communities, due to their knowledge and interests associated with new technologies.
- **Transaction intensity:** This refers to frequency and value of payments made in a particular value chain, across backward and forward supply chains. The higher the frequency and value of payments in a value chain, the more incentive it creates for the value chain actors to adopt and engage in digital transactions.



Upon detailed analysis, two value chains, namely, dairy and food and beverage processing have been selected as priority value chains for high impact DFS interventions, whereas, rural retail and microfinance institution have been identified as ‘enablers’ for creating a DFS enabled ecosystem.

‘Enablers’ implies that microfinance and rural retail institutions form an integral part of the economic activity in rural areas, irrespective of the value chains operating in an area. These meet the critical needs on, access to credit for livelihoods generation, and on daily or regular spending and can serve as enablers to revolutionize the way households transact in rural India.

Selection framework for value chain deep dive

Value chain analysis

Dairy and F&B manufacturing value chains selected for deep dive and pilot selection. MFIs and rural retail are enablers in the rural ecosystem

SHORTLISTING CRITERIA	 DAIRY ✓	 POULTRY	 FISHERY	 RURAL RETAIL ✓	 FOOD & BEVERAGE ✓	 MFI ✓	
Women’s role in financial transactions	● Participation of both men & women	● Participation of both men & women	● High participation of women in sales	● High participation of women in sales	● Participation of both men & women	● Disbursements/ repayments by women	
Presence of aggregators/ influencing organizations/ partners	● High presence of women cooperatives, corporations	● Good presence of women cooperatives	● Presence of cooperatives, aggregators	● Largely informal/ unregistered units	● Presence of cooperatives, aggregators	● Good presence of private players	
Replication potential across rural India	● Presence across all major states	● Presence across all major states	● Dominance in coastal states	● Presence across all major states	● Dominance in high income states	● Presence across all major states	
Propensity to digitize (inclination/ interest in financial services’ players and presence of initiatives)	● Adoption of DFS seen in the value chain	● Limited DFS initiatives	● Limited DFS initiatives	● Limited DFS initiatives	● Limited DFS initiatives	● Cashless operations	
Presence of local change agents for uptake of DFS	● Head of milk society/collection points	● Cooperative heads	● SHG group leaders	● Store owners, household children	● SHG group leaders	● Business correspondents/ field officers	
Transaction intensity in forward linkage (freq. of payments & value)	● Payments every 7-10 days	● Payments every 30-45 days	● Daily/weekly payments	● Daily payments	● Weekly/monthly payments	● Weekly/monthly payments	
Source: Intelicap analysis based on primary interactions						● High Rating	● Medium Rating
						✓ Shortlisted value chain for deep dive and pilots	✓ Ecosystem enabler

** The Intelicap team adapted a mix of secondary research, primary field visits and interviews to build upon the findings, and evaluate opportunities to integrate Digital Financial Services (DFS) into the value chains. In total seven rural locations across India were selected to study and analyze the two main value chains, and the ecosystem supporting value chains. The geographies were selected based on metrics such as production volume, presence of rural women establishments and women’s participation in the workforce across low-income and high-income states of India.



DEEP DIVE ASSESSMENT OF VALUE CHAINS

❖ 3.1 Dairy Value Chain

Value chain description

The dairy sector contributes nearly 18 percent to agricultural GDP in India and provides livelihood opportunities to more than 75 million women, making it a key sector for catalytic interventions targeted at women’s economic empowerment in rural India.

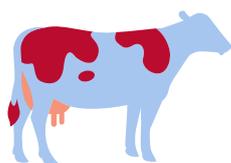
India is the world’s largest milk producer (18.5 percent of the world’s milk production) and an employer of nearly 70 million rural households, indicating its strong role in rural income generation.¹⁷ The majority of India’s dairy farms are small, with an average herd size of two to three cattle, so the significance of the sector in alleviating rural poverty through livelihood generation is immense. Likewise, gender statistics indicate the involvement of nearly 75 million women in the country’s dairy sector as opposed to 15 million men, demonstrating the higher role of women in the value chain and significant scope of social and development interventions for women.¹⁸ Women dairy farmers also make financial decisions on the sale of milk and decide upon the household expenditure on food and ration, utility bills, or their children’s education. The dairy sector, therefore, has the wherewithal for financial empowerment and inclusion of women farmers in rural India.

The dairy sector is characterized by two distinct

business models: cooperative-led model and private sector-led model, the operational similarities of which make them attractive for DFS providers.

The difference between the two business models, however, lies in a more democratic structure of cooperatives with farmers’ representation at all levels, from pourers to collection center managers to board members, ensuring timely grievance redressal for the smallest of farms. The cooperative model aims at eliminating middlemen from the value chain and providing fair prices for milk sold by farmers. It has also been recognized for inclusive development, delivering higher returns and improving livelihoods of their member farmers. It has to be noted that the dairy market in India still is largely unorganized with local milkmen or “gwalas” procuring and marketing nearly 36 percent of milk produced (with farmers retaining 48 percent of milk for household consumption).¹⁹ Nonetheless, the organized sector comprising of cooperatives and large private dairies makes a better choice from the point of financial and social inclusion of the end dairy farmers, and also for future digitization interventions due to the operational efficiency and commercial viability of these business models.

Snapshot of the dairy sector in India

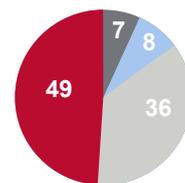


4.2% milk sector contribution to the GDP of India

Market Size (Polypack Milk): USD 6 billion in 2015
Sector Growth: 15-18% CAGR (2008-2015)



Number of women establishments
~2.1 million



- ❖ Household consumption
- ❖ Local/unorganized middlemen
- ❖ Cooperatives
- ❖ Organized private dairies

¹⁷Smallholder dairy value chain development in India, 2014 ILRI Project Report https://cgspace.cgiar.org/bitstream/handle/10568/35469/PR_pr_sturation_analysis_India_print.pdf?sequence=10

¹⁸Press Notice by Ministry of Agriculture & Farmers Welfare 2015-16. <http://pib.nic.in/newsite/PrintRelease.aspx?relid=145394>

¹⁹India’s Dairy Sector: Structure, Performance and Prospects, USDA 2011

Value chain actors and role of women in the dairy sector in India

The dairy sector has the highest women's participation among rural value chains in India.²⁰ Dairy farmers or pourers are central to the value chain and services provided by value chain actors revolve around meeting farmers' livelihood needs. These include cattle sale and purchase, productivity enhancement and healthcare of cattle, cattle insurance for security against shocks, improvement of milk quality, market linkages, better prices for milk sold, extension services and credit needs. Other actors in the

value chain include cattle traders, input suppliers in the backward supply chain, veterinary and extension service providers in both backward and forward supply chains and collection agents at local milk collection centers, local milkmen, organized dairy cooperatives or corporations in the forward supply chain. The cattle traders and local milkmen belonging to the unorganized segment of the dairy sector, are not considered for further assessment in this report.



Three profiles of women dairy farmers were observed during the ethnographic survey with varying roles across the value chain and levels of financial decision-making. This indicated the need for customized targeting of stakeholders in the dairy value chain and value proposition strategy for DFS providers.

The profiles of women are as described below:

- The **first set of women (constituting around 20-25 percent of the total participants)**, referred to as **'enterprisers'**, were more resourceful toward entrepreneurship, by proactively engaging in the value chain, not only as work force participants but also as financial managers. Women in this segment were observed to be active in sale of milk, transaction recording, care of the cattle and financial decision-making at the household level.
- The **second set of women (constituting around 60-70 percent of the total participants)**, referred to as **'strivers'**, were active in the cattle management activities including cleaning, feeding, milking, fodder collection. The sale of milk and earnings were largely managed by men in the household.
- The **third set of women (constituting around 10-15 percent of the total participants)**, were **'subsistence farmers'**, and played a limited role either in sales or as workforce participants; the milk obtained from cattle was primarily used for household consumption in this segment.

All these three sets of women have distinct behavioral aspects and financial needs with varied nature of financial support. For the purpose of digitization, the emphasis is drawn toward the first set of women dairy farmers, who show greater potential and willingness to undertake digital interventions.

²⁰Source: Economic Census 2016



ENTERPRISERS

Manage activities from animal management to sale of milk

STRIVERS

Support functions at home but limited awareness about business

SUBSISTANCE FARMERS

Manage cattle to meet the household demand for milk

Socio-economic profile

- Low income and economically backward caste groups; traditionally are involved in raising cattle and selling milk
- Members of village level SHGs/joint liability groups (JLGs)
- Owners of 3-6 milch cattle; conscious investment in upkeep, healthcare and productivity
- Estimated average earnings: INR 10,000-15,0000 per month
- Members of organized dairy segment (cooperatives/ private)

- Low-income women dairy farmers in a village with limited resources
- Occasional pourers in MCCs or to local milkmen
- Own about 2-3 milch cattle; limited investment for productivity enhancement or healthcare
- Estimated average earnings: INR 6,000-8,000 per month; sales largely managed by men
- Males of the family may be members of the organized dairy segment (cooperatives/ private dairies)

- Impoverished and at times socially excluded marginalized women dairy farmers in a village
- Subsistence level milk production to meet household demand
- Own 1-2 milch cattle; low milk yielding breeds; limited access to credit for cattle purchase or productivity enhancement
- Estimated average earnings: INR 3,000-5,000 per month
- Generally, no memberships in institutionalized dairy businesses

Education

- Mix of uneducated women and those with primary and secondary education

- Largely uneducated, maximum education is seen up to 8th standard

- Largely uneducated, maximum education is seen up to 8th standard

Behavioral aspects

- Confident in interactions
- Understand financial management
- Aware about a few DFS

- Limited understanding of finances
- Less aware of digital channels
- Dependent on men for information

- Not confident in interacting with outsiders
- Not aware of digital channels
- Dependent on men for information

Financial decision-making facility

- Manage dairy business finances - milk sales, feed/input purchases
- Manage household expenses

- Limited role in sale of milk
- Support men in financial decisions
- Manage household expenses

- Not involved in milk sales
- Involved in farm labor for income generation for household

Typical financial needs

- Cattle finance to business expansion
- Cattle insurance

- Cattle finance
- Medicine and high-quality feed

- Additional income sources
- Training on dairy farming
- Access to credit

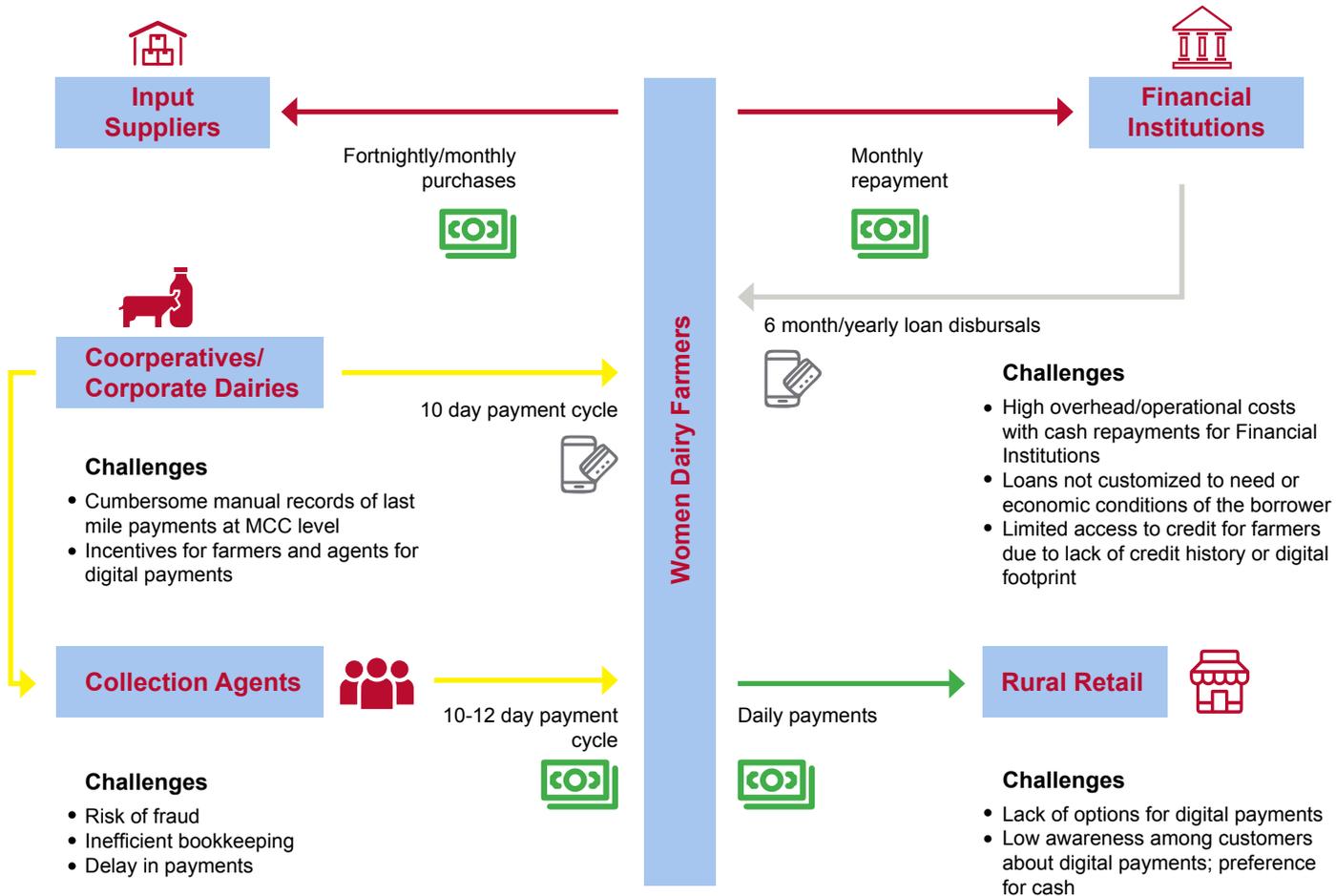
Transaction mapping in the dairy value chain

The financial transactions between different stakeholders in the dairy value chain have been mapped. These are assessed on type, frequency and value of transactions, as observed during field interactions. The map also highlights specific challenges in a given segment. The assessment of financial transactions helps in understanding the status-quo at the level of each player, and how these can be addressed during the pilot interventions for digitization.

Financial transactions among key stakeholders in the dairy value chain

Value Chain Players

Ecosystem Players

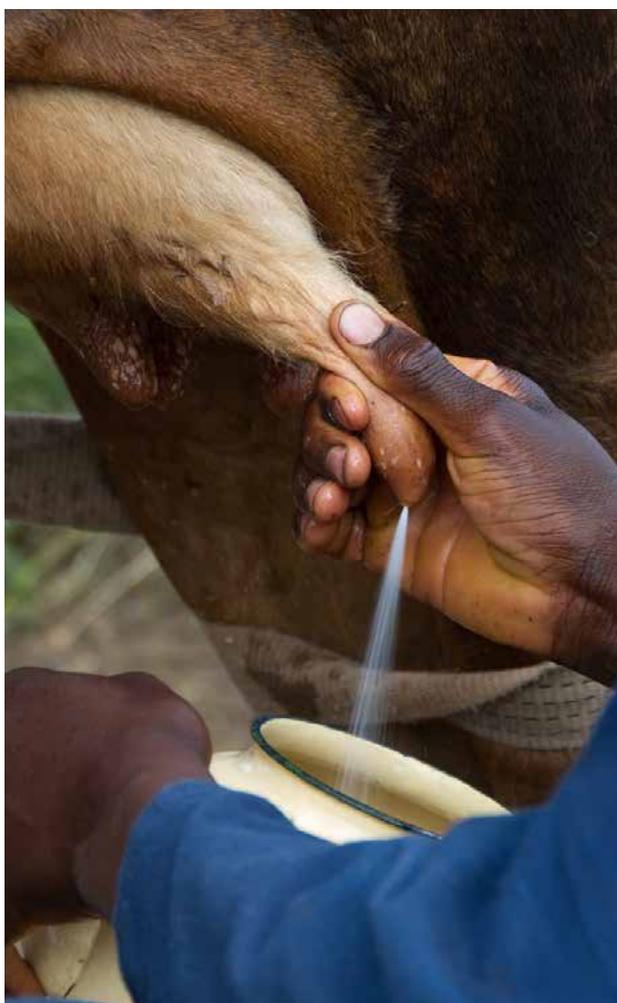
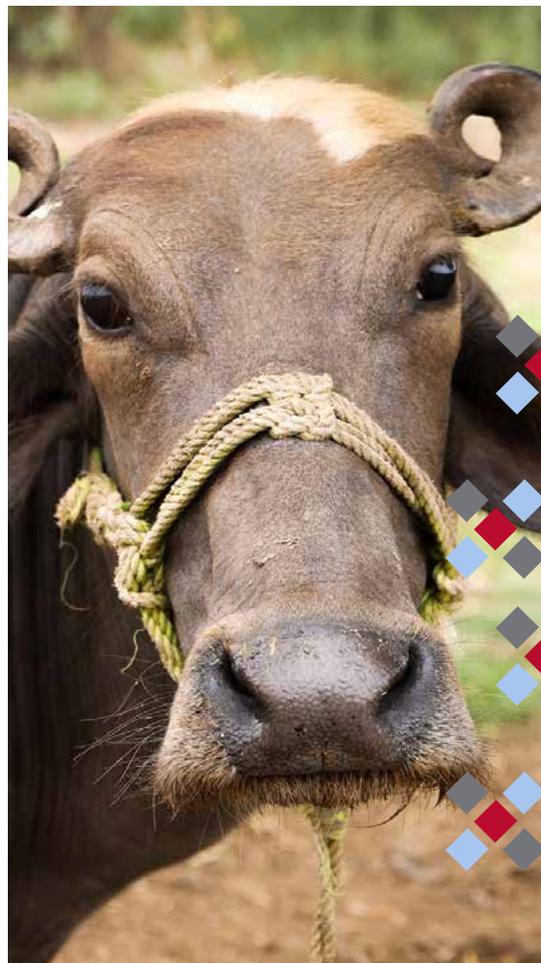


Source: Field observations and interactions with dairy farmers in the selected locations



Cooperatives ↔ Women dairy farmers

- **Transaction flows and type:** Women dairy farmers receive payments directly in their bank accounts for the milk supplied, the payments for which are calculated based on solid non fat (SNF) and fat content in the milk as poured in the MCC. Such digital payments were observed in case of a few larger dairies such as Amul in Gujarat and similar large cooperatives that aim to avoid any discrepancies in payments or due amounts. These large milk cooperatives also promoted financial inclusion of their pourers by promoting the opening of members' bank accounts with their banking partners.
- **Frequency and value:** The payments are usually made in a 10-day cycle as observed in the dairy segment in India. This allows dairy farmers to have sufficient value and volume of money to take home. The income of women dairy farmers varies based on the number of cattle owned and the cattle breed, with monthly incomes ranging from INR 4,000 – 8,000 per lactating cow.
- **Key challenges observed:** The bank payments received by women dairy farmers are often cashed out to meet any business or household expense. Women, in general, have to travel long distances to the nearest bank branch need to fill up several withdrawal sheets, stand in long queues and return home by the end of the day incurring loss of day's wage earnings, travel fare spends and chances of theft in case of remote rural locations.
- **Digitization opportunity:** Provision of safe and secure DFS channels such as micro ATM within the village vicinity is likely to mitigate the challenge of cash theft and insecurity with women dairy farmers. The collection agents or the local rural retail store owners could be investigated as potential cash-out points for the Micro ATMs.



Intermediaries such as collection agents/secretaries ↔ Women dairy farmers

- **Transaction flows and type:** For smaller cooperatives and private dairies, the payments to dairy farmers are usually routed through intermediaries such as collection agents at the village-level milk collection centers. These intermediaries have specific contracting agreements with dairy companies and receive electronic payments on behalf of dairy farmers. In most of the cases, these intermediaries act as cash-out points for the farmers within the village saving the women dairy farmers the need to travel long distances to withdraw money.
- **Frequency and value:** These intermediaries usually receive payments from the milk cooperatives/corporate dairies every 10 days. However, there is a delay of one or two days in payments to the farmers as the intermediary needs to travel to a bank or an ATM machine to withdraw cash. The income for intermediaries is based on the commission derived from the value of milk on a daily basis. The value of milk collected depends on the size and capacity of the collection center and is usually between INR 500,000-2 million annually as observed in the selected field locations.
- **Key challenges observed:** There is a delay in payments made to farmers, and the risk of a higher commission charged by collection agents, due to incorrectly reporting the milk volume or SNF and fat contents in the milk.
- **Digitization opportunity:** Provision of direct payments to dairy farmers bank accounts through electronic money transfers. With high presence of Jan Dhan accounts²¹ and payment bank accounts (through linking with the mobile phone number), DFS could mitigate the opportunity cost incurred due to delay in cash payments.

²¹ No frill savings bank accounts introduced by the Indian Government to facilitate financial inclusion in India

Women dairy farmers ↔ **Input suppliers and extension service providers**

- **Transaction flows and type:** The purchase of inputs such as feed, and extension services such as medicines, vaccines and, supplements from local or institutional suppliers, was more common among women dairy farmers who were members of large cooperatives. The payments were either made immediately at the point of sales in cash (primary payment method), or in some cases, on credit. Here, the amount is settled between the women dairy farmer and the input provider through earnings from the sale of milk.
- **Frequency and value:** The input purchases may roughly range from 15-30 days depending upon the number of milch cattle that a woman dairy farmer owns. The value of cattle-feed was dependent on the farmer's purchasing capacity and, number and breed of animals to be fed. The values ranged from 20% to 25% of the income generated from milk.²²
- **Key challenges observed:** The purchase decision by women dairy farmers was need-based and failed to take into account any future emergencies such as cattle mortality and drop in milk productivity. Moreover, the presence of informal credit and high use of cash without an adequate recording of transactions could lead to loss of value in financial transactions, both for the women dairy farmers and for the inputs providers.
- **Digitization opportunity:** Offering bundled financial products, such as cattle insurance, along with microfinance loan to reduce the payment default risk for the dairy farmer. DFS channels can be utilized to save time to offer customized cattle insurance and credit products based on historical digital transactions of the dairy farmer.



Women dairy farmers ↔ **Financial institutions (MFIs, banks); local moneylenders**

- **Transaction flows and type:** Farmers take long-term credit (usually exceeding one year) from MFIs or banks, for the purchase of cattle to run and scale-up their dairy business. Short-term credit (usually less than a month) is taken for recurring need for fodder, veterinary services and vaccination expenses that could either be served through SHG loans or through informal channels (such as credit from moneylenders or collection agents at MCCs). The loans from informal sources were primarily in cash with exorbitant interest rates that were as high as 10-20 percent a month. Formal institutions like banks and MFIs were seen catering to this demand through a mix of digital and cash disbursements.
- **Key challenges observed:** High overhead and operational costs associated with cash disbursements for banks and MFIs; lower financial literacy among women dairy farmers also meant that there was very low awareness on the impact of higher interest rates from informal sources on their debt situation.
- **Digitization opportunity:** DFS channels could be utilized to speed up the process of credit appraisal, monitoring and approval resulting from the improved digital footprint of the dairy farmers.

To summarize, there are significantly high frequency transactions among all the stakeholders in the dairy value chain, where DFS channels could be utilized for the optimization of the operational processes. The high frequency transactions with 10-day payment cycle are observed between cooperatives and dairy farmers or between cooperatives and collection agents. The medium frequency, on the other hand, ranging from monthly to bi-monthly payments, can be observed between input suppliers and dairy farmers. The assessment of value chain transactions among all stakeholders reveals existing preferences, perceptions and systems in place with respect to monetary dealings. Understanding the intra-value chain financial transactions in the dairy value chain would help develop a customized digital financial product for a smooth transition from cash to digital modes of transactions.

²²As informed by the dairy farmers during the field interactions

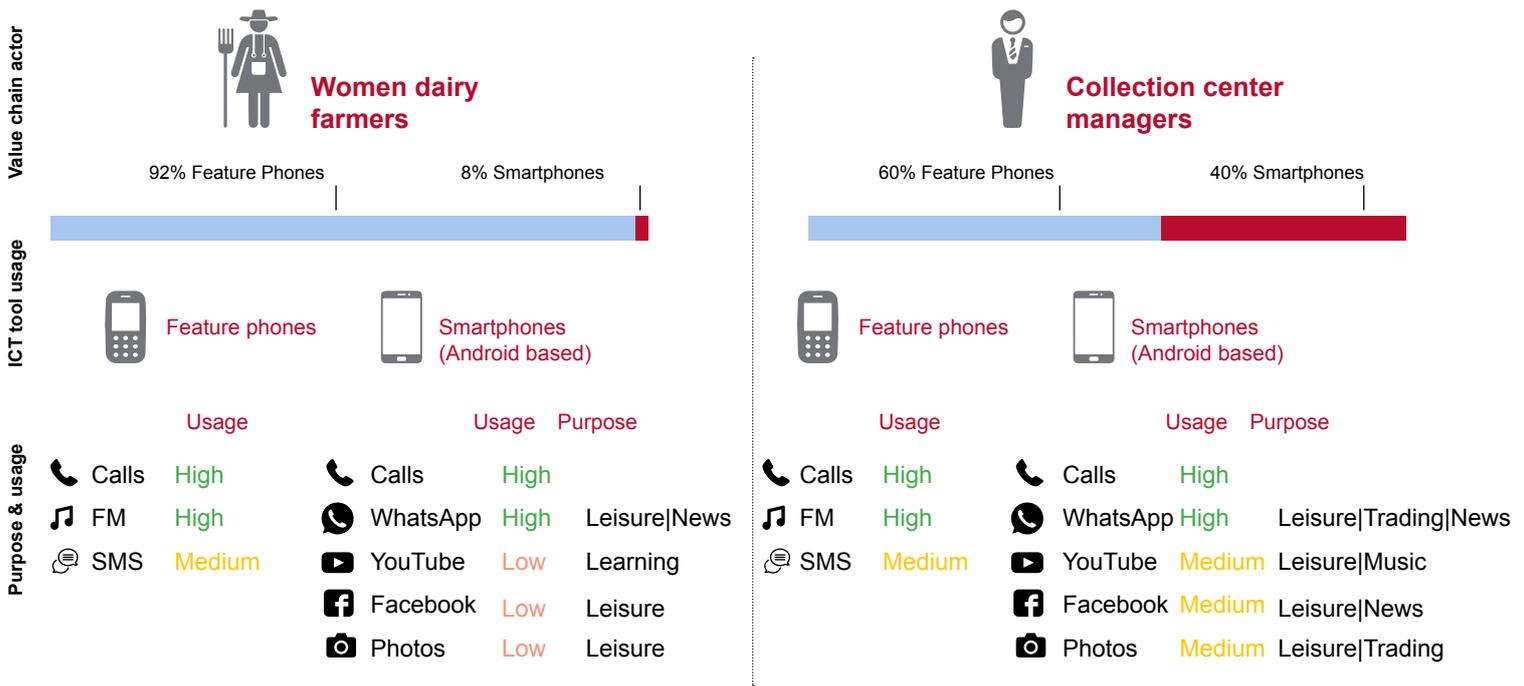
Mobile phone usage by value chain actors

The ownership and usage of mobile phones among key stakeholder groups in the dairy value chain are discussed below. These points highlight the gender-based differences in the type of mobile phones owned by farmers and collection agents, thereby implying a need to develop multiple solutions for a digital onboarding of women dairy farmers. The infographic below shows different use cases among dairy farmers and collection agents.

Key insights

- A majority of women dairy farmers use basic feature phones indicating the need of message based banking or USSD services.
- Collection center managers have higher ownership of smart phones and use digital media tools such as WhatsApp and YouTube indicating their potential role as change agents for DFS adaption.

Mobile phone usage by key dairy stakeholders



Source: Field observations and interactions with dairy farmers in the selected locations



Women dairy farmers

93% +
Women dairy farmers either owned or had access to a mobile phone

8%
had access to a smartphone

55% +
Women dairy farmers found it difficult to read simple messages on their mobile phones



Making Calls

Social Media

Common usage of mobile phones



- Basic or feature mobile phones were seen widely spread among women dairy farmers. However, there is a significant gender bias in terms of ownership, with male dairy farmers more likely to own a mobile phone compared to women dairy farmers.
- During interactions with dairy farmers covered in the field visits, more than 95 percent of them owned or had access to basic or feature mobile phones, with men more likely to own a smartphone compared to that of women. This gender-based gap in the ownership of mobile phones could possibly be explained by decision-making for such purchases resting with men, leading to limited exposure and subsequently little demand for smartphones among women.
- The use of mobile phones amongst women dairy farmers depended on the type of phone and level of literacy. Many of the mobile phones were used to listen to music or agriculture related programs on the local radio channels. Women dairy farmers with access to smartphones were familiar with YouTube and WhatsApp, though use of these channels was limited.
- The major deterrent that limited the use of mobile phones among women, was their low literacy levels. This made it difficult for them to read simple messages. The women were often dependent on the educated members of the family or the local kirana store owners to decipher the meaning of a message. Interestingly, while a few men dairy farmers were aware of DFS solutions, they were reluctant to impart such knowledge to women as they feared over-spending or incorrect transactions by women.

Intermediaries - Collection agents/secretaries

40% of collection agents owned a smartphone

60% were aware of digital payment channels

Making Calls

Social Media

Common usage of mobile phones

- A majority of the key intermediaries were economically stronger in the local village community and owned at least a basic feature mobile phone.
- The level of digital and financial literacy was also higher among these stakeholders as they were able to read and articulate the messages about payments as received on their phones.
- A few collection agents owned smartphones and used it to listen to music and to message using apps such as WhatsApp and Facebook. Many of these collection agents also used smartphones to share pictures and important information and statistics with dairy companies as required.
- Although UPI and BHIM applications were known to the technologically advanced collection agents, the knowledge on digital payments and methods was limited.

To summarize, the usage of mobile phones by women dairy farmers and collection agents points toward non-transactional purposes, dominated by basic use cases such as making and receiving calls or messages, listening to radio, taking pictures and accessing social media.



Financial behavior of the value chain actors

Women dairy farmers:

- **Access to credit:** The most common and easily accessible sources of credit for women farmers were local SHGs, local moneylenders, and dairy cooperatives (where they are members). In some cases, formal financial institutions such as MFIs and SFB's were seen inaccessible for women dairy farmers. There was limited awareness about the prevailing interest rates and its implications for long-term household finances. The access to institutional credit, especially from commercial banks, was limited, due to lack of collaterals, credit history and low awareness about formal procedures and requirements.
- **Savings:** Women dairy farmers were often members of a SHG and saved on a weekly, fortnightly or monthly basis, with deposits as small as INR 20 every week to INR 100 every month. These group savings also served the short-term capital need for recurring household expenses such as education, health and festivities. In this sense, these saving groups also served as safety nets for their members. There was, however, a lower tendency among women to save in banks individually barring surplus group savings which are deposited in respective group accounts.
- **Insurance:** The need for cattle insurance is increasingly being understood by organized players in the dairy value chain, especially cooperatives, who provide such services to the women dairy members directly or indirectly via tie-ups with insurance companies. However, in general, there is lack of awareness among smallholder dairy farmers about cattle insurance with limited access to such services in remote villages.

Typical sources of credit available to women dairy farmers

S. No.	Type of financial service provider	Typical services/Products offered and respective tenures	Pros and cons
1.	SFBs/MFIs/Non-banking financial companies (NBFCs)	Micro-credit products for cattle purchase or income generation largely through JLG model Typical duration: 1 year Slightly higher interest rates from 20-26% (declining balance) observed	<ul style="list-style-type: none"> • Easier to access loans with quick disbursements within 3-4 days
2.	Local cooperative banks/ Commercial banks	Individual loan products for cattle/machinery purchase Typical duration: 2-3 years Low interest rates of 10-15% (annual) with affordable long-term paying option	<ul style="list-style-type: none"> • Cumbersome process of documentation, paperwork, loan approval
3.	SHGs/NGOs	Micro-credit products for smaller household needs Typical duration: a few months to 1 year Interest rates are lower at around 10% (annual) and dependent on loan size	<ul style="list-style-type: none"> • Easier to access loans with quick disbursements • Limited volume and lower ticket size
4.	Collection agents/ Other informal sources	On-demand credit for smaller household financial needs Typical duration: weekly or monthly No cap on interest rates with eventual high payments for farmers	<ul style="list-style-type: none"> • Easier to access on-demand loans for very short duration

Source: Field observations and interactions with dairy farmers in the selected locations

Intermediaries - Collection agents/secretaries

- **Access to credit:** It was observed that in the case of corporate dairies, the collection center agents were generally progressive or were amongst the high-income farmers, village level entrepreneurs (VLEs), or even educated youth, who run and manage these centers. These collection agents often provided access to short-term credit to small farmers largely through an informal system (with no credible underwriting) and deducted the respective repayment amounts from milk payments due to the farmers. These agents also required access to credit to expand their individual businesses and had improved access to formal financial channels such as corporative banks and regional rural banks.
- **Insurance:** In some cases, the collection centre agents also worked as insurance agents and promoted the cattle insurance policies among the dairy farmers.

Feasibility of introducing DFS in dairy value chains

The low literacy level among women dairy farmers is a strong deterrent to adopt DFS channels. Use of DFS channels needs basic understanding or self-explanatory nature of texts and messages.

A distinct pattern of education levels among women dairy farmers was observed in high and low income states. While nearly 50 to 60 percent of dairy women farmers' in high income states had completed basic education and were able to read and write, the corresponding figure in low income states was between 20 to 25 percent. For digitally-enabled payments, it is important to devise mechanisms and products that cater to such groups of women and build their capacities in this regard. The role of change agents such as school-going children or an educated rural retail store owner becomes critical to target digital on-boarding of women dairy farmers.

Limited awareness and prevailing knowledge gaps about digital payments among women, lead to low confidence on DFS. This represents a potential barrier to implementation.

In cases where digitally-enabled transactions are possible, women exhibited limited use of DFS enabled payments but were more enthusiastic in adopting such channels in case proper training is given to them. The implicit fear of losing money in such transactions is to be combated through targeted and customized awareness sessions to ensure adoption and scale-up of cashless payments.

A woman entrepreneur in Rajasthan belonging to a women's dairy farmer producer company (FPC), who pours milk daily at a village level milk collection center (MCC), hints towards **low awareness and confidence among rural women about banking procedures in the quote below:**

"Women take more time in banks since they are less confident and not aware about the processes such as filling of cash withdrawal or deposit forms and generally have to request someone at the bank to fill it for them. All this consumes more time and they end up spending five to six hours in this activity or send the men from the family to do the needful."

- A dairy entrepreneur in Rajasthan on pain points associated with cash transactions.



Digitization of payments to farmers for daily milk deposits at collection centers can help in timely payments and reduce the opportunity costs associated with delayed payments.

It has been observed, that payments to farmers get delayed by one or two days, in a 10-day cycle, especially where the collection agents are dealing in cash-based transactions. The reasons include the distance of ATMs and bank branches for cash-withdrawals or provision of inputs like feed, fodder on credit by the agents later to be adjusted in milk payments. Direct payment into farmers' bank accounts directly will ensure timely remuneration, especially in case of small farmers with dairy as their main livelihood option.

The corporate or cooperative dairies face challenges in tracking correct and timely payments to their dairy farmers. This may be in cases where last-mile payments are still made in cash by collection agents, giving rise to grievances on the members' end.

"We wish to improve efficiency across the value chain and ensure that our pourers get timely payments. Digitization, we believe, can resolve these challenges, although we need to revisit our existing business model and see how we can incentivize all players to engage in digital transactions. For us, it makes all the sense as we can check inadequacies in cash-based payments and see whether benefits reach our farmers."

- An official from a private dairy in Bihar on willingness and reasons to digitize last-mile payments to their dairy pourers.

Digitization of payments in the dairy segment provides an opportunity for institutional credit providers to offer specialized or customized financial products based on better credit underwriting on transaction intensity and ability to repay.

Based on field interactions with women dairy farmers, the existing credit providers (including MFIs and cooperative banks) offer loan products that are not reflective of purchase requirements. For example, the amount approved for purchase of high yielding cattle such as buffalo or jersey cows are inadequate. Fixed repayment periods do not account for dairy income patterns and there is a lack of add-on or top-up loan products to fill need-gaps such as for education, health and emergencies. By digitizing payments, lenders can better assess and underwrite dairy farmers' credit needs based on alternative data and digital footprints and thereby offer more customized access to individual credit for these women dairy farmers.

A practical challenge is presented by collection agents exclusively deal in cash to avoid traceability of their financial history or transactions, for the fear of missing out on government benefits

For many collection agents (who may own a few milch cattle themselves), any digital payment was seen as leading to a traceable history of transactions. This group had a strong feeling that such traceability would allow government agencies to determine the income and profit levels thereby limiting the perks and benefits (tax benefits and subsidies) that these stakeholders enjoy in the rural context. Improving awareness of data, identity, security and confidentiality of financial transactions should therefore be a part of any DFS literacy program that is designed for a particular value chain.



The opportunity for milk collection center agents and village-level milk societies lies in efficient bookkeeping of sales and receipts involving farmers.

Currently, receipt and sale of milk at village-level societies is maintained manually (except for larger cooperatives), which makes record-keeping cumbersome and increases the risk of errors or even exploitation and fraud by secretaries at collection centers. Digital book-keeping (for example, e-receipts to farmers, Message -based notifications for milk payments) can help increase transparency and reduce vulnerabilities. To recapitulate, the opportunities to digitize transactions in the dairy value chain can be understood from the stakeholder perspective with dairy farmers who stand to benefit from timely payments and reduced opportunity costs associated with delayed payments. On the other hand, the collection agents would gain from efficient book-keeping and clean transactions at the level of milk collection centres. On a macro level, this would assist dairy cooperatives and private players to be cognizant of business transactions and keep a check on any fraudulent activities.

The collection agents (usually large or progressive farmers, educated youth) at village level milk collection centers are also involved in selling inputs such as medicine, feed, fodder, and in some cases, also serve as cattle insurance agents. This implies an opportunity to develop these agents as Banking Correspondents (BCs) for micro ATMs or for utilities payments that can help uptake and scaling of digitally enabled transactions among dairy farmers.

“If there are more avenues through which we can increase our incomes by providing additional services to dairy farmers, we are ready to take those up. We already provide medicines and fodder and earn marginal profits on sales of these items.”

-A collection agent in Bihar on ways to expand their business and earnings.



❖ 3.2 Food & Beverages Manufacturing Value Chain



Value chain description

Food and beverages manufacturing (F&B) contributes to nearly 14 percent of India's GDP and provides direct or indirect employment to over 48 million people in India²³ with high female participation as both entrepreneurs and in the workforce.

Nearly 75 percent of the food processing industry is dominated by small, unorganized players. A large amount of the food industry is located in rural or semi-urban areas with significant participation from women. The direct linkage of food processing with agriculture, positions F&B as one of the most suitable value chains that functions in the rural economies and has great potential to provide alternative employment opportunities to rural youth.

Women have traditionally been responsible for pickling, grinding and husking produce for household consumption which has led to women entrepreneurs to be an ideal fit for running small food and beverage manufacturing units.

While women control the core processing operation, other activities, pertaining to procurement of raw materials and the sale of processed product to retailers and wholesalers are distributed between men and women, leaning more toward being dominated by men. The data on women entrepreneurship from the micro, small and medium enterprises (MSME) census indicates that the F&B manufacturing segment is the second highest sector of

operations for rural women after textiles and apparels segment with nearly 12 percent of the formally registered MSMEs falling in the F&B segment.

The majority of F&B enterprises in rural India are own-account manufacturing establishments (OAME) that serve a diverse set of customer segments indicating the need for bespoke financial and DFS solutions.

The OAME model usually constitutes of home-based primary processing units where the enterprise is run with minimal hired help. The primary customers of these OAME enterprises are usually village households in close vicinity followed by retailers of processed products in the local markets or district centers. Home-based units can be further categorized into entrepreneur-led units running without any external support and ones that receive training from external entities such as NGOs and state/district nodal agencies including state livelihood missions. Another business model, directory establishments or non-directory establishments (DME or NDME) involves hired workers to manufacture products under a brand name. Such enterprises usually have contractual agreements with larger companies and have limited presence in rural India. The nature of financial transactions for the OAME model with a different set of customer segments indicates the need to develop a suite of DFS solutions for the enterprises.

Snapshot of the food and beverages manufacturing sector in India



14% contribution of food processing sector to GDP

Contribution to national income: USD 258 billion (2015)

Sector growth ~12% p.a. (2015)

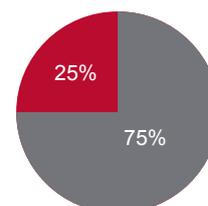


~2.5 million no. of food processing units in India

More than 90% unregistered units in the segment



No. of women establishments ~0.2 million units in rural India



■ Directory establishments or non-directory establishments

■ Own-account manufacturing establishments

Source: India Brand Equity Foundation
Source: MSME survey, 2010

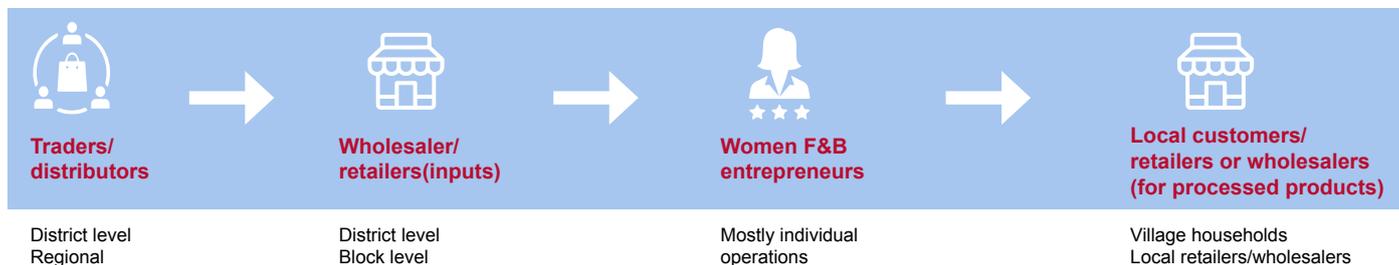
²³Food and Beverage sector: the new wave, Grant Thornton, http://www.grantthornton.in/globalassets/1.-member-firms/india/assets/pdfs/grant_thornton-cii-food_and_beverage_sector-the_new_wave.pdf

²⁴Rais M, Acharya S, Sharma N (2013) Food Processing Industry in India: S&T Capability, Skills and Employment Opportunities

Value chain actors and the role of women as seen in the food and beverages manufacturing sector

The F&B manufacturing sector in India operates at household and MSME level with a strong presence of women entrepreneurs engaged in the production of home-made products like spices, poppadum, sauces and pickles.

These unbranded products are sold in the local market via small retailers or directly to local customers. As per the value chain actors, individual women entrepreneurs play a significant role as producers and sellers of these homemade products. Other key stakeholders in the value chain include input or raw materials suppliers, village level customers, district or block level retailers and wholesalers.



The gender composition in the F&B manufacturing value chain shows the dominance of men in backward and forward supply chains, while women are key individual producers and also customers. As retailers in this segment, their presence is negligible, which is also due to limited experience in managing high-value transactions in a market set-up, especially in rural areas.



Three profiles of rural women F&B entrepreneurs were observed during the ethnographic survey with varying motivations to adopt technological platforms for financial transactions or decision-making.

- **Independent F&B manufacturing entrepreneurs:** This set of women entrepreneurs (constituting around 60-70% of the total participants) was more open for adoption of innovative technologies and was proactive in the activities across the value chain including financial management and decision-making.
- **Supporters:** The second set of women (constituting around 20% of the total participants) actively supported their husbands or the owner of the manufacturing unit to run the F&B manufacturing operations. These women had a higher role in day-to-day operations management but had limited influence over financial decision-making.
- There was a third segment of women (constituting around 10-20% of the total participants) who worked as **hired employees** in the F&B unit (DME or NDME) and were largely involved in operating food processing machines and packaging of the final product but had a limited role in financial transactions and no role in decision-making.

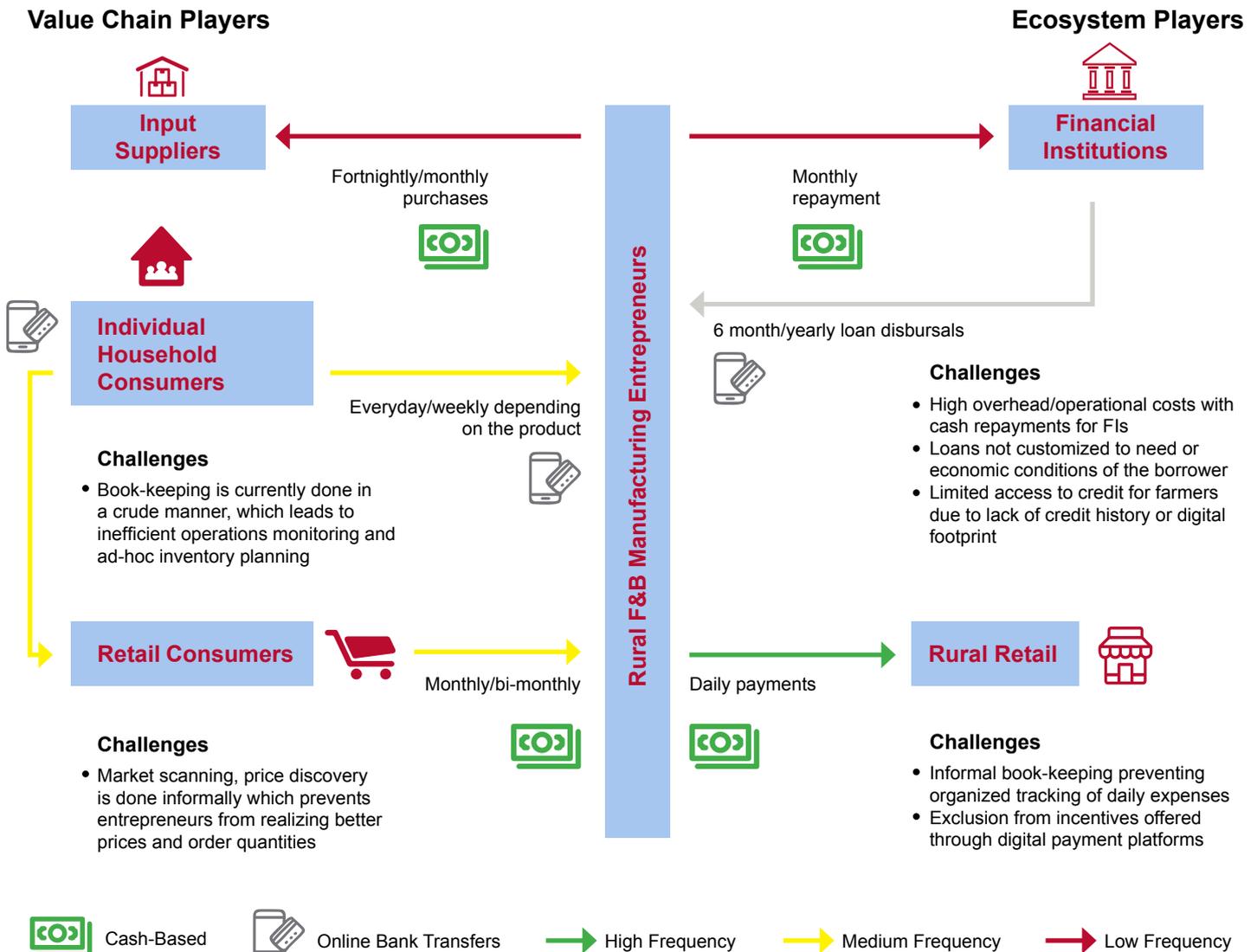
All these set of women have distinct behavioral aspects, financial needs and would need a different type of financial support. For the purpose of digitization in the value chain, the emphasis is drawn toward the first set of women F&B entrepreneurs, who show greater willingness to adopt digital interventions.

INDEPENDENT ENTREPRENEURS	SUPPORTERS
<p>Women entrepreneurs who are proactive across the value chain including managing finances and decision-making</p>	<p>Women assisting respective husband's in running food and beverage manufacturing operations</p>
Socio-economic profile	
<ul style="list-style-type: none"> • Belong to village SHG groups and maybe linked to state/district level rural entrepreneurship • Estimated average earnings(monthly): INR 5000-8000 • Higher chances of being actively guided and supported by an external agency such as an NGO/foundations • Better awareness of banking, best practices on processing 	<ul style="list-style-type: none"> • Belong to village SHG/JLG groups • No direct earning from F&B enterprise • Husband may seek support from local government agencies • Largely rely on husband's knowledge of banking, processing and business
Education	
<ul style="list-style-type: none"> • Majority with primary education or secondary education • Graduate women in a few cases 	<ul style="list-style-type: none"> • Majority with primary education • Secondary education completed in a few cases
Role	
<ul style="list-style-type: none"> • Independent management of food processing machines • Manage and record transactions with household customers • May also participate in procuring raw material for input 	<ul style="list-style-type: none"> • Assist in operating food processing machines • Assist in record-keeping and financial transactions • Limited participation in procuring raw materials
Behavioral characteristics	
<ul style="list-style-type: none"> • Confident in outsider interaction and better at explaining their challenges • Better aware of digital payments, online transfers, ATM cards; limited usage • Higher usage and more comfort with YouTube and WhatsApp 	<ul style="list-style-type: none"> • Comfortable in interacting with outsiders in presence of the husband • Largely unaware of digital payments but may have access to debit cards through husband's bank account • Usually more comfortable with feature phones
Financial needs	
<ul style="list-style-type: none"> • Procurement of additional machines for expanding or upgrading operations • Developing improved market linkages for growing revenues • Short-term capital needs for procurement of raw materials in peak demand seasons such as weddings and festivals 	<ul style="list-style-type: none"> • Short-term loans for household expenditure (education needs, healthcare needs) • Investments to develop additional products to align with evolving demands of the end consumer

Financial transaction mapping of F&B value chain actors

The financial transactions have been mapped between different stakeholders operating in the food and beverage manufacturing value chain. These transactions are assessed in terms of type, frequency and value, as observed during field interactions and also highlight specific challenges in a given segment. The assessment of transactions helps in understanding the status quo at the level of each player and how these could be addressed during the pilot interventions for digitization.

Summary of the financial transaction mapping between the key F&B value chain actors



Source: Field observations and interactions with dairy farmers in the selected locations



F&B entrepreneur ↔ Consumers:

The F&B manufacturing enterprise sells its processed products through three channels with varying transaction intensity.

Sale to an individual household consumer

- **Transaction flows and type:** Women from the local households are the primary customers for this channel. They visit the F&B enterprise to purchase the processed product. Or they have an option to bring their own raw material and get it processed on the site. In both cases, charges are levied on a per kg basis. The transaction directly takes place between the women entrepreneurs and the women customers. Payments are usually made at the point of sale in cash. It is also common for the entrepreneur to extend credit frequently to the consumers as they are from the same village community.
- **Frequency and value:** The processed products are bought on an average of every 5-10 days depending on the perishability and usage of the products being sold. For instance, a snack such as papadum or noodles is sold at a frequency of 4-5 days whereas spices or flour is bought for and consumed over a longer duration. More than 50% of the average monthly earning of F&B enterprises is estimated to come through individual household sales.
- **Key challenges observed:** Book-keeping is currently done informally or in legacy form. This leads to inefficient operations monitoring and ad-hoc inventory planning that can result in overspending or understocking. Informal book-keeping also becomes a stumbling block when the entrepreneur needs to apply for credit for business expansion and has to produce a record of business metrics such as revenues and profits.
- **Digitization opportunity:** Digital book-keeping as an integrated feature of payments solutions is likely to lead to easier credit appraisal, monitoring and loan approval due to improved digital footprint of the F&B entrepreneur and can be an important digitization driver. Moreover, DFS solution can assist F&B entrepreneurs to better integrate and manage financial transactions from the key customer segments.



Sale to a local retailer

- **Transaction flows and type:** F&B entrepreneurs also sell to a local retailer or wholesaler of processed products in the nearest village, block centre or town. An independent household F&B manufacturing enterprise usually has an informal agreement with such retailers to supply the processed output and does not explore multiple vendors in nearby areas.
- **Frequency and value:** The processed output is supplied to the local retailer once every month or bimonthly. Payments are either usually made on the spot or at the point of sale through cash or on a small credit cycle of 1 to 2 weeks. Retail sales are estimated to constitute an average, 30-40% of rural F&B enterprise's total monthly sales.
- **Key challenges observed:** Market scanning, price discovery along with book-keeping is currently done informally through interaction with key market players and people in the community. This prevents the entrepreneur from negotiating for better prices and planning better for raw material quantities.
- **Digitization opportunity:** Digital bookkeeping as part of a DFS solution coupled with tailored applications such as messaging and market information can help rural F&B businesses gain with better price realizations for the product.

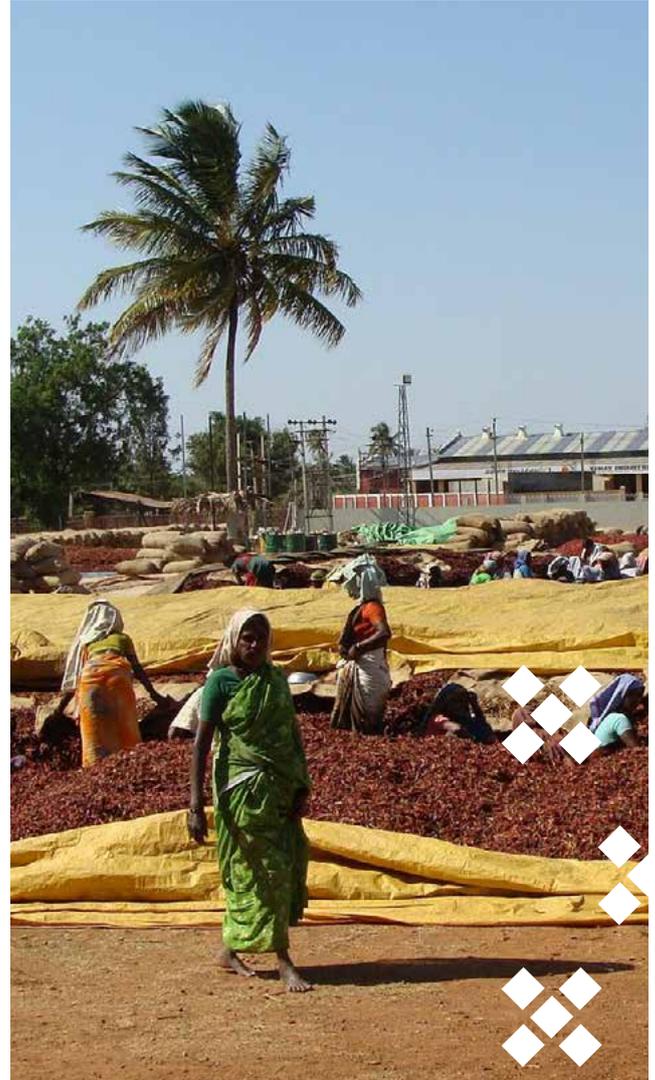
Sale to an institutional buyer

- **Transaction flows and type:** This involves sales to an institutional buyer, with a formal or an informal agreement to supply on a particular date every month. The institutional buyer is usually a large restaurant or a hotel; a commercial or office establishment in nearest town or city; or in some cases, the institution supporting F&B enterprises may themselves procure from the entrepreneur.
- **Frequency and value:** Payments are usually made through electronic means including cheques at the end of a 30-day credit cycle. For a few F&B entrepreneurs, more than 50% of the total average earnings are estimated to come from serving institutional buyers.

- **Key challenges observed:** The connection with an institutional buyer currently happens from the buyer side without any market scanning by the F&B manufacturer. This prevents the manufacturing unit from approaching buyers that can offer better prices and place larger orders.
- **Digitization opportunity:** In addition to organized record-keeping, the transition to digital mediums with tailored applications such as messaging and market information can help rural businesses gain from improved market linkages.

F&B entrepreneur ↔ **Local retailer of raw material (input suppliers):**

- **Transaction flows and type:** F&B enterprises usually procure raw material from a retailer in a nearby market or district center. A large portion of the raw material purchase transactions is conducted by men. Payments are on the spot or at the point of sales and usually in cash.
- **Frequency and value:** The raw material is purchased on an average of once or twice a month depending on the production capacity of the F&B enterprise and the demand for the products. Peak demand periods, such as weddings and festivities may attract bulk purchase without significant variation in frequency.
- **Key challenges observed:** Market scanning and price discovery process are performed informally. This prevents entrepreneurs from realizing better pricing opportunities for procuring raw materials.
- **Digitization opportunity:** An integrated DFS solution with information on market prices for food commodities and raw materials (shared in local language) is likely to spur the utilization and popularity of the DFS application. For instance, expansion of mobile wallets such as Paytm in India is attributed largely to its ability to attract merchants in different regions of India offering vernacular enabled payment platform. Similarly, mobile applications such as RML Trader from Reuters Market Light has seen good uptake where farmers receive updates on commodity process and market rates other than suggestions on improvement of farming practices.



Local retailer for raw material ↔ **District level traders:**

- **Transaction flows and type:** Local retailers have a tie-up with a specific district trader for fulfilling their raw material requirements. In some cases, retailers may also directly procure from 'mandis' or open agri-produce markets. Most district level wholesalers or traders do possess the knowledge on bank account transfers and may also have a provision to accept cheque payments, but they rarely receive a request from a local retailer to use any other medium except cash due to the low awareness of the retailer and subsequently, the F&B entrepreneur, on the benefits of digital financial transactions.
- **Frequency and value:** Local retailers purchase raw materials from district level wholesalers, mandis or traders, once in a month, for commodities with longer shelf life such as spices, cereals and grains and also according to the existing demand in the local vicinity.
- **Key challenges observed:** Traders are located far from the local retailers' location and in some cases, the retailers travel long distances to source the raw material if there is no delivery arrangement with the trader. This adds to the retailers' cost. Moreover, due to the absence of a unified platform connecting a local retail cluster to a trader, retailers have limited bargaining power.
- **Digitization opportunity:** Moreover, DFS solution can assist local retailers to better integrate and manage financial transactions from the larger traders and realize cost and supply chain efficiencies. These benefits can be then passed across the value chain to the women F&B entrepreneurs.

To summarize, inputs and raw material procurements form the bulk of payment transactions in the cash dominant F&B manufacturing value chain, with varying purchase frequency indicating a possible role for DFS to better integrate and manage financial transactions.

A majority of the transactions across the F&B value chain are cash-based, while awareness of digital and cash-less mediums have a diminishing flow, moving forward from district level traders to the end consumer. The independent F&B manufacturing enterprise has direct transactions with its customer segments and suppliers without intermediaries.

Mobile phone usage by value chain actors

- A majority of the independent women entrepreneurs in the F&B value chain own and operate a feature or basic phone largely for calling and listening to music/radio via FM channels.
- Economically better-off women entrepreneurs owned smartphones (around 20% of the total sample) but usually needed the support of someone in the family to learn about new applications and features. In most cases, women entrepreneurs borrowed smartphones from family members, primarily to access WhatsApp for communication and YouTube for learning and entertainment. High visual content clubbed with local language support were seen as important factors in the choice of application usage where both YouTube and WhatsApp have fortified their leadership positions. Facebook was also utilized by 1-2 progressive rural women entrepreneurs (less than 5% of the total sample group) to promote products, and find buyers and suppliers.
- Other ICT devices such as tablets, computers or laptops were not used by any rural F&B women entrepreneurs included in the assessment. There was no significant use of any DFS channels for making financial transactions by these women entrepreneurs. However, a strong brand association with the popular MNO providers such as Airtel, Vodafone and Reliance Jio was seen throughout the field visits.



Calling, Music (fm) - Common usage of basic phones

Retailers (input suppliers and end customers at the village level):

100% local retailers owned a mobile phone

40% were aware of digital payment channels

Calling, Social Media - Common usage of mobile phones

- Almost all the local retail establishments linked to F&B enterprises are managed and run by men who were seen to own a smartphone or at least a basic feature phone.
- Mobile phone usage is mostly restricted to entertainment and communication although many retailers were aware of digital payment channels such as UPI and popular mobile wallets such as Paytm.
- Usage and knowledge of other ICT devices were almost negligible though some of the retailers had used computers in the public internet cafes.



Large-scale traders (usually at the district level):

80% traders/wholesalers owned a smartphone

60% were aware of digital payment channels

- The large-scale traders or wholesalers were mature users of smartphones and had the greater utility of these phones to get commodity pricing and trading related information through WhatsApp or Facebook groups.
- Most traders were also aware of the digital payment applications and are most likely to have a payment application installed on their device. However, cheque and electronic money transfers were seen to be used more by this stakeholder group compared to mobile-based financial transactions.

YouTube & WhatsApp - Most popular learning and information sources for smartphone

Key insights

- A majority of women F&B entrepreneurs use basic feature phones indicating need of messages-based or USSD banking.
- Progressive women F&B entrepreneurs have access to smartphones and are more open to use DFS channels such as mobile wallets in case integrated solutions such as book-keeping are coupled with the DFS application.
- Local retailers/traders are better versed with digital technology and can act as change agents for DFS uptake in rural communities.

Summary of the mobile phone usage by key food and beverage value chain actors

Value chain actor

ICT tool usage

Purpose & usage



F&B Entrepreneur (Women)



Feature Phones



Smartphones (Android based)



Usage: Calls (High), FM (High), SMS (Medium)

Purpose: Calls (Leisure), WhatsApp (News), YouTube (Learning), Facebook (Leisure), Photos (Leisure)



Local Retailer



Feature Phones



Smartphones (Android based)



Usage: Calls (High), FM (High), SMS (Medium)

Purpose: Calls (Leisure), WhatsApp (Trading), YouTube (News), Facebook (Leisure), Photos (Leisure)



Trader/Wholesaler



Feature Phones



Smartphones (Android based)



Usage: Calls (High), FM (High), SMS (Medium)

Purpose: Calls (Leisure), WhatsApp (Trading), YouTube (Leisure), Facebook (Leisure), Photos (Leisure)

Financial behavior of the value chain actors:

Independent F&B entrepreneur (woman):

- **Access to credit:** F&B women entrepreneurs usually avail mid to long-term loans (more than a year) financing to purchase or upgrade additional food processing machinery or upgrade existing ones. The source of the loan depends on the cost of machines which can have a broad range. Machines that cost more than INR 50,000 would primarily be financed through a financial institution such as a commercial bank or small finance bank (SFB). Short-term credit may be needed for small machinery or procuring raw material for input, which could be either served by savings (in SHG groups), through partner NGOs or through informal channels (such as money lenders).

Typical sources of credit available to rural women F&B entrepreneur

S. No.	Type of financial service provider	Typical services/products offered and tenures	Key highlights
1.	Small finance bank/Microfinance institutions/NBFCs	Micro-credit products for small machinery or procuring raw material for input largely through JLG model Typical value: less than INR 30,000 Typical duration: 1 year MFI interest rate (range): 18-26% (declining balance)	<ul style="list-style-type: none"> • Easier to access loans with quick disbursements in 3-4 days from loan application submission • Less availability of MFI/SFB options that meet preferred loan value and tenure needs
2.	Local cooperative banks/Commercial banks	Individual loan products for machinery purchase Typical value: more than Rs 50,000 Typical duration: 2+ years Bank interest rate (range): 10-15% annually	<ul style="list-style-type: none"> • Low-interest rates with affordable long-term paying option • Low availability of financial transaction history makes access to loans difficult • Documentation, paperwork, loan approval process is cumbersome
3.	SHGs/NGOs	Micro-credit products for meeting working capital needs Typical value: less than Rs 20,000 Typical duration: a few months to 1 year Interest rate (range): 1-2% monthly	<ul style="list-style-type: none"> • Easier to access loans with quick disbursements • Limited value and volume of loans could be applied
4.	Money lenders/Other informal sources	On-demand credit for smaller but emergency household financial needs Typical value: less than Rs 25,000 Typical duration: weekly or monthly No cap on interest rates with interest rates as high as 10% per month	<ul style="list-style-type: none"> • Easier to access on demand loans for a very short duration

Source: Field observations and interactions with dairy farmers in the selected locations

- **Savings:** Village SHG groups were the most commonly opted instrument for savings by F&B entrepreneurs followed by saving schemes at the local banks and post office. Savings with SHGs were observed to have an option for weekly, fortnightly and monthly cycle with the facility to save as little as INR 50-100 per week. These group savings are primarily made with a goal to serve short term capital needs for expenses related to business, education or health. The savings at the local banks are enabled through a network of pigmy agents, who collect the savings amount from the door-step on a daily basis.

90% of women F&B entrepreneurs had a savings bank account, however, self-help groups are preferred for saving money.

- **Insurance:** F&B manufacturing entrepreneurs were linked to or aware of limited insurance schemes. LIC (Life Insurance Corporation) schemes have been subscribed by a minor portion of the entrepreneurs, primarily with personal goals. The machines used by the entrepreneurs are unsecured purchases with no insurance cover. It was observed that in general there is lack of awareness on insurance as well as limited access to such services in many villages in the same block.

Village level/block level retailers

- **Access to credit:** Village level/block level retailers were seen to prefer loans from formal sources including nationalized banks, regional rural banks and NBFCs operational in the area given their low-interest rates. Though the capital is usually requested for capacity enhancement, it was observed that significant capital was actually needed to meet the working capital or inventory purchase requirements. Access to credit came as a major business challenge for these retailers where alternate sources using digital technology could be leveraged for an improved loan underwriting process. A DFS system is also likely to allow a financial institution to utilize the alternate data to draw insights for past transactions and offer customized loan products to the rural retailer.

Typical sources of credit available to village level/block level retailers

S. No.	Type of financial service provider	Typical services/products offered and tenure	Key highlights
1.	Local cooperative banks/Commercial banks	Individual loan products for capacity enhancement Typical duration: 2+ years Typical value: more than Rs 100,000 Short term working capital loan Typical duration: less than 1 year Typical value: less than Rs 50,000 Interest rate (range): 10-15% annually	<ul style="list-style-type: none"> • Low interest rates with affordable long term paying option • Less availability of financial transaction history makes access to loans difficult • Documentation, paperwork, loan approval process is cumbersome
2.	SHGs/NGOs	Micro-credit products for meeting working capital needs Typical value: less than Rs 20,000 Typical duration: a few months to 1 year Interest rate(range): 1-3% monthly	<ul style="list-style-type: none"> • Easier to access loans with quick disbursements • Limited value and volume of loans could be applied

Source: Field observations and interactions with dairy farmers in the selected locations

- **Savings:** The nationalized or local banks in the area were the most preferred instrument for savings by the local retailers. Saving goals are both short term, primarily for supporting working capital and long term, for funding store expansion, children's wedding and education expenses.
- **Insurance:** LIC schemes were the most frequently subscribed insurance for personal cover and few cases of business operations insurance were noted.

Challenges and DFS opportunities in the F&B manufacturing value chain

The high volume of person to person (P2P) transactions in the F&B value chain is often recorded using rudimentary methods making it difficult to keep a track of the transactions. DFS solutions can offer an organized, efficient way to record, store and retrieve the financial transaction information.

The F&B value chain usually involves significant financial transactions between women entrepreneurs and women end consumers where purchase on credit and smaller values (less than Rs 100) is quite common. Informal bookkeeping also leads to inefficient operations

monitoring and ad-hoc inventory planning that can result in overspending or under-stocking. As the rural F&B value chain enables peer-to-peer financial transactions between known parties, it can also mitigate the fear of losing money to unknown accounts thereby driving confidence and faster uptake. A simple DFS solution that enables P2P payments for basic mobile phone users (technology such as USSD) is likely to build confidence for using digital payments among known and trusted neighbors, especially women members in SHG groups. The SHG members can further become change agents to encourage digitization in the local community.

An independent F&B manufacturing entrepreneur in Maharashtra associated with a social foundation. She conducts direct transactions for selling her processed products, hinting towards high potential for digitizing peer-to-peer transactions, shift to digital bookkeeping for gaining better understanding of the business and a dynamic market discovery process.

“Most of my customers are women from nearby households, who either purchase what I make or get their own raw material for processing with my machine. For retail sales, my husband handles most of the transactions. We record all transactions in a notebook and have no visibility of vendors outside the district.”

- An F&B entrepreneur on her sales channel.



Rural F&B women entrepreneurs usually need to avail finance multiple times primarily for business or agri-related expenses.

Loan approval for an F&B entrepreneur from a local or nationalized bank in a rural setting is a tedious process with documentation and underwriting taking 2-3 weeks to complete. Moreover, after the loan is disbursed from a local or nationalized bank, it is easy to lose track of repayments for the rural beneficiary. In addition to losing track of repayments, monthly repayments have to be made by visiting the bank branch physically at locations with limited bank branches and absence of a pigmy/BC agent network.

For financing institutions, it is difficult to distinguish a rural creditworthy customer from another based on basic KYC norms, which can augment the risk profile of the lending portfolio. Digitization of beneficiaries can lead to improved credit checks by monitoring spend and repayments data. For F&B entrepreneurs integrated with digital re-payments and lending can improve awareness and confidence in digital payments mediums. It can also result in a hassle-free loan approval which can be concluded with a shorter turnaround time of around 1-2 weeks.

Rural women F&B entrepreneurs find it challenging to perform effective market scanning and price discovery for procurement and sales.

Price discovery for procurement and sales is currently carried out informally through interaction with market players and people in the community. In addition to inefficient operations monitoring, this prevents entrepreneurs from realizing better prices and order quantities. Complimentary to a DFS solution, an entrepreneur can be introduced to a digital platform, offering a wider option of forwarding and backward channel partners, who can be linked and reached without physical travel. This can also help F&B enterprises integrate with online portals that source processed products directly from farmers to cater to growing ‘direct from farm’ products markets in the urban centers. A few agri-commerce based startups in India such as BigHaat, Farmer Friend and initiatives such as e-Choupal by ITC (an Indian FMCG conglomerate) aim to connect the rural farmers and entrepreneurs with different value chain actors such as consumers, raw material providers directly.

The shift to digital payments and breaking the cash-based habit of rural F&B merchants and entrepreneurs will need ecosystem building around digital payment and involve significant degree of behavior change in the rural community.

During the time of demonetization, which led millions of Indians to adopt cash-less mediums, the fear of losing cash to incorrect transactions, not having enough merchants with facility for accepting digital money and long queues outside ATMs to withdraw all cash from bank accounts became commonplace, even at more progressive urban centers or cities. The shift to digital mediums will initially come across as counter-intuitive to rural communities, who have very strong cash-based habits, limited exposure to banking or education and minimal usage of technology. In order to introduce digital payments in the rural ecosystem, an organic route has to be adopted which can permeate various transactions. This can be achieved by leveraging village resources and infrastructure such as SHG’s, village panchayat, common service centres and post offices. The usage of DFS channels also requires a basic level of financial and digital literacy which is lacking with most F&B manufacturing entrepreneurs and other value chain actors. Since management of finances and book-keeping emerge as key drivers of rural digitization, a parallel effort would have to be initiated to educate value chain actors on benefits of efficient financial management, in collaboration with payment solution providers, lending financial institutions and livelihood promotion agencies in the area. This will not only require training but the development of a support network comprised of more educated members of community, schools and SHG groups which are able to address concerns and promote management of both household and business finances.

❖ 3.3 Rural Retail Value Chain as an Enabler



Value chain description and role as an enabler

50%+ of the estimated 16 million retail outlets in India are based in rural areas.

<500 sq. ft. size of majority of rural retail stores.

India's rural FMCG market contributes to nearly 1.3% of India's GDP and has high participation of women with over 2.4 million women-led establishments operational in India.²⁵

Rural retail has been heralded as the new frontier for achieving steady growth in consumer base and revenues. Since 2000, India's rural areas have recorded faster per-capita growth and spending compared to urban areas. The rural retail market has grown steadily and is likely to reach a market size of US\$220 billion by 2025 growing at a CAGR of 14.6% largely driven by digital connectivity in rural areas due to the high penetration of smartphones, credit and debit cards.²⁶ The rural retail segment is dominated by unorganized independent, owner-managed shops, majority of which are often set up within household

premises. The majority of the rural market in India is extremely price sensitive and performance of markets remains closely connected to the agriculture output in the year.

The hyper-local retail or 'kirana'²⁷ shops in rural India sell a range of consumer goods for daily consumption and plays an integral role in the rural economy.

The value chain players in this segment include large distributors or stockists in urban areas or at the district level who purchase products directly from the large FMCG companies. 'Wholesalers', active in smaller towns or blocks, subsequently purchase from the distributors and sell products to the local retailers in rural areas. The customers of these retail shops largely belong to the adjoining villages.



Women play a key role in owning, running and managing rural retail stores, which are often set up within the house premises to augment household income.

The economic census indicates that livestock, small scale manufacturing and rural retail sectors have the highest percentage of women entrepreneurs in the country. Even in cases where ownership of rural retail stores is with men; women manage the rural kirana or retail stores during the

day time. Many of these rural men often find employment in cities or nearby districts, such as in construction and therefore, rural women often take the role of managing and running the rural retail stores. Women also play a key role in influencing the purchase decisions of rural households, especially with children and women customers. In some cases, shops are also run by women through the assistance of SHGs and they also contribute through door-to-door/direct sales.

²⁵Economic Census 2016

²⁶ASSOCHAM study on the rural consumer goods market, 2017

²⁷Kirana shops - Retail shops in India selling consumer goods products

Two business models of rural retail: the village level entrepreneur (VLE) and own account worker model are seen in rural India. Women entrepreneurs associated with the VLE model are more likely to adopt innovative technological interventions.

- The VLE model is primarily employed by larger FMCG and consumer durable organizations to catalyze behavioral change and uptake of company-specific products in rural settings. A VLE is mandated with the task of conducting door-to-door visits, educating rural consumers on the benefits of a product, and driving sales.
- An own account worker owns a kiosk or small store in the village which is often located in the house premises. In many cases, these workers are supported by an aid agency or by an NGO to manage the retail store better. The women entrepreneurs receive guidance and inputs from these stakeholders to run business operations. These rural retail stores are usually brand agnostic and can be found selling different products ranging from consumer goods, food grains, stationary and larger items such as clean energy lighting and water filters.

The VLE model was noted to instill confidence in women and build strong entrepreneurial skills since it is usually driven by professional teams at larger companies or foundations. Moreover, the VLE model is often more suited to train rural women on the usage of ICT devices such as tablets and mobile phones for recording consumer feedback and conducting financial transactions.

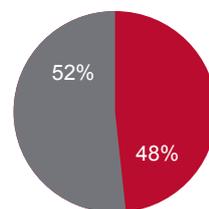
Snapshot of the rural retail sector in India



1.3% rural FMCG contribution to the GDP of India
 Rural FMCG market: USD 29 billion (2016)
 Expected growth rate: 20% (with rural India driving the growth)



No. of women establishments
 ~2.4 million units



■ Rural retail establishments
 ■ Urban retail establishments



Rural retailers faced key challenges of unpredictable cash flows, price sensitivity

<Rs 20 - average spend observed in rural retail stores per customer per transaction

Some of the key challenges faced by rural retailers were related to unpredictable cash flows that occur due to high dependency on the agriculture output and rains for consumer purchases; extreme price sensitivity and the low value of transactions by rural consumers and difficulties in brand or product communication and promotion. Expenditures on consumer goods contributes to close to 15% of the total expense basket of rural areas.²⁸ It is also estimated that approximately 40% of branded sales of daily use products takes place in rural areas. However, it is to be noted that the most of rural market is extremely price sensitive and the performance of the markets remains closely connected with agriculture output and monsoon rains in the year. Moreover, the average transaction size per customer per transaction was observed to be much lower (less than Rs 20 in the field locations visited) although the purchase frequency was very high at an average of 1-2 transactions per day.

²⁸IFC household consumption database, 2010

Challenges and DFS opportunities

Integration of digital payments into rural ecosystems will directly depend on sources, such as spending in rural retail stores which can ensure sustained usage.

While targeting a dominant value chain in the local area provides a good starting point, rural retail stores have the ability to catalyze uptake and ensure sustainability of digital payments. Rural kirana stores are often one of the first points of the transaction for people in the village after they receive their monthly earnings. Hence, kirana stores become a central link in maintaining the digital ecosystem of a village. Enabling digital payments to merchants through mobile payment solutions, Micro ATMs or PoS based transactions, initially through assisted methods can go a long way in instilling confidence among rural users for using digital payment platforms. However, on-boarding kirana stores in the DFS ecosystem is a challenging task as many of these businesses are wary of 'digital history' of transactions that would potentially deny them government sops²⁹ or benefits as well as put them under the ambit of income tax department. Education and communication on the benefits of DFS would mitigate the distrust of these store owners of DFS channels.

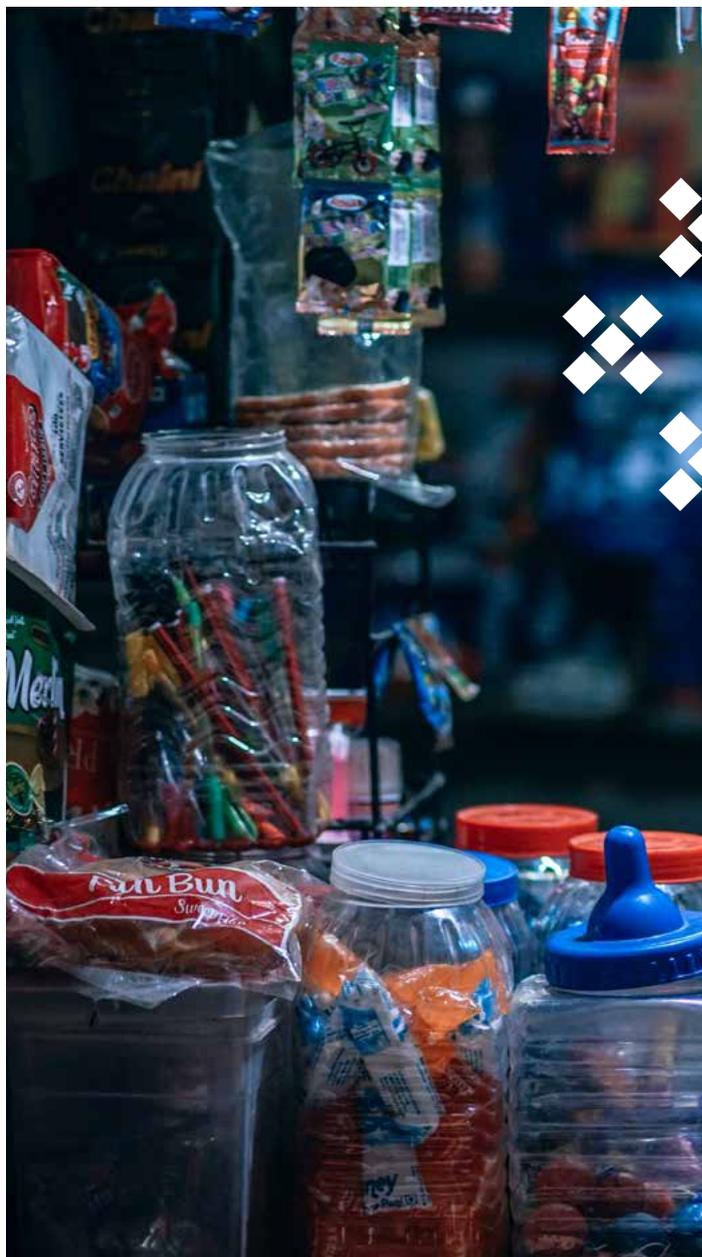
Rural retail store managers could be utilized as change agents to drive behavior change communication given their level of trust and long term presence in the village community.

People in rural communities are more strongly rooted in community values, where each business unit located within the village is accorded with special importance. Rural retailers are a crucial point at the intersection of multiple value chains in rural areas and can provide an accurate understanding of the behavioral aspects of the local community. These retailers could be potentially utilized as change agents for driving behavior change communication on sustained use of DFS channels in the local rural community. Payment banks, financial services institutions and fintech could potentially incentivize these retailers to promote DFS in the local community so

as to enhance the market penetration of the DFS players. Moreover, rural retailers regularly interact with wholesalers, distributors and NGOs for business and hence stay better informed on developments in technology, banking and other services. They may be a part of the block or district level trading groups which enables them to have access to a wider network of people and knowledge. Although, the knowledge acquired by retailers is more generic rather than knowing specific technical details, it is sufficient to position them as information relay points for the village community. However as noted earlier, rural retailers may be suspicious of digital histories being created on the sustained use of DFS and need to be adequately trained and informed on the benefits of the use of DFS channels.

To enhance digital payments, rural kirana stores can also be viewed as the extended arms of a financial institution such as a commercial or a payment bank that may have limited outreach or high costs of operations in rural areas.

While it is easy to imagine an early adopter becoming instantly comfortable with using digital payments in urban areas, a rural consumer will find the transition aberrant at first. A cash-habituated customer would likely identify the nearest cash-out point and withdraw the money immediately after receiving a digital payment. Rural areas still don't have a strong ATM network and if rural consumers fear that there won't be an option to cash-out, adoption of a digital payment platform from the start can become daunting. Here, both private and government banks can help by installing Micro ATMs at retail stores offering cash-out and cash-in functionality to alleviate any first level fears. However, suitable provisions must be made to monitor and evaluate the performance of rural kirana stores on transparency and storage of financial transactions to avoid fraudulent activities.



²⁹Tax benefits or concessions given by the Indian government to boost private sector activity

The digitization of rural retail is as much about building a buy-in from retailers as it is from consumers. Crossing the divide from cash intensive to cash-less model will present layers of challenges for a retailer.

- **The absence of aggregators:** Rural FMCG retail chains in India are not generally associated with any dedicated aggregators that work with retailers on building capacity, scaling businesses and assisting in availing finance. There are a few non-FMCG retailers who are supported by foundations and NGO's, which offer selected items such as clean energy products and personal wellness items. Rural retailers can also be part of village-level groups, but such groups are mandated with addressing challenges that concern the overall development of the village. The absence of an influencer group or aggregator implies the need to onboarding each retailer individually, which can lead to extended timelines and in-efficient monitoring. In absence of such aggregators, village level groups can play an important role to mobilize and motivate retailers.
- **Lack of incentives:** Rural communities are extremely price sensitive and incline towards resisting any change that doesn't offer incremental benefits relative to the status quo. While digitization offers long term benefits for the development of the businesses, presently, there are no immediate incentives offered by solution providers for retailers. In order to build a self-sustaining cycle of promoting digitization through retailers, benefits such as better transaction rates on digital transactions, cash back on new users added through referral codes and opportunities to win rewards through competing with other retailers, can nudge retailers to shift to using and encouraging digital payment modes.

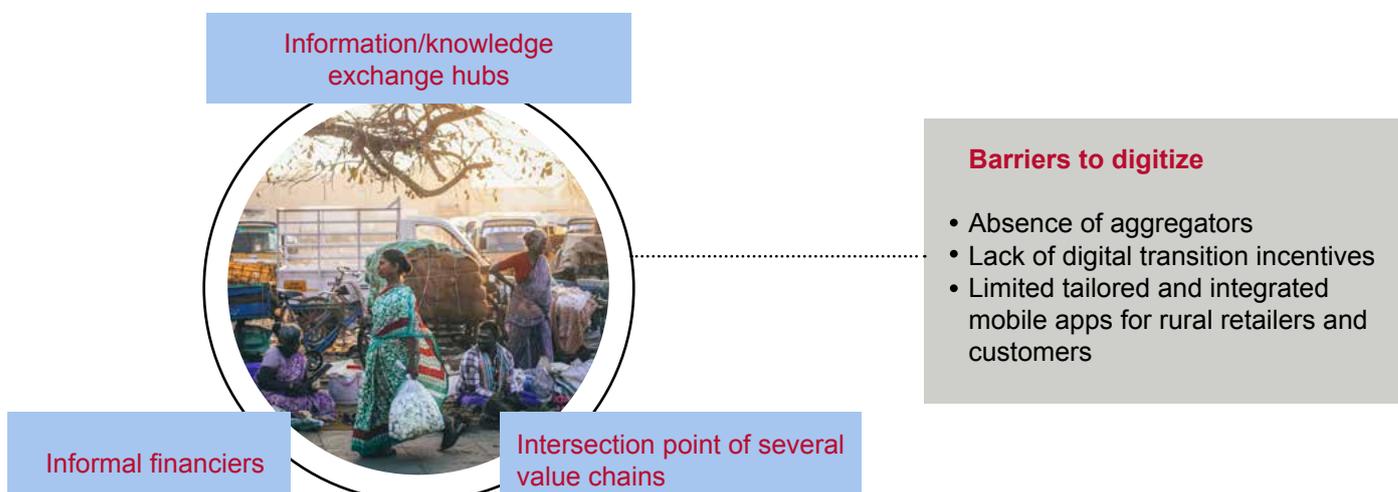
Incentivizing digital merchant payments in India

The government of India, acknowledging the significance of financial incentives for merchants has launched schemes like BHIM Aadhaar Merchant Incentive Scheme and BHIM Cashback Scheme for merchants to promote digital payment methods. In addition to this, in 2017, the government also decided that the Merchant Discount Rate (MDR) applicable on all debit cards, BHIM UPI and Aadhaar Enabled Payment System transactions upto INR 2,000/- will be borne by the government for a period of two years with effect from 1st January, 2018. While it is too early to comment on the success of these schemes that promote DFS, merchant payments through UPI (Unified Payments Interface) in February 2018 was at INR 191 billion, and nearly doubled to that of November 2017, once these schemes were announced.

- **Limited payment applications tailored for rural needs:** Replication of digital payments solutions designed for more literate, digitally and technologically more aware populace to rural geographies is bound to augment the challenges toward uptake of such applications. Borrowing from other industries that have designed tailored product and service offerings for the rural ecosystems, a digital payments provider would need to consider the development of rural version of the solution. Features such as local language support, step-wise guidance through visual aid, voice assistance and other features that take into account local needs and convenience are needed. Moreover, retailers have to be treated as a small business and the digital application should also have features to improve business productivity and efficiency.

The rural retail ecosystem as an enabler to digitization

Role of rural retail as enablers



Access to microcredit and new sources of income through DFS innovations is likely to motivate rural women managing retail stores to act as change agents and drive DFS adoption in local rural communities.



A rural retail store in Mohol block in Maharashtra that sells all items from small consumer goods such as footwear, women wellness products to food product items. The majority of the day-to-day financial transactions in these stores are less than INR 100 and women and children of the rural households are the main customers.

“Most of our customers are within the village premises and are well known to us. Payments are usually in cash and at the point of sales but also on credit for regular customers. All these transactions are recorded in our notebooks and cleared at the beginning of every month which leads to sudden cash inflow every month. We are open to adopting financial solutions that will assist us to manage this cash better.”

- A rural store woman manager on her financial needs and hassle of managing cash.

Digitization of the rural retail stores will be a critical requirement for digitizing the rural ecosystem and ensuring sustained usage of cash-less mediums. There is enough merit to suggest that a domino effect of digital transactions can be initiated by digitizing rural retail. Women are likely to play a key role in this transition as they manage these retail stores and have a good understanding of the behavioral aspects of two key buyer segments: children and women in the rural community. Upon adequate training on behavioral change aspect on the usages of digital payments, these women are likely to be more acceptable as change agents in the local community. However, many of these women rural retail managers and owners have distinctive short-term capital needs for meeting the inventory and purchase needs of the customers. Facilitating this access to credit through increased participation in the village Self Help Groups and opening new sources of income through setting up banking correspondent channels are likely to mobilize more women retailers to act as change agents on DFS adoption in the local community.



3.4 Microfinance Institutions as an Enabler



Value chain description and role as an enabler

Microfinance institutions are at the heart of the rural economy and can act as a key enabler in facilitating digitization across multiple value chains due to their significant scale of operations.

Microfinance in India evolved as a development approach to benefit the economically underprivileged population that faces difficulty in accessing institutional finance largely due to intermittent nature on the source of income and cash flows as well as the absence of a financial transaction history. It is estimated that there are approximately 40 million borrowers for MFI loans in India with nearly 90% of the clients as women.³⁰

MFIs are primarily focused on extending financial services in the form of credit amongst unserved or underserved markets.

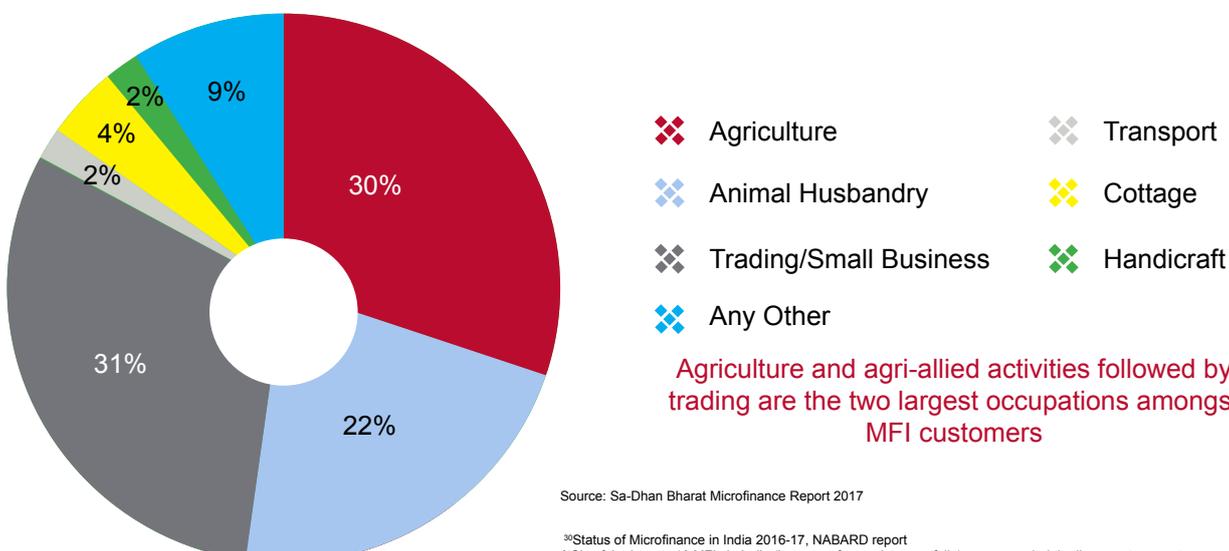
MFIs have a primary focus on extending credit amongst unserved or underserved markets and have a key role in fulfilling the funding gap in this sector. MFIs typically

provided small-ticket income generation loans to their new customers. As customers mature over multiple loan cycles, there is a greater emphasis on graduating clients from income-generating loans to consumption as well as larger ticket-size loans.

The microfinance sector also has a pan-India geographical presence.

This scale of operations is also reflected in the sectors pan-India presence and operations. In 2016-17, MFIs were operational in 598 districts across 29 states and 4 union territories through a network of 10,233 branches (excluding 6 SFBs) covering almost 90% of the total geographic landscape and an actual growth of 6% (factoring in 6 SFBs' exit as MFIs)³¹. As per the current (FY2017) regional distribution of portfolio (GLP), South India accounts for the largest share of the total industry portfolio at 31% followed by the North (27%), West (24%) and the East (18%).³²

Distribution of MFI clients occupations



Agriculture and agri-allied activities followed by trading are the two largest occupations amongst MFI customers

Source: Sa-Dhan Bharat Microfinance Report 2017

³⁰Status of Microfinance in India 2016-17, NABARD report

³¹Six of the largest 10 MFIs in India (in terms of gross loan portfolio) were awarded the licenses to operate as small financial bank (SFB) by RBI in Sep 2015 (https://www.rbi.org.in/scripts/BS_PressReleaseDisplay.aspx?prid=35010)

³²Sa-Dhan Bharat Microfinance Report 2017

The microfinance sector is primarily focused on serving women and financially excluded borrowers.

World over the focus of microfinance has always been on serving women. In India, microfinance serves a large segment of people from Scheduled Castes (SC), Scheduled Tribes (ST) and minorities, functioning as an alternate vehicle of credit. Women clients constitute 96% of the total clients of MFIs. Similarly, SC/ST borrowers also constitute a substantial chunk (20%) of the clients. Focusing on microfinance services towards women, SC/ST and minorities, MFIs are contributing significantly to the well-being of the underprivileged, by providing access to credit and promoting the financial inclusion agenda. The gender composition in microfinance sector shows women's participation largely as clients of these institutions. The field executives are mostly men due to mobility constraints among women, nonetheless, there is an increasing trend of women's participation as collection agents in India. The employees at MFIs include both men and women, although numbers are skewed in favor of men.

The microfinance sector is also focused on rural customer segments.

The last few years have also seen a resurging emphasis on serving rural segments. Prior to 2015, Indian microfinance was touted as primarily a rural phenomenon. In FY13, the MFI industry had 67% of its customers based in rural areas.

The trend, however, shifted to focus on more urban clients since the microfinance crisis of 2010-2011. As of 2016, only 38% of the active customers were based in rural areas and 62% in urban areas. 2017 saw a resurgence in rural customers (61% of total) primarily due to the exclusion of 6 SFBs, which suggests that the majority of the small sized of MFIs tend to be rural centric.

MFIs serve customer segments from varying income generating activities and thus are involved in end-user financing across multiple rural supply chains.

Traditionally, MFIs have been lending for both consumption and productive purposes. It is believed that poor people use their loans for emergency and consumption needs more than for livelihoods. In 2016-17 the proportion of income generation loans to non-income generation loans stood at 85:15. Amongst these income generating loans, trading and agriculture represented 30% respectively whereas agri-allied activities such as animal husbandry represented a further 22%.³³

Thus, as MFI loans are primarily given for income generating activities across multiple rural occupations such as trading, farming, food and beverage manufacturing, dairy production, MFIs have an important role across multiple rural supply chains, especially with respect to financing.

Distribution of rural-urban clients in MFI industry



³³Sa-Dhan Bharat Microfinance Report 2017



Key digital initiatives as seen in the microfinance sector

MFIs can extend the level of loan value made available through the use of alternate data generated from digital transactions and facilitate reduced pricing as well as customized product offerings.

Digital technologies are disrupting the high cost of credit assessment and verification. Using specialized algorithms, providers can analyze information directly available on a customer's mobile telephone (e.g. frequency and amount of airtime top-up) and non-traditional data (e.g. social media profiles), to develop the credit profile of a client when making lending decisions.

While credit underwriting has traditionally focused on an applicant's capacity to pay, it is now shifting toward propensity-to-pay models (scoring accounts based on their likelihood to pay), that look at specific character traits of the applicants.

Another big data-driven model that is showing promise is the use of psychometric evaluations. The Entrepreneurial Finance Lab (EFL) psychometric tool has applicants fill out a 25-minute questionnaire administered by the lender, and in less than 10 minutes EFL generates a credit score. The score is based on the applicant's answers to questions capturing information that can predict loan repayment behavior, including the applicants' attitudes, beliefs, integrity and performance. Psychometric data has the potential to reach more people than traditional banking, as everybody has psychometric data/information even if they don't have collateral or social media profiles. It also allows lenders to assess specific characteristics, such as entrepreneurial aptitudes, which is critical when funding MSMEs. Such interventions thus enable MFIs to evaluate customers more comprehensively across multiple dimensions and further extend credit based on a more accurate assessment.

Being a core part of rural women lives, digital MFI lending can significantly add to promoting digital uptake and behavior change management. An ecosystem based approach to facilitate the digitization of payments would require MFI participation.

A majority of microfinance customers are involved in income generating activities across multiple core rural value chains. As noted earlier, over 50% of the MFI customers in India are involved in agriculture and agri-allied value chain and a further 30% are involved in trading. Thus, while digitizing core value chain operations and the surrounding rural ecosystem, existing MFI women customers could be targeted as the first set of beneficiaries and change agents given their comfort level on the use of financial services and likely better adoption of DFS channels.



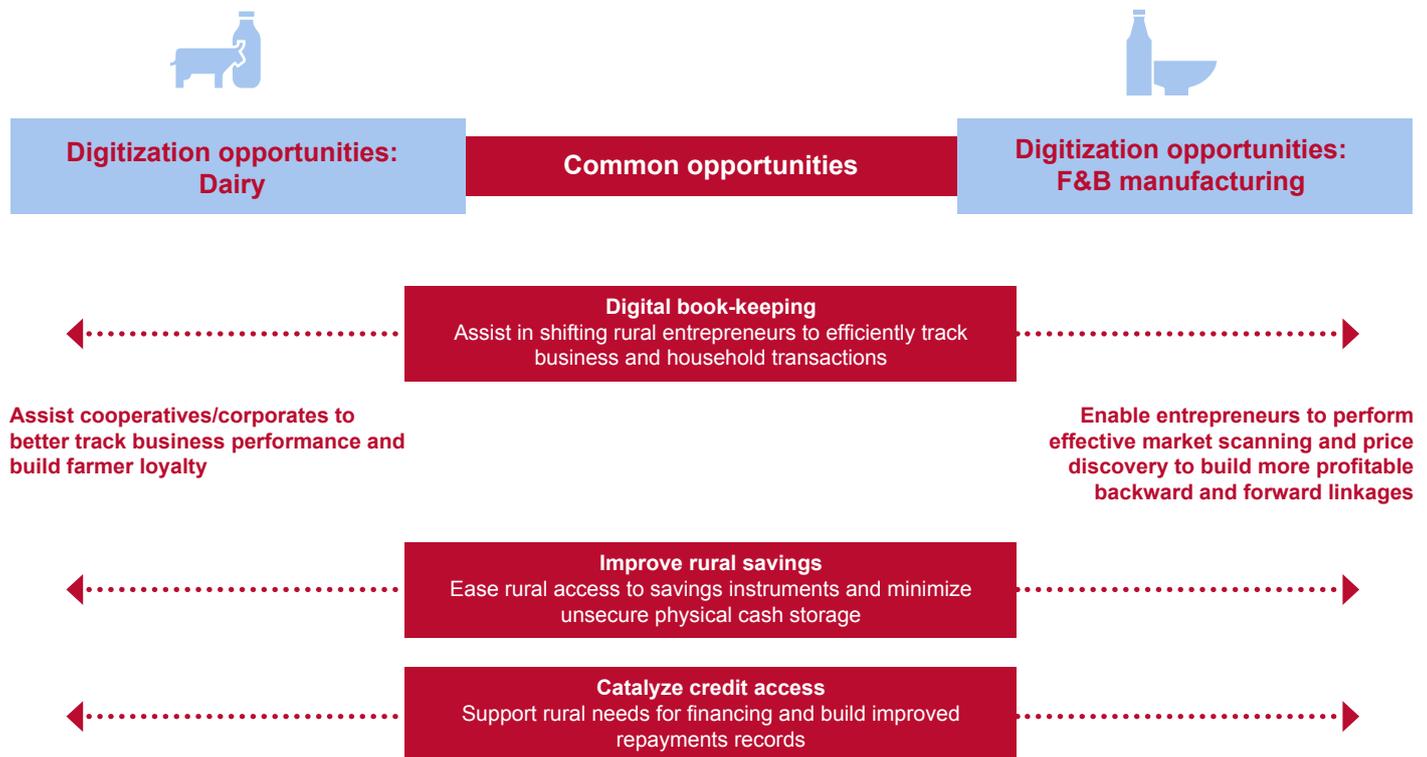
DIGITIZATION OPPORTUNITIES AND PILOT DESIGN FOR DFS VALUE CHAIN INTEGRATION

❖ 4.1 Digitization Opportunities across Rural Value Chains

Digitizing rural value chains in India requires insights into the financial transaction ecosystem and a deep understanding of the local community's motivations and aspirations for embracing technology. Many of these motivations and aspirations are not apparent while directly interacting with people in low income communities in backward areas as the subject often steers to previous exposure to DFS technology and mobile phone usage. However, dissecting the transaction flows between all

the value chain players, analyzing the earning of farmers or rural entrepreneurs and understanding the spending behavior reveal the leading digitization opportunities across the selected value chains covered in this report. These insights have been utilized to build a case for testing innovative DFS solutions in the dairy and F&B manufacturing value chains through pilots for each value chain, which will be supported by Intellecip in the coming months with funding from USAID's mSTAR project.

Digitization opportunities as seen across the shortlisted value chains for dairy and food & beverages



Summary of digitization opportunities seen across multiple rural value chains:

- **Catalyze credit access**

Formal financial institutions often have a good understanding of the credit needs of the rural entrepreneurs or farmers but often lack the adequate credit or transaction data to develop underwriting tools for assessing credit worthiness. DFS channels provide a solution to build and track financial transactions of rural consumers, and hence can hasten up the process of suitable credit product development, credit appraisal, monitoring and approval.

- **Improved rural savings**

Savings form an integral part of the cash management habits of rural household. Rural areas with a presence of bank branches or a business correspondent/pigmy agent network are able to attract a larger savings base. However, for rural consumers reaching to the nearest bank branch for money deposit or withdrawal as per convenience is a major challenge that contributes to the need to store savings in cash. DFS solutions can address this challenge by allowing rural communities to save conveniently within their village vicinity into safe and interest bearing options such as those offered by different payment and commercial banks in India.

- **Digital bookkeeping**

Both in the dairy and in F&B manufacturing, the recording of financial transactions is done in a rudimentary and traditional way with limited scope to track previous transactions or business performance. Digital bookkeeping integrated with a DFS solution can assist F&B entrepreneurs to better integrate and manage financial transactions, both for their business and household level. Moreover, they can enable easier credit appraisal, monitoring and loan approval.

- **Digitization opportunities for the dairy value chain**

Dairy co-operatives and corporates usually work with a network of collection centers or milk collection societies. These collection centers are further linked to multiple dairy farmers that deposit their daily milk production at the centers. There is a significant opportunity to digitize the payments to farmers directly from the dairy co-operatives and corporates with the role of the collection centre as a possible transaction hub through Micro-ATMs.

Another major challenge that dairy companies face is the frequent shift of dairy farmers from one collection centre to another based on convenience and price offered. Using DFS channels, dairies can gain an improved idea of performance of collection centres and individual farmers. Moreover, through comprehensive data based insights, dairies can develop incentives for the farmers associated with them in collaboration with lending and insurance partners.

- **Digitization opportunities for food & beverage manufacturing**

Presently, rural F&B manufacturing enterprise do not proactively engage to discover better prices for inputs or negotiate higher prices for their processed products. Organized record-keeping and a transition to DFS channels can also support F&B entrepreneurs in performing effective market scanning for input suppliers and retail/institutional customers.

There is a significant scope of an integrated DFS solution that can provide information on market prices for food commodities and allow the creation of a market place model for small F&B enterprises and potential consumers, leading to more viable and sustainable rural F&B businesses.

There is a significant potential for electronic payments between large buyers and F&B entrepreneurs given that the value and volume of transactions are high. However, for the sustained use of DFS, the ecosystem around F&B entrepreneurs, especially on the purchase of inputs, needs to be digitized.



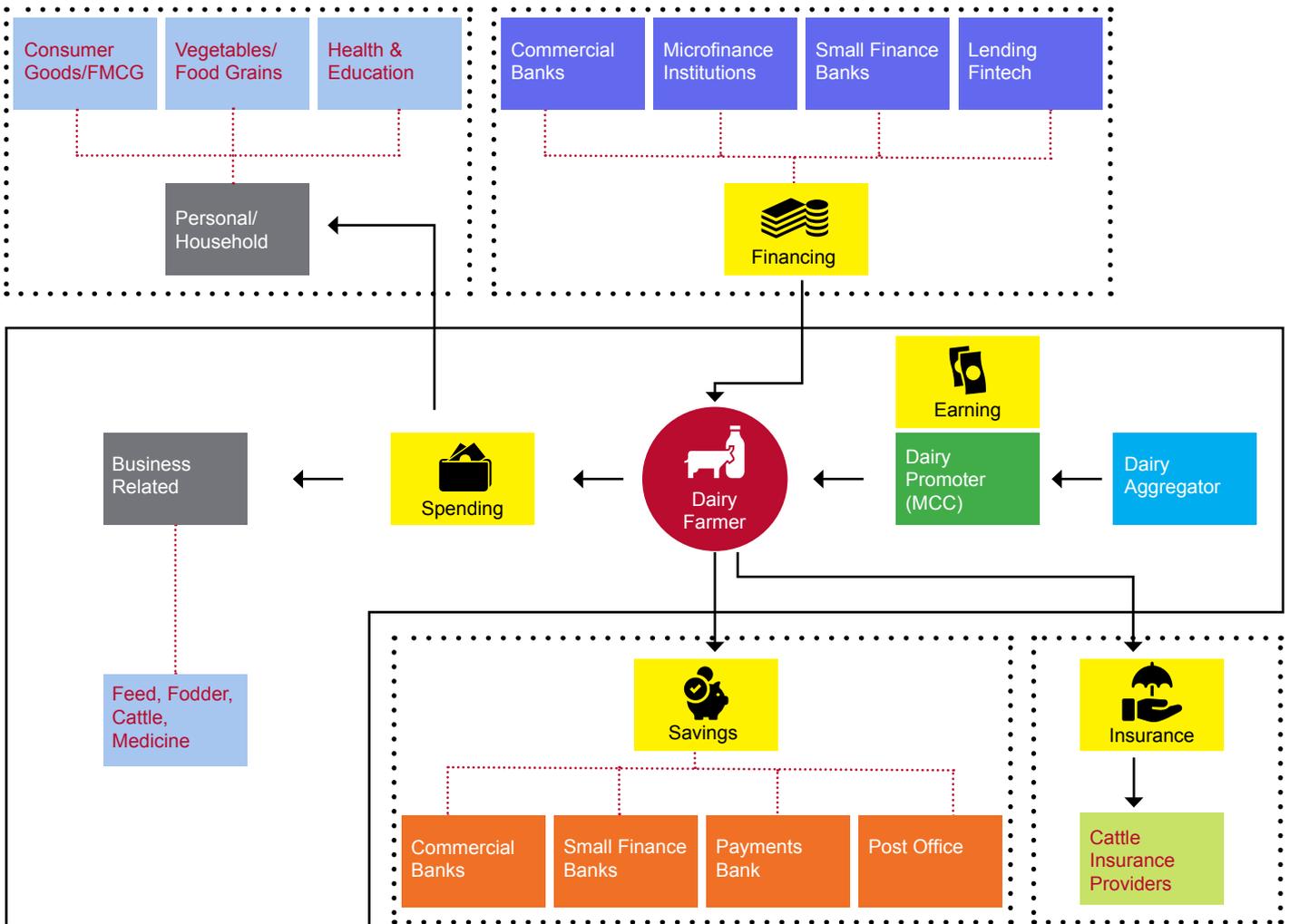
Building a sustainable digital financial services rural ecosystem

The financial inclusion of low income rural communities with formal financial channels is one of the key development agenda items of the Indian government. For better uptake of DFS within low income and rural communities, it is important to develop a digital financial rural ecosystem, where multiple value chains and transactions feed into others, to achieve cost efficiencies and a sustainable working model. The overarching mission of the pilots, therefore, will be the creation of a self-sustaining cycle

that aligns the interests of all partners and actors, and enables a simultaneous process of collaboration and learning. While the core value chains operating in a rural area provide a good starting point toward digitization, driving communities to adopt digital mediums in the long run would require mapping associated transaction outside the core value chain, primarily the spending, savings and financing flows of the rural communities.

The proposed pilot model for the dairy value chain and the food & beverages (F&B) value chain is shown below.

Proposed dairy pilot model

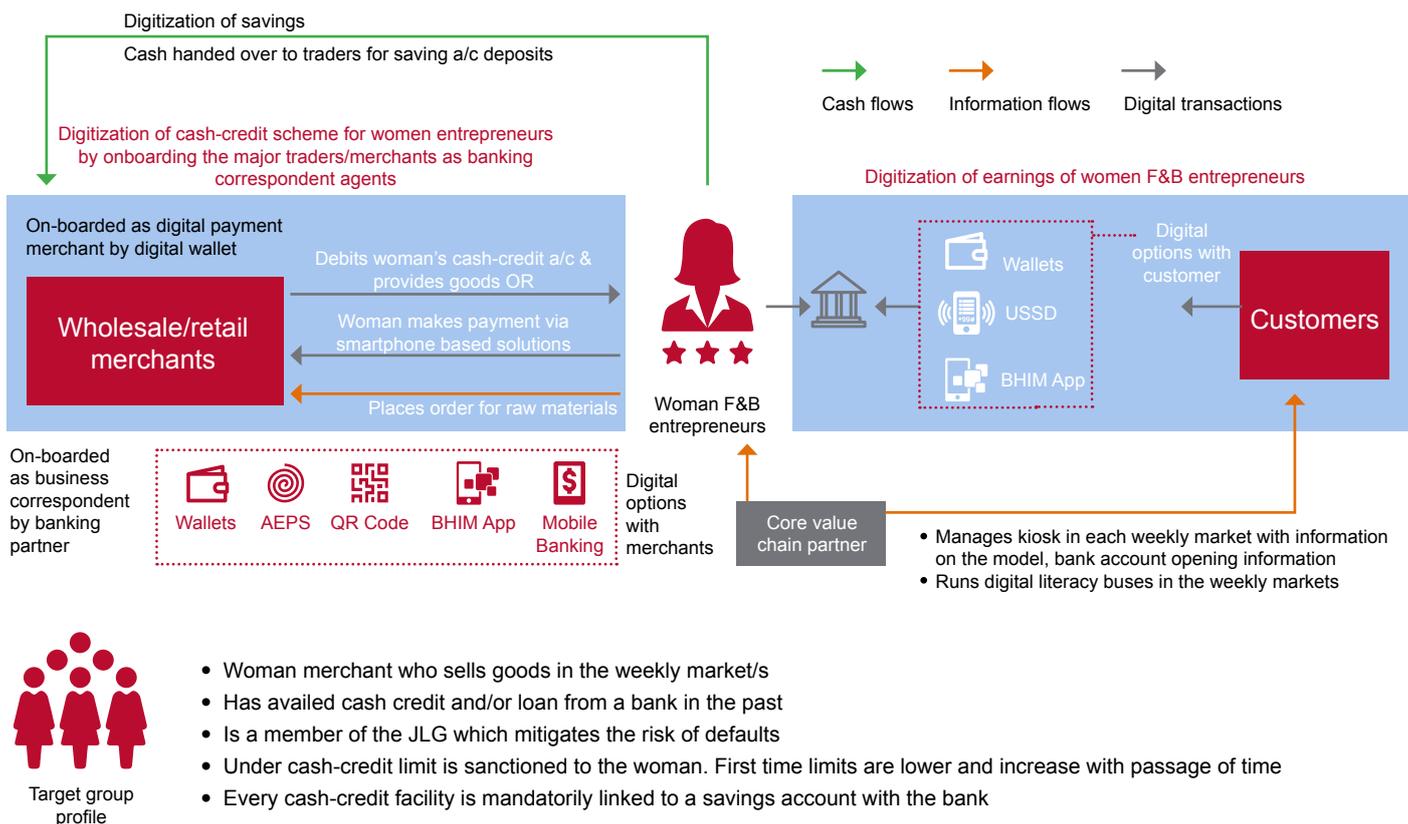


⋯ Ecosystem

□ Core Value Chain



Proposed food and beverages (F&B) pilot model



Digitizing the core value chain

The core value chain constitutes the earning and business related spending of a rural entrepreneur or producer. The digital transfer of an entrepreneur's earning or income into a bank account is the necessary first step toward adoption of digital mediums. For a community strongly habituated to working with cash, the immediate response to receiving income digitally will be to cash-out the entire amount in

order to start spending, which would necessitate the integration of two important components: access to cash-in and cash-out points via a BC network and simultaneously digitizing the spending ecosystem. Value chain spending refers to the purchase of business inputs, and therefore, digitizing input retailers will become critical in enabling cash-less core value chain.

Creating multi-layered drivers and value propositions for DFS across the value chain

- **Digitize core business payments:** The starting point of the digitization drive should be the electronic business payments of income by core value chain actors to rural women. This becomes the push factor and anchor driver in the DFS pilot as it will help in building the confidence in electronic payments within the rural community. To further build the confidence on DFS channels, suitable banking correspondent points within the village community are needed to ease cash-in and cash-out. The collection center managers in dairy value chain who deal in monetary transactions and have good level of trust in the community should be enrolled as BC agents.
- **Enable personal spending using DFS:** Once the initial level of trust has been developed with electronic payments, the next step is to create an ecosystem of digital spending in the rural level. This will imply digitizing spending hotspots such as inputs providers, village retailers or 'kirana' stores, healthcare/pharmacy provision shops and education institutes. This will make sure that a reasonable share of the money stays digital and does not get cashed out immediately.
- **Enhanced access to finance/credit:** With a sustained use of DFS channels both for earnings and spending, a financial transaction history of rural consumers would be created that could be utilized to offer business loans such as cattle financing and working capital loans for procurement of raw materials as well as consumption loans. Rural consumers would need suitable tools such as smartphones to enable digital payments, and therefore mobile phone financing could be a good starting point in the initiative.
- **Enable savings:** Having instantly encashable and transactable bank accounts would allow rural women to start saving money in these accounts and earn interest versus keeping cash in the house and spending it on non-critical items, as is the case currently.

Value proposition for the value chain actors

Each stage to build a digital ecosystem will be implemented by leveraging a partner network for critical components such as enabling infrastructure, training, community engagement and payment technology. In order to successfully onboard partners, the core value-proposition around financial and business opportunity will have to be identified. This will result in sustained engagement with the ecosystem stakeholders that goes beyond the duration of the pilots. While the value proposition is based on the pilots that Intellectap plans to implement as a result of this assessment, these could also apply in other identical cases working with similar set of stakeholders in the value chain.

Pilot value proposition framework

Value Proposition Type		Value Proposition	Potential Partners	Value Proposition for the Partner	Expectation from the Partner
Business/Personal	Financial/Non-financial				
Value Chain Business	Financial	Payments <ul style="list-style-type: none"> Electronic payments to farmers and input providers for improved business efficiency 	<ul style="list-style-type: none"> Payments bank Wallets/payments fintech SFB/PB self-help groups 	<ul style="list-style-type: none"> Building rural current/savings accounts without branch network Build low income customer segment database/portfolio 	<ul style="list-style-type: none"> Strong BC network and capacity to onboard Micro ATM services Vernacular SMS/ USSD payment option
Value Chain Business	Financial	Financing <ul style="list-style-type: none"> Payments data-based individual instant loans 	<ul style="list-style-type: none"> MFI Small finance banks Private sector banks Lending fintechs 	<ul style="list-style-type: none"> Improved digital disbursement penetration Drive individual loans basis payments data Digital EMI collections 	<ul style="list-style-type: none"> Undertake small ticket sized loans Adopt payment data-based scorecard approach
Personal	Financial	Payments <ul style="list-style-type: none"> Digital savings, instantly accessible without travel P2P and consumer to merchant payments 	<ul style="list-style-type: none"> Payments bank Wallets FMCG companies Self-Help groups 	<ul style="list-style-type: none"> Building rural current/savings accounts without branch network Increasing rural market fee income 	<ul style="list-style-type: none"> Offer zero-balance a/c Strong BC network and capacity to onboard Micro ATM services Vernacular SMS/ USSD
Value Chain Business	Non-Financial	Record-keeping	<ul style="list-style-type: none"> Value chain aggregators Corporates 	<ul style="list-style-type: none"> Improve transparency in operations Better record keeping of activities Overall improved turnover 	<ul style="list-style-type: none"> Access to large women customer base Build trust

The value propositions for designing the pilots include those pertaining to ease and security of payments, access to formal financing from formal financial channels and digital record-keeping for transaction history. These value propositions will be uniquely applicable to key stakeholders across the value chain:

1. **Payments:** Payments refers to extending digital payments channels and the necessary infrastructure to rural and low income customer segments in order to facilitate an ecosystem with lower cash storage risk and better financial management at household and business level. Digitizing payments in rural geographies faces critical challenges such as limited banking penetration, lack of digital and financial knowledge and low adoption of mobile-based passed payment solutions.

As part of the pilot, Intellectap will partner with digital payment solution providers to design the technology intervention strategy with the financial institutions to enable design of suitable financial products and with the behavior change partners for better uptake of DFS in the payments cycle. Payments can be broadly segregated into two main sub-categories:

- **Earning** – The income payments which are made across the core value chain can provide a suitable starting point to initiate the digital transaction flow to a rural customer's account.



- **Business and personal payments** – This refers to the range of payments that are made either for purchasing raw material and inputs for a business or household expenses incurred on daily needs (vegetables, milk, FMCG), transportation, savings, mobile and DTH recharge, utility, education and medical expenses. It becomes imperative to focus on all critical expenditures to build utility for digital money in a rural ecosystem.
2. **Financing:** Financing refers to increasing access to credit to rural customer segments. Presently, these customer segments are serviced by SHGs, microfinance institutions and in few cases private/public banks. These financial institutions, however, find it difficult to underwrite loans to these customers due to limited availability of banking history and lack of reliable transactions data. As a result, it is a common practice for financial institutions to limit their portfolio exposure in rural customer segments and build standardized products that do not take into account their specific needs or preferences. Intelicap will aim to address this challenge by partnering with lending/financing institutions to increase the overall access to appropriate credit for low income customers.
 3. **Record-keeping:** Record-keeping refers to improving the transaction record maintenance and financial management of rural communities, both at the household and business level. Presently, rural household and entrepreneurs maintain a rough handwritten ledger which prevents the communities, financial institutions and value chain aggregators to understand performance reliably and build a plan for the future. As a result, low income households are vulnerable to financial mismanagement and to some extent potential exploitation by intermediaries. For the pilot, Intelicap will work with digital partners and value chain aggregators to digitize household and business record-keeping. Intelicap will assist in introducing interventions such as financial training, e-receipts in local language, rural customer friendly interfaces for recording transactions in order to equip the rural customers to build a strong association with usage of digital transactions.



Value proposition for different stakeholders and value chain actors

- **Payments banks** would be able to build a strong rural customer base and minimize attrition or inactive status due to customer's affiliation with value chain aggregators (foundations/NGO's) who will be partners in the pilot due to the training imparted to these customers on digital adoption.
- **Value chain aggregators** would be able to build a strong rural customer base and minimize attrition or inactive status due to customers' affiliation with value chain aggregators (foundations/NGO's, who will be partners in the pilot due to the training imparted to these customers on digital adoption.)
- **Financial institutions** will be able to leverage the digital footprint of customers from their digital payments transactions (including income) to customize and build a credit scorecard which will enable them to underwrite customers more accurately and extend a greater access to credit as per the requirement or need of the customer. Similarly, commercial banks can partner with digital wallets to build a larger customer base without incurring the heavy costs of building branch infrastructure.
- **Behavior change agents in the local community** such as kirana store owners and milk collection agents will be able to augment their work and income streams through participating in this initiative and be incentivized by the core value chain player or the financial services firm leading the DFS adoption as a part of the pilot.
- **For the rural community**, it will lead to financial empowerment through improved cash and account management, ability to plan effectively for the future and mitigate any form of cash-based fraud risk.
- **Financial institutions and value chain aggregators** will gain from more transparent and reliable evaluation of rural enterprises and customers. This will directly contribute to tailored solutions to catalyze growth and scale.

Behavior change for adoption of DFS in local rural communities

For many of the low income rural community members, knowledge of DFS channels is very limited coupled with the inherent fear that comes from lack of understanding of transactions which corresponds to low confidence on the use of DFS channels. There is a serious need of behavior change in rural communities for better adoption and sustained use of DFS channels. Intellecap has identified the behavioral change communication (BCC) on the use and benefits of DFS at the community and household level especially with women dairy farmers and F&B entrepreneurs for pilot implementation. While many models of behavior change focus exclusively on certain dimensions of change (e.g. theories focusing mainly on social or biological influences), our proposed theory of change (ToC) would seek to include and integrate key constructs from other theories into a comprehensive ToC that can be applied to a variety of behaviors with rural community stakeholders. The proposed ToC for the pilots including its present situation, desired outcome and strategies to achieve the outcomes will be designed during the initiation of the pilot.

The ecosystem building process will be further reinforced through three critical pillars which will govern the overall journey toward adoption of digital financial services, with each pillar progressively contributing in building a sustainable digital ecosystem:

Stages to drive adoption of DFS

Easing Access

- Financial & digital literacy training
- Cash-in and cash-out options in the local area
- Offering android and feature phone-based payment solutions
- Vernacular language support
- Onboarding more technologically intelligent household members such as the eldest son or the husband

Building Confidence

- Starting with low value transactions
- Involving familiar partners and institutions in the villages (SHG's, milk society, medical bills)
- Empowering women's group leaders to drive digital payments
- Adopting an assisted model with multiple change agents to assist on a day-to-day basis (such as retail store owner, milk society secretary)

Ensuring Sustained Usage

- Digital ecosystem for household and business related expenditures
- Building sufficient commercial value proposition for partners
- Onboard other important segments such as men, children and other influencers in the villages
- Integrate a system of regular incentives and cash backs/ discounts to drive uptakes

Conclusion and limitations of this assessment

There have been a number of digitization initiatives in rural India in the past that have not met their intended objectives. The key reasons are quite obvious: high availability and circulation of cash in the economy, less developed rural ecosystem for digital spending, limited knowledge of rural users on the benefits of utilizing DFS channels and that cash is not inconvenient. A step-by-step approach on promoting digitization is likely to ensure its sustained usage that is not dependent on external stimuli such as demonetization. It should incorporate the process of behavior change and build the confidence of rural communities on DFS, ensure that the infrastructure for digital payments is available and develop multi-layered benefits of DFS for the rural customer. DFS channels have the potential to accelerate financial inclusion among women and ensure that they are more connected to the local community.

Intellecap's team has investigated on how mobile DFS can transform rural value chains that have high participation of women in India and has identified mechanisms to implement digitization recommendations through a few pilots. However, while this approach would work well for large and organized value chains such as dairy, its application for smaller and unorganized segments such as household-based cottage industries needs to be analyzed in greater detail. Moreover, the basis of the pilot and DFS solution design envisages a point of contact that is well-known and trusted by the rural women. Different ways to build the confidence of DFS transactions between a diversified set of lesser-known merchants need to be investigated. The pilot outcomes can be further strengthened by improving access to lifestyle financial products and services, as well as covering multiple income streams. A more comprehensive pilot that focuses on the total household income and expenses in its design is likely to provide deeper insights on DFS opportunities and challenges at the household level that is critical toward greater DFS adoption in rural India.

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