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REVOLUTION IN AGRICULTURAL FINANCE IN INDIA: A CONCEPTUAL FRAMEWORK

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Abstract

Purpose: For many developing Countries, agriculture sector plays an important role in their economy. In India it contributes 21 percent in GDP and near about 2/3rd of the population is dependent on it. As numerous cash transactions are carried out throughout the farm's agricultural value chain. In this paper we approach to change cash payments to digital payments in Agriculture Sector.

Research Gap: In modern scenario, Digital Finance and technology take major place instead of traditional mode of finance in every sector of economy. So there is need of revolution in agriculture sector with adopting Digital Finance and technology.

Design/methodology: This paper structurally reviews existing contributions and synthesis these into conceptual framework of Digital Finance in Agricultural Sector.

Findings: Reaching rural agricultural population and communities is challenging but Agricultural developers are well positioned to take advantage of digital finance on behalf of the pyramid's agricultural base. So, Digital Finance provides opportunity to stakeholders of agriculture sector to access high value markets and technology, and reduce cost of doing business.

Research Limitation: Drawing on our literature survey, we conclude with a conceptual framework describing the factors that affect the Digital Finance. Further research could use this framework to develop guidelines for real life applications. There are so many variables that influence our study i.e. technical literacy, service providers, digital security, cyber laws etc.

Practical Implication: It is recommended that financial service providers design brand appeals and advertising message that are targeted at farmer's functional agricultural needs. Furthermore, financial service providers can maximize superior brand experience through a successful integrated strategy of meeting agricultural functional needs in an outcome driven approach and exceeding farmer's expectation within a process-driven Digital Payments service experience.

Originality/ Values: This paper aims to advance the literature on Digital Finance from the level of individual involved in agriculture sector to a conceptual level and provides direction to how to revolutionize it through Digital Finance System. This paper broadens understanding and insight into the complex and evolving area of Digital Finance Management within agricultural financial services and has far- reaching theoretical and practical implications.

Keywords: Digital Finance System (DFS), Agriculture Revolution, Digital Payments, Digital Credit, Digital Finance Inclusion, Branchless Banking.

Paper Type: Theoretical Paper

INTRODUCTION:

For many developing Countries, agriculture sector plays an important role in their economy. In India it contributes 21 percent in GDP and near about 2/3rd of the population is dependent on it. As numerous cash transactions are carried out throughout the farm's agricultural value chain. In this paper we approach to change cash payments to digital payments in Agriculture Sector.

Digital technology impacts the business case, operating model, product design, and distribution methods for financial services offering greater accessibility, affordability, and more tailored products that meet the distinct needs and capabilities of rural customer. Innovations such as satellite, data analytics impact the way agricultural activities take place along the value chain. Among these range of digital financial services play an important role. Today digital financing is affecting the cost and ease of service provision to rural areas. Where serving rural markets may have been cost prohibitive, risky and inconvenient so now these institutions have an opportunity to re-examine this sector with the use of digital finance. Digital Financial services are expanding with the time around the world. Mobile insurance, credit and saving have all experienced growth in recent past; globally there are120 mobile insurance products in 33 emerging markets and 90 percent of the customers can apply for loans directly from their phones. Recent days digital financing is being experimented but still farmers and SME agro businesses is untapped market. So, now banks and other financial service providers now see an opportunity to serve these markets. When talking about farmers the ones who are operating on the land of less than one hectare usually faces challenge of limited supply of financial services like credit, savings, and insurance. As agriculture plays an important role in the economic development of a country but still financial services are not well introduced or still untapped in agriculture sector so, by developing well communication and distribution mechanism the relationship between such providers and farmers can be improved. The basic element of DFS product remains the same in agriculture as traditional, but the only difference is that now these services are accessible to rural customers via digital technology like on phones or on other digital platforms. Today there has been reduction in brick and motor services networks because now technology is reaching to door steps of rural consumer as technology providers and MNO are communicating with financial institutions, agribusinesses, cooperatives and non-governmental organizations. So, these partnerships indicate that DFS offerings can find valuable in agriculture sector. Digital financial service is amplifying around the world. In 2017, there were 276 mobile money deployments in 90 countries, around 20 percent of which include saving, investment or pension products, globally there are 120 mobile insurance products in 33 emerging markets and 90 percent of mobile consumers can apply loans directly from their phones. While there has been experimentation in DFS in agriculture but still various farmers and SME agri businesses are most untapped markets. As a result, a range of financial service providers are continuing to invest in rural areas through their digital channels.

Agri-value chain actors and drivers of DFS needs:

The actors commonly found in the chain that shape the DFS needs are usually animal husbandry, the provision of agri inputs and the trading and distribution of outputs. There are also drivers that influence the specific DFS needs i.e. are revenue generation, transaction relationship, formal financial services usage, digital technology.

a) **Revenue generation:** It provides information regarding types, sources and pattern of revenue generated. It impacts DFS needs which are related to willingness and potential to pay for products such as savings, credit, lending and potential terms and conditions. (interest rate, repayment schedules)
b) **Transaction Relationship:** this driver takes in to account the payment methods and impacts DFS needs about product parameter and its use such as trimming, velocity and volumes of payments and transfers.
c) **Formal Financial Services Usage**: It is related to account ownership and types of product used namely savings, credit, lending or insurance with issues of awareness and facility such as proximity to branch network, applicable fees, familiarity with other alternative channels like ATM, online, mobile banking. It also impacts DFS needs regarding the types of products.
d) **Digital Technology**: It includes the types, sources and trends of accessing information and relationship of digital technology with process of sourcing information. It influences the DFS needs which are related to service distribution and product design and the overall users experience with several digital components.

Emerging Approaches Regarding digital value chain finance: Due to revolution in technological environment, various number of initiatives are increasing. These initiatives are putting impact on value chain finance related to agriculture. Although digital value chain finance (DVCF) is in its emerging stage, there are clear trends of digital tools integration in value chain finance. Specially there are three major cases where these tools are used in small farmer's value chain finance.

1. Improving the efficiency of financial transactions.
2. Decreasing barriers to providing financial services.
3. Improving market opportunities.

Background of Agriculture Financing in India:

Till 1935 money lenders were only major credit providers to farmers. These money lenders used to charge high interest rates with strict terms and conditions. Due to this, farmers were heavily burdened with debts and many of them sacrificed their life and land. As a result, various acts were passed like Reserve Bank of India Act 1934, District Central Cooperative Banks Act and Land Development Bank Act. So, with the incorporation of these acts agriculture credit was improved, also powerful agencies were established which provides credit at reasonable rates with reasonable terms and conditions. Consequently, bank credits in agriculture was improved and various bank branches were opened in rural areas and bank deposits were attracted.

Earlier cooperative banks were the only player in the market who used to provide agriculture credit but after nationalization of 14 major banks it was made compulsory to these banks to provide agriculture finance to farmers as a priority sector. These banks provide agriculture finance in large scale through branch expansion programs. Development and adoption of new technologies and availability of financial service works simultaneously. Short and long term needs of credit of farmers was fulfilled by various formal institutions like cooperative bank, Regional Rural Banks, Scheduled Commercial Banks, Non-banking financial institutions and Self-Help Groups. The share of short term agriculture credit in total agriculture credit is going up. Other new credit delivery system is also developed e.g. Kisan Credit Card to provide easy access to credit. From 2001 to 2012 agriculture credit has increased rapidly, especially after the '**doubling period'** (2004-07), showing almost a 10-fold increase. Around Rs 28 lakh crore have been dispersed during the 12 year.

India Scenario:

As far as we talk about India According to **"Situation Assessment of Indian Farmers" 2017**, only about 28% of all farmers use any kind of agriculture-related information that is available rather than *what they need*. While about 72% of farmers do not have any source of information that can help them adopt latest technology, most farmers are unable to access credit, insurance and marketing services from the established institutions. This is primarily responsible for farmer's low crop productivity and profitability. Despite India has the largest irrigated land and ranks second in terms of arable land the yield crops are 20%-40% of the world's best levels. in terms of raising crop productivity and profitability per unit area and resources. By June, 2014, rural India had about 122.4 million [68.32%] households with mobiles exhibiting mobile connectivity has become a basic service in rural areas. Rural mobile subscriber base is growing twice as faster compared to urban subscriber base. As of March 2015, the national teledensity was 79% and rural teledensity 46.5%. Telecom Policy aims to increase rural teledensity to 60% by 2017 and 100% by 2020. Study of the IAMAI revealed 80% using it for communications, 67% for online services, 65% for e-commerce and 60% for social networking. Mobile phones can be effectively utilized for purposes including generating, processing, transmitting, disseminating, sorting, archiving and retrieving critical information and data relating to agriculture. Mobile phones are omnipresent and cost effective means to revolutionize agriculture in India. Several apps are now available and many more can be developed to meet farmers' following specific needs. NABARD and private sector in developing farmers-friendly portals as an integral part of digital India project to accelerate farm productivity, production and profitability.

Harnessing potential of ICT, a must:

Information and communication technology has ability to revolutionize the Indian rural agriculture farming. Several Apps has been launched like agri market, crop insurance, uzhavan etc. and many more can be developed so that finance can be easily available to the farmers. To boost this Indian Government has launched Digital India programme which focuses on three main elements i.e. digital infrastructure, digital services and digital literacy. Mobile phones are the preferred medium under digital India campaign. Government has also launched dedicated payment banks, supported by digital platform and mobile operators. Private sector is also taking initiative and developed e-Choupal that provides internet access to farmers, e-Choupal not only connects farmers with markets but also allow integration of supply chain ITC has also partnered with banks to offer farmers access to credit, insurance and other services.

METHODOLOGY:

This paper structurally reviews existing contributions and conceptually synthesis these into conceptual framework of Digital Finance in Agricultural Sector. Researcher has studied various papers and books and taken data from various online website and concluded his research. In our review we focused on contribution of digital finance in agriculture. It was really a challenge to find papers on impact of digital finance on agriculture so to address this challenge, a broad structured literature review was conducted. We also used combination of keywords in a single sentence to find potentially relevant papers.

The paper is based on the secondary data and compiled from diverse sources like Agriculture statistics at a glance (2008), by the department of Agriculture and cooperation, Ministry of Agriculture, Government of India, reports on currency and finance, published by RBI and various annual reports of National Bank for Agriculture and Rural Development (NABARD).

Data Analysis:

- **Innovation in data availability, analysis and utility for market intelligence and risk evaluation will drive the path of DFS offering for agriculture:** For the success of DFS digital devices and delivery channels are most important that is why its coverage is being widely increasing in developing countries. Tools like mobile connectivity will make sure that products and services and information regarding credit can be easily accessible. DFS offering in agriculture need to take full advantage of present technology and digital solutions to penetrate the market and provide services with change in trend.
- **The utility of the services, and the ability of technology solutions, analytic methods and operational processes that power them will be tested at scale:** More data will become available at lower costs, and more players will engage in new ways of analysing it. From these new improvements new products will be developed and current services and can be improved, leading to better understanding and targeting the rural customers. So, advancement in data availability and better analysis will drive the innovations.
- **Long term winners in the space of DFS and agriculture will be in partnership:** While Various private banks in the past have preferred to build their own technology, serving the agriculture sector but growing opportunity in agriculture sector will require partnerships to be commercially viable. Single service provider adds value to DFS but they cannot become leaders that will be able to provide services at commercially viable prices.
- **Without investment, agriculture will not meet the needs of growing populations:** Agriculture acts as a foundation for a developing economy, they are the driver of nutrition, food security and critical to mitigating climate change. So without more strategic investment, it will not be able to succeed in its critical role. While governments and international stakeholders have crucial roles to play in agriculture productivity but with that private sector and especially financial service providers are important. Without the introduction of capital and investment in financial services for agriculture sector, it will continue to underperform.
- **Elements related to moving forward about agri-related E-Commerce:** E-Commerce in agriculture is an emerging phenomenon, there are not yet many longstanding implementations from which best practices can be obtained. Now, farmers have mobile devices and E-commerce requires much more than digital communication. Online platform provide facility related to agricultural transaction by providing convenient supply chain logistics. E-Commerce is much easier in urban areas as compare and degree to which it can serve last mile farmers will be determined by how successfully the payments and logistic are executed. So, for the success of E-Commerce value chain in agriculture is required to be more efficient.

- **Applying Digital Solutions**: Digital data management helps reduce the risk of farmers at their work by providing customized software on their phone and tablets. Digital data management helps in gathering and analysing data during on- farm activities and in post-harvest storage, processing and transport.
- **Moving forward digital SME payment in agriculture:** Likewise, with advanced credit for smallholders, buyer assurance for digital SME loaning should be cemented to guarantee that the multiplication of accessible items doesn't bring about wide-scale over-obligation. This is especially evident given the huge capital streams in this segment and the extension of various loaning models. As recently supported fintechs and different elements access SME business information, information security guidelines must keep pace with the pace of progress. Loaning to this portion can likewise positively affect other agrivalue chain on-screen characters. Money gave to an agribusiness SME, for instance, can thus reserve sources of info and working capital for farmers in the event that they are legally connected to that venture in an out grower plot
- **The Relevance of Agri-Value Chain Structure on Profiles and Concentrations of Customer Demand:** When applying an all-encompassing, esteem chain way to deal with DFS offering plan and evaluation in horticulture, suppliers ought to consider the chain's general structure and level of association. Taking a gander at agri-esteem chains along these lines, particularly less composed chains underserved by conventional money related contributions, suppliers can all the more likely figure out where potential client focus will probably be most noteworthy.
- **Application of Digital Solutions**: Digital payments address the wasteful aspects of money by lessening the time and cost of making a trip to execute, expanding the speed at which payments land to their expected beneficiary, cutting the danger of burglary and extortion related with conveying money on long voyages, expanding the simplicity and straightforwardness of bookkeeping, and giving a point of section to more extensive budgetary administrations for already underserved farmers. 59 per cent of the 235 million unbanked grown-ups overall who "get money payments for the closeout of rural items" have a mobile phone, the essential prerequisite for versatile cash enlistment, giving a feeling of the potential for this methodology to scale. While advanced agrarian payments are a long way from a panacea for the budgetary access difficulties smallholder farmers face, they can drive a digital appropriation arrange from which further use cases may extend rustic utilization of mobile cash. Using a digital payments item, farmers not just get remuneration for their gather or domesticated animals exchange yet can likewise make extra payments for merchandise and ventures without breaking a sweat and productivity, for example, inputs, development materials, family unit things, and new models of portion payments for sustainable power source items, for example, sunlight based lighting and siphon water system. Advanced payments can likewise fortify worth chain connections; by carefully paying farmers,

agribusinesses manufacture individual profiles of farmers in their systems. Digital horticultural instalment exchange records might be the primary budgetary history such farmers have, and agribusinesses may layer over this data other information from the farmers' plots and creation to fabricate an increasingly thorough profile. Through these records farmers may end up qualified for extra carefully conveyed items, for example, credit and protection.

- **Improving the efficiency of financial transactions**: Money related exchanges coursing through horticultural worth chains, for example, payments to and from farmers, dealers, processors, or exporters for products and enterprises or credit payment and reimbursements, remain overwhelmingly money based. The way toward dealing with, conveying, and gathering money in country regions is both moderate and costly; it is likewise liable to dangers, for example, burglary and misfortune. Digital payments that influence administrations like versatile cash guarantee to decrease the expenses and dangers engaged with money based exchanges, while likewise creating an information trail on incomes that can be utilized to evaluate credit hazard. Ways to deal with digitizing payments along value chains incorporate two winning item applications: digital mass payments to providers, and advanced credit payment and reimbursements.
- **Digital bulk payments:** According to GSMA, in 2016 there was an estimated US$316 billion in cash payments from agricultural buyers that could have been shifted to digital channels—mobile money in particular. By 2020 this amount is expected to grow to US$394 billion (GSMA 2016). Digitizing mass payments gives noteworthy advantages to smallholders too by enabling them to get their assets quicker and all the more safely. Farmers frequently need to sit tight weeks for their payments or they need to make a trip far to get them, contributing essentially to the exchange costs they face. With advanced payments administrations, farmers can choose when and where to money out their assets; this keeps the potential danger of burglary from individuals who may discover when farmers are getting paid. Furthermore, when farmers get payments carefully, they have the choice to securely put aside a portion of those assets as a parity in their versatile wallet or connected bank account. All things considered, without a sufficient framework and a broad operator organize, moving from money to advanced payments requires a generous forthright venture and can bring about an extra weight on smallholders. On the off chance that there are no specialists close by or operators don't have the liquidity to lead money/in real money out exchanges, farmers probably won't have the option to get their payments on an opportune premise. This issue was featured in a CGAP supported pilot in Uganda, where sugar and espresso Farmers who were accepting versatile payments said that they needed to hold up an unsure measure of time to get their payments if specialists didn't have sufficient liquidity. The pilot experience additionally featured that farmers' benefits are undermined if the exchange charge they need

to pay to money out is more than the immediate and circuitous expenses of accepting money payments (Lonie and Makin 2016).

- **Digital loan disbursements and repayments:** Similarly, as in mass payments, digital disbursement and repayment of credits can bring about cost investment funds and assisted procedures for both the FSP and the customer. In acknowledgment of these points of interest, FSPs are progressively depending on digital instruments for loan related exchanges. Similarly, as with other mobile money transactions, farmers can profit by the wellbeing and comfort of digital. For instance, for loan clients who might somehow or another need to go to a branch, making or accepting payments by means of mobile money time and money saving. Be that as it may, digital disbursement and repayment of loans faces many issues same as bulk payments via mobile money. A lacking operator arrange and inadequate accessible agents. float or liquidity can upset farmers' capacity to make reimbursements or withdraw payment, which thus could bring about misconduct or a deferral in getting to their loan funds.
- **Digital Agricultural Insurance:** Agricultural insurance products are to a great extent inaccessible to smallholder farmers on account of the significant expenses of checking loss claims in geographically dispersed zones, the generally little size of individual approaches that smallholders require, and the restricted understanding of agricultural risks with respect to insurance providers. therefore, few providers have been happy to offer agricultural insurance policies that address the issues of smallholders. Digital technology can address a portion of the particular difficulties of offering agricultural insurance to smallholders by improving actuarial estimations and reducing the cost of delivering and monitoring insurance products. In the case of weather-index insurance, for example, registration by mobile phone allows customers to be geotagged, which when combined with automated weather stations and satellite imaging means that insurance providers do not have to conduct in-field loss assessments nor collect premiums or make pay-outs in person.
- **Digital Credit:** Generally, FSPs have battled to offer credit products to smallholders as a result of the expense of serving remote regions and the absence of records of loan repayment or guarantee. In any case, progresses in information examination and mobile technology are creating cheerful signs that FSPs may before long have the option to defeat these obstructions. However, digitization of the application procedure, while valuable to trustworthy smallholders doesn't address problems in the examination utilized by the FSP to decide financial soundness, which decides if the customer qualifies for credit in the first place. In spite of the guarantee of digital credit for smallholders, there are additionally a few difficulties. These incorporate the high starting speculation required to create and test calculations, particularly in light of provider’s hesitance to serve another customer segment, like smallholders (RAFLL 2016). Industry players are additionally raising worries about the possession and security of client information. In numerous nations, regulatory frameworks have not caught up with innovations in the digital space. Any endeavours to create digital

credit items for interests in sources of information or working capital should be customized to the agrarian cycle.

FINDINGS:

- Innovation in data availability, analysis and utility for market intelligence and risk evaluation will drive the path of DFS offering for agriculture.
- The utility of the services and the ability of technology solutions, analytic methods and operational processes that power them will be tested at scale.
- Long term winners in the space of DFS and agriculture will be in partnership.
- Without investment, agriculture will not meet the needs of growing populations.
- The agriculture credit expending to SF/MF increased 1.54 lakh crores from 2015 to 2017.
- The number of SF/MF accounts increase 2.31 crores during the period between 2015 to 2017. Researcher concluded that there has been decline in the non-institutionalized agricultural credit from 90.9 percent to 20.9 percent in last few years.
- It was also found that highest increase in loans issued by Scheduled Commercial Banks with CGR of 32.05 and lowest was in Cooperative Banks with CGR of 13.57 percent regarding short term credit in agriculture.
- Where as in case of long term finance highest loan outstanding were in case of Scheduled Commercial Banks with CGR of 22.74 while it was lowest in Cooperative Banks of CGR -2.81 percent.

CONCLUSION:

While mobile money and agent banking have disrupted and transformed the financial sector in whole world. Over the past ten years with extraordinary impact on financial inclusion, rural households and smallholder farmers remain relatively untouched by these developments to date. DFS offerings can effectively cater to a wide range of actors across agriSS-value chains from smallholder subsistence farmers to international commodity traders. Reaching rural populations and communities remain challenging for myriad reasons. But with new technological advances and a more mature DFS industry with a range of actors, it is increasingly possible to sustainably reach these traditionally excluded market segments. When surveying the DFS offering landscape in agriculture, two important trends emerges: bundled services and partnerships. Different approaches to serving rural customer segments at the retail, enterprise, or even corporate level are justified as a number of models and offerings have progressed in a range of markets over the last decade that warrant closer attention. These models emphasize developing a more nuanced understanding of customer needs, patterns, preferences, and perceptions – specifically as they relate to farmers. When providers more effectively target the problems of this segment, their offerings will also address the problems of other rural customer segments adjacent to or above them. This approach also enables providers to invest in offerings with a compelling value proposition for a much larger percentage of a market for financial services that is sizeable but largely unsaturated.

With the assurance of digital system tools is agricultural value chain finance is visible in the various areas such as savings, credit, insurance and other payment products that had little involvement earlier in agriculture finance. Key consideration to move forward in digital finance is better quality mobile networks and proper infrastructure in rural areas. So, for that MNO's has to make huge investment to operate in rural areas as well as the payment agents has to work in partnership with these mobile operators to ensure that customer in rural areas can cash in/ out on demand. Since investment in agents and networks cannot be made without a convincing business case, actors along the value chain should drive and expand volume of digital exchange that help to justify costly investment in infrastructure. One approach to complete this objective is to upgrade the offer of advance instalment by developing the broader eco system surrounding mobile payments, including availability of merchants and other service providers that accept mobile payments. Moreover, payment providers should revisit their fees structure so to increase and encourage the digital payments.

Partnerships with value chain actors like farmers, traders, off-takers, manufacturers and agricultural agents can help financial service providers in achieving their objectives in rural areas as these actors acts as entry point for the integration of digital finance with the complex value chain in agricultural sector. But working with these actors is not an easy task for the financial service providers as actors need to be first sensitized regarding quality and reliability of the data.

Now, many digital offering services are facilitating farmers who already had strong connection with agriculture value chain actors, a number of digital services are targeting farmers with weak connection to value chain and making effort to increase their potential and productivity. But in future there is chance to shift small holder farmers to these services and participate in development of agricultural value chain with their growth in income and in that digital financial system can play major role in it. Innovation in finance to solve the needs of the rural sector should not be limited to financial institutions. The government can play a proactive role by promoting laws and regulations with new financial instruments or even raising awareness of existing ones to bring them to the attention of the financial and agricultural sectors.

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