Research Journal of Finance and Accounting
ISSN 2222-1697 (Paper) ISSN 2222-2847 (Online)
Vol.6, No.7, 2015

Agricultural Finance Constraints and Innovative Models Experience for Ethiopia: Emprical Evidance from Developing Countries

Aderaw Gashayie[1*] Dr Manjit Singh[2]
1.PhD Research Fellow, School of Applied Management Studies, Punjabi University, Patiala, India
2.Professor of Accounting and Finance, School of Applied Management Studies, Punjabi University,Patiala, India

Abstract
Efficient agriculture, agro-processing industries, and related distribution and logistics chains are essential elements of human development. In most developing countries, agriculture and agricultural value chains are inefficient and unproductive. Production yields fall short of potential, and products are spoiled during storage and transport. Crops regularly fail for various reasons, even though risk management and mitigation strategies exist. Lack of finance is one of the reasons why agricultural productivity in developing countries and Ethiopia in particular is very low. Recent studies confirm that the lack of agricultural finance is as pressing as ever. In spite of government programmes undertaken over the years, supply and demand for financial services continue to be mismatched, both in terms of the types and the volume of services. Government policies have not been able to remedy these shortcomings. Nevertheless, recent innovations in agricultural finance have created renewed interest in the sector. Such innovations include value chain finance approaches involving traders and processors, warehouse receipt finance, agricultural (index) insurance, (rural) microfinance, just to name a few. Building on these positive developments, this study will attempt to contribute ideas based on recent experiences with innovation from developing countries in order to spur more innovations in rural finance. Thus, this study aimed to identify constraints that keep the financial sector from serving agriculture effectively and agricultural finance innovations to mitigate these constraints.
Keywords: agricultural finance, constraints and innovative models, empirical evidence

1. Introduction

Everywhere in the world, small agricultural producers are entrepreneurs, traders, investors, and consumers, all rolled into one. In all these roles, small agricultural households constantly seek to use available financial instruments to improve their productivity and secure the best possible consumption and investment choices for their families. But access to finance remains a major challenge for smallholder farmers in most developing countries like Ethiopia. The problem often is seen in terms of limited access to production credit to buy and use farm inputs as well as pay for non-family farm labour and other farm maintenance costs. Because smallholder farmers cannot afford yield-enhancing inputs, farm productivity often remains low on smallholder farms despite available technology for achieving higher yields. However, smallholder farmers also face major difficulty in accessing post-harvest credit, leading to severe household liquidity constraints which often compel them to sell the bulk of their produce at harvest when prices are extremely low. Financial constraints also prevent them to condition produce to meet quality requirements in premium markets. This way they miss out on opportunities for higher household income. Furthermore, smallholders have limited access to formal savings facilities because there are few financial institutions that provide such services in rural communities.

Consequently, smallholders tend to hold their wealth in non-liquid assets (e.g. livestock and household goods), risking loss through theft, fire or other perils. Insurance and price hedging instruments are almost non-existent because markets for these are missing or severely under-developed. To fill this gap, this study reviews financial constraints and agricultural finance innovative models in the rural/agricultural sector. It focuses particularly on sustainable models that are embedded in enduring transaction-based relations in agricultural value chains. The remaining part of this study is organized as follows. Section 2 provides overview of agriculture finance and its stages. Section 3 analyses the factors that constrain agricultural finance. The study goes on to describe and analyze the recent innovations in agricultural finance that have been shown to (partially) overcome such constraints in section 4. This study closes with Lessons learned in Section 5.

2. Overview of agriculture finance and its evolution

The rural poor – over 800 million people in the world require and use a variety of financial services. However, in most cases these services are inappropriate and provided on usury terms and not on conditions that are conducive to rural poverty reduction. In the 1980s and 1990s the deleterious impact of limited financial access caught the attention of many academics, policymakers, donor agencies, and development practitioners, who generated an outpouring of new thinking and new ideas. Innovative concepts such as group liability, village banking, micro

insurance, and index-based insurance were tested in new and emerging microfinance institutions. But progress on expanding agricultural finance—as opposed to nonagricultural microenterprise finance—lagged. Donors and governments that had invested heavily in agricultural development banks and agricultural credit in the 1980s and early 1990s found that these efforts did not produce the expected results and withdrew their support. It was hoped that private commercial banks would step in, but for the most part they did not. Financial institutions have demonstrated a lack of interest in agriculture finance. This is supported by many researchers (Chalmers, 2005; Wampfler and Lapenu, 2002; Zeller, 2003).

In sum, agricultural finance markets are wrought with high transaction costs and risks that hinder the development of financial services. To create agricultural financial access for smallholder farmers by mitigating these constraints it has evolved from agricultural credit era (1950 - 1985) to donor microfinance era (1980 - 2000)to commercialization of MFIs (2000 to present) to value chain finance (2005 to present).

3. Constraints of agricultural finance

Different theoretical and empirical literatures identify different classification of Constraints of agricultural finance as indicated below. The basic difference emanates from academicians' educational back ground and country context.

Jessop et al (2012) conducted a study in six countries (Cambodia, Mali, Senegal, Tanzania, Thailand and Tunisia) entitled on Creating Access to Agricultural Finance and identified the following constraints of agricultural finance: high delivery cost, proximity ;weak farming practices and farmers ;lack of banking technology; lack Collateral ;exogenous risks; Government intervention; weak collaboration among farmers.

Temu (2009) conducted a study entitled "Innovations in Addressing Rural Finance Challenges in Africa" and identified the following constraints: high transactions costs(inaccessibility of rural areas and physical access challenges, asymmetric information, underdeveloped infrastructure compounding the challenge of inaccessibility);low income cash flows and capital bases(lack of collateral, social cultural barriers, demand for small volumes savings, demand for small loan sizes),highly risky commodity and financial markets(financial transactions risks, agricultural commodity production and markets risks).

Miller(2008) identified 12 agricultural finance constraints under four headings as **Vulnerability Constraints** (Systemic risk, Market risk, Credit / financial risks) , **Operational Constraints** (Low investment returns, Low investment and asset levels, Low geographical dispersions, **Capacity Constraints**,(Infrastructural capacity, Technical capacity and training, Social exclusion, Institutional competency) and **Political and Regulatory Constraints** (Political and social interference, and Regulatory framework).

According to Langenbucher(2005)the Specific causes of financial exclusion for the small farmer is categorized as demand-side and supply-side indicated below:

Demand-side	Supply-side
• Small sizes and unregistered formats, very little documentation, accounts not properly audited, incomes are suppressed to evade tax and a general state of records that will not give bankers the comfort to lend;	• High covariant risk correlation, when lending to farms: all borrowers are affected by the same risks, such as low market prices and reduced yield due to weather;
• Weak organizational capacity, geographical isolation and lack of basic business skills, human resource management, and marketing for agro-based enterprises;	• Underdeveloped communication and transportation infrastructure;
• Complexity of businesses – agro-based MSMEs are complex to assess and appraise as they fall out of the pack of traditional businesses financed by banks;	• Small size average farm, low population density, higher loan servicing costs due to limited volumes and high information costs;
• Stagnating productivity, decline in cropping intensity and yield; Fragmented base of producers;	• High cost of credit coupled with lack of collateral and collateral substitutes;
• Disguised unemployment and low labor productivity;	• Lack of technical knowledge at the bank level to evaluate and analyze the creditworthiness;
• Lack of irrigation potential;	• No specialized product offered by the financial intermediaries to better meet the financing need of the agricultural sector;
• Inadequacy of post-harvest management practices leading to wastage of commodity;	• Lack of a robust business model, flexible products and delivery processes which support agro-based enterprise financing;
• Lack of considerable investment in infrastructure;	• Agriculture perceived as low-margin business by financiers;
• Inadequate integration of VC;	• Lack of availability of products that meet the needs of appropriate, adequate and timely credit; limited access to equity capital – venture financing in traditional agro-based MSMEs industries is non-existent and availability of risk capital is very difficult despite a plethora of government-supported schemes;
• Insufficient cash flow information and poor recordkeeping by producer and poor financial management;	• Lack of appropriate risk-mitigation measures and mechanisms;
• Seasonality in businesses leading to suitability of non-standard and irregular repayment schedules;	Lack of infrastructure such as bank branches at the 'last-mile';
• Lack of collateral due to lack of or poor quality of farm assets and non-enforceability of security due to lack of land and property rights;	• No branches or limited network in rural areas;
• Volatility in prices of commodities and poor market opportunities for crops;	High transaction costs due to wide client dispersion and less developed infrastructure.
• Inadequate or lack of access to extension, seed, irrigation, fertilizer, etc.;	
• Inability of clients to prepare viable project proposals;	

Based on the literature reviewed and my observation in the rural area the following model is developed that contains summary of agricultural finance constraints and specific issues:

1. Vulnerability constraints 1. Systemic risk 2. Market risk 3. Credit / financial risks	ISSUES ✓ Weather ✓ Plagues, diseases ✓ Prices ✓ Production ✓ Useable collateral ✓ Demand preferences ✓ Health & family needs
2. Operational constraints due to 4. Low investment returns 5. Low investment and asset levels 6. Low geographical dispersions	ISSUES ✓ Low growth potential ✓ Low velocity of capital ✓ Non-competitive technologies ✓ Lack of market integration ✓ Lack or quality of roads and communication ✓ Low efficiencies of business operations ✓ High operating costs
3. Capacity constraints including 7. Infrastructural capacity 8. Technical capacity and training 9. Social exclusion 10. Institutional competency	ISSUES ✓ Lack of business investment ✓ Lack of competitive technologies ✓ Lack of roads ✓ Lack of communication ✓ Lack of education ✓ Lack of technical and management skills ✓ Lack of institutional capacity ✓ Lack of social representation (civil society)
4. Political and regulatory constraints 11. Political and social interference 12. Regulatory framework	ISSUES ✓ Political interference ✓ NGO “donation” interference ✓ Cultural and gender constraints ✓ Land tenure laws ✓ Financial regulations ✓ Tax policy

To address the issue of agricultural finance constraints raised above reviewing recent agricultural finance innovations in developing country is done next.

4. Innovations in Agricultural Finance

Conventionally, an innovation is associated to a new product and service that a set of customers value and will pay for (Bessant and Tidd 2007). However, today, innovation is permeating all spheres of life. It is difficult to find a company, an organization or an institution which does not have innovation on the agenda. Reflecting this, we will work with a definition of innovation encompassing innovation of product and services, innovation of processes such as evolutional, organizational, managerial and institutional processes which Hotho and Champion (2011) refer to as soft innovations.

The past 10 years have seen numerous innovative models to improve the provision of agricultural finance, for smallholder farmers in particular. Many of these innovations show great promise in strengthening agricultural and hence rural livelihoods, although none is a “universally” applicable cure. Great progress was recently made in reaching out to smallholder farmers through a variety of financial services. In truth, most “innovations” are not new, and some date back decades, centuries or even millennia. What is new, however, is agricultural financing in new situations and for farmer types that were un-bankable before – smallholder farmers in particular. Such innovations tend to combine several financing concepts, and are nearly always embedded in value chain development. Miller (2011) notes that “agricultural value chain finance is an approach to financing. The major financial innovations and the key factors of success for their implementation are discussed next. These innovations tackle specific constraints in agricultural finance and reduce lending risks.

1. Localized finance

In the context of agricultural finance, the importance of localized finance is its proximity to rural communities. Whereas in the 1960s and 1970s large (agricultural) development banks were created with a top-down approach to rural finance, in the past two decades the emphasis has been on the creation of rural and village banks, credit

cooperatives/unions, self-help groups, and NGO-type microfinance institutions in many forms and shapes. Many are user-owned and managed, but nearly always regulated at the national level through an APEX body. Microfinance institutions, local savings and credit associations and rural (micro) banks are currently the most credible financial service providers to smallholder farmers in remote areas.

Community-based financial organizations (CBFOs) are user-owned, user-operated intermediaries. Though some are informal – as they are not registered – many can be described as semi-formal because they are registered as associations which offer financial services but are not regulated. Examples include Rotating Savings and Credit Associations (ROSCAs) and Savings and Credit Cooperatives. CBFOs usually offer savings and credit facilities to members. They have several comparative advantages over formal financial intermediaries. Their lack of capital requirements and prudential banking regulations imply that CBFOs are relatively easy to set up and can enjoy considerable operational flexibility. Their operating procedures are rather simple and suited to the needs of a population that may be largely illiterate. Because they have intimate knowledge of their clients (members) CBFOs significantly reduce information asymmetry problems. However, principally because they are unregulated, they are not able to mobilize resources from non-members, thus limiting their intermediation capacity. Uninsured farm risks also restrict delivery of farm credit and/or may adversely affect the quality of their assets, leading to solvency crisis, especially where enforcement of banking regulations is lax.

Innovations to address these challenges include linking community-based banks to other financial institutions; and setting up quasi-regulatory structures dedicated to these banks. They can also improve their business prospects by extending the range of services they provide to include farm extension and agricultural insurance (retailing appropriate insurance products on behalf of mainstream insurance companies, thereby improving the risk profile of their clients.

2. Agricultural leasing

Leasing is a contract between two parties, where the party that owns an asset (the lessor) lets the other party (the lessee) uses the asset for a predetermined time in exchange for periodic payments. Leasing separates use of an asset from ownership of that asset. There are two main categories of leasing: financial leases and operating leases. In a financial lease, lease payments amortize the price of the asset. At the end of the lease period, the lessee can purchase the asset for a token price. The lessee is responsible for maintenance and risk of obsolescence of the asset. Because of the option to purchase the asset and the risks transferred to the lessee, a financial lease is a close substitute for a loan. Nearly all rural leases are financial leases. In contrast, operating leases do not include the option to purchase the asset. Maintenance costs and risk of obsolescence are borne by the lessor, and leases are cancelable.

Leasing as compared to traditional credit requires no collateral or less collateral than typically required by loans, lower down payments than the equity required for loans and are more affordable for rural enterprises that have limited funds and little access to borrowed funds.

Although the difficulties involved in creating, perfecting, and enforcing security are applicable in both urban and rural contexts in most developing countries, they are more severe in rural areas where enterprises are less likely to hold titles to their assets, asset registries are less likely to be functional, and judicial processes are likely to be slower. Lessor's are also likely to benefit from not being restricted by interest rate ceilings and sector-specific credit allocations—factors that have traditionally constrained rural lenders.

In Kazakhstan, agricultural leasing has been practiced for more than a decade, typically for long-life farm equipment. These financial leases are promoted by banks' special leasing departments in collaboration with the equipment suppliers, who offer the equipment at a discount. The literature (Nair, 2010*;* Schrieken, 2007; KIT/IIRR, 2010) provides examples of profitable agricultural leasing in Ethiopia, Kenya, Mexico, Pakistan and Uganda. MFIs (micro-) lease such items as water pumps, dairy equipment and tools for honey production.

3. Value chain intermediation

The literature (Campaigne *et al*. 2010; World Bank, 2005) presents a special type of value chain finance where an intermediary, which is not itself a value chain partner, facilitates the process for all parties. DrumNet Kenya has developed a technology platform allowing it to act as an intermediary between finance providers, farmers, input suppliers, and buyers. It combines elements of value chain finance and microfinance.

This is essentially contract financing, but with the innovation that an independent party sits in the middle, and manages the process through a master contract. The fact that farmers receive their loans in kind and that the loan repayment is withheld from harvest receipts reduces risk to the bank. Transaction costs are reduced via Drumnet, which aggregates financing, technical advice, input supply and marketing. Risk is also reduced due to technical advice and access to premium markets. Nevertheless, DrumNet has faced the usual business risks, such as partner non-compliance (including banks) and harvest failure, which make loan repayment impossible. Similar experiences are also found in Latin America. Intermediation is useful when farmers (and their representatives) have insufficient capacity to take on traders and finance providers.

4. Agricultural factoring

Agricultural Factoring is a financial transaction, in which a business sells its accounts receivable (i.e. invoices) at a discount. Factoring differs from bank loans in three main ways. First, the emphasis is on the value of the receivables, not the firm's creditworthiness. Secondly, factoring is not a loan – it is the purchase of an asset (the receivables). Finally, a traditional bank loan involves two parties, whereas factoring involves three. Three parties directly involved in a factoring transaction are: the *seller*, the *debtor*, and the *factor* (the specialized financial company). The *seller* (e.g. input supplier or wholesaler) is owed money (usually for products or goods sold) by the buyer of goods, the *debtor*. The *seller* sells its receivable invoices at a discount to the third party, the *factor*, to obtain an advance payment (e.g. 75–85 per cent).

An innovative financial model which involves agricultural factoring (KIT/IIRR, 2010) is found in Kenya. Invoice discounting and factoring are completely normal financial services in developed markets. However, such services are unusual in developing countries and in agriculture in particular. Kenyan smallholder tea farmers found that it took them a long time to be paid for their tea, which was because the processors and exporters were in turn kept waiting by their international clients. Farmers were often forced to sell tea to local traders at unfavorable prices to get quick cash.

5. Extension services and financial literacy

The generally low level of education and technical know-how of farmers is one of the main reasons why banks decline to finance agriculture. Farmers and smallholders in particular, generate little cash, and even when they do, they may not be able to provide the documentation to convince bankers that this is so. Research undertaken in Moldova (EFSE, 2010) found a strong correlation between farm performance (increase in production and profits) and the use of extension services provided by the regional branches of the Ministry of Agriculture. Naturally, the farms' repayment capacity will have increased as well. In recognition of this finding, some banks in Moldova oblige their agricultural clients to seek government-subsidised extension services. Research in India (Mahajan, 2010) found that credit to poor farmers has little impact on their income, hence levels of poverty. However, when combined with extension services and input supply for productivity enhancement, risk mitigation (through insurance), education and market development, the results were much better. It was found that farmers are willing to pay for these services. Farmers preferred cost-saving and risk-reducing solutions over yield-enhancing technology that requires investment.

The literature also shows that financial education can play an important role in better preparing farmers for their interaction with finance providers (Cohen, 2010; IFAD, 2009). Farmers find it hard to provide financial institutions with the financial information required to assess the farmers' loan repayment capacity and risk. Likewise, poor farmers may not understand and appreciate the finance offer and conditions proposed to them. Thus, many microfinance providers, such as BRAC, invest substantial resources in financial literacy training. Indonesian MFIs and even banks also offer financial literacy training. Financial education has been shown to empower poor farmers through knowledge, with positive effects on their use of credit and creditworthiness. The main topics in financial education for farmers are farm-budgeting, savings, managing credit, and using bank services. Such financial literacy education can be provided by MFIs, or through the radio and TV.

6. Agricultural Insurance (index insurance)

Index insurance is an important recent innovation. It is a "derivative" instrument in that the pay-out to farmers is effected when the threshold value for an underlying risk indicator (the "index") is breached, this without actually having to observe the damage done to the farmers' fields or livestock. This greatly reduces the transaction costs, the risk of moral hazard and adverse selection. In many index insurance policies, multiple thresholds are defined, with increasing pay-outs as the risk event increases in severity. The index can be based on the amount of rainfall (lack of or excess), humidity levels, arrival of locusts, water levels in a river, occurrence and strength of a hurricane, sea-surface temperature, frost, hailstones, etc. This requires highly capable and independent measurement tools, such as weather stations. Remote-sensing techniques with satellites are being used as well (e.g. Canada, USA). In some insurance systems, an estimate is made, via sampling, of the average crop yield in an agricultural region (e.g. Brazil). Farm losses are modeled with actuarial methods (given detailed and long-term data). Successful index insurance is characterized by a high level of transparency and rapid payment after the index has been triggered (both are a problem in traditional harvest insurance, which requires assessment of actual losses by an expert).

To be effective, the index used must be highly (and spatially) correlated with the damage that farmers actually incur (in order to avoid basis risk). Thus, the literature shows examples whereby the index consists of several risk variables (Dos Santos, 2010, example from India). Furthermore, to counter basis risk, the places where the index is being monitored (i.e. weather stations) must be sufficiently close to the farmers. This can be a problem in regions with many different sub-climates. Also, such weather stations must be of high quality, make very frequent measurements, and preferably transmit these real-time to a base station for analysis. To facilitate

acceptance by farmers, the index must be easily and objectively observable, and understood by all. An objective and easily verifiable index, with measurement conducted by an independent body, also facilitates re-insurance in the international market. This is crucial because the systematic nature of a natural disaster can easily overwhelm local insurers. Re-insurance policies can also be securitized and sold on the international capital markets.

The key innovation in combining index insurance with credit is the standardization of the approach, making reinsurance possible, and thus reducing lending risk. In many of the successful examples, index insurance is part of a value chain finance approach. This also solves the problem of how to distribute the insurance. Index insurance incorporated into value chain financing is distributed by the same entities that provide the credit, namely traders, technical operators, farmers' associations, or (micro) finance institutions.

7. Value chain finance

In our fast-paced development context, value chain finance is an evolving term that has taken on a range of meanings and connotations. The flows of funds to and among the various links within a value chain comprise what is known as *value chain finance*. Stated another way, it is any or all of the financial services, products and support services flowing *to and/or through* a value chain to address the needs and constraints of those involved in that chain, be it a need to access finance, secure sales, procure products, reduce risk and/or improve efficiency within the chain.

Value chain finance offers an opportunity to expand the financing opportunities for agriculture, improve efficiency and repayments in financing, and consolidate value chain linkages among participants in the chain. It can improve the quality and efficiency of financing agricultural chains by: 1) identifying financing needs for strengthening the chain; 2) tailoring financial products to fit the needs of the participants in the chain; 3) reducing financial transaction costs through direct discount repayments and delivery of financial services; and 4) using value chain linkages and knowledge of the chain to mitigate risks of the chain and its partners. As agriculture and agribusiness modernize with increased integration and interdependent relationships, the opportunity and the need for value chain finance becomes increasingly relevant.

Value chain finance is not a new concept. What is new, however, is how ubiquitous it has become. Value chain partners reduce the information asymmetries that banks and MFIs are confronted with, efficient distribution of credit to smallholder farmers is made possible, and the loan is secured by a confirmed sales contract. The literature (Swinnen *et al.,* 2010) demonstrates that farmers included in value chains find it easier to access credit and do so in larger numbers than farmers who lack the backing of value chain partners. Indeed, in some countries and particularly in Southern Africa there is practically no financing outside of value chains.

The key difference between "new style" value chain finance and the forms practiced in the 1960s and 1970s is that these are now introduced by the private sector, not by state-controlled entities. Private traders, retailers, agro-processors, storage providers and distributors contract with smallholders, banks and with each other to serve each other's business interests, including credit.

The term "value chain finance" covers many different concepts and modalities of financing, the most important of which are summarized below:

Trade credit: Farmers receive credit from input suppliers, intermediary traders and shops, or agro-processors, pledging to repay from future harvest income. Typically, this does not directly involve a bank, and the agreement is usually informal and based on trust. Trade credit is often provided in-kind (seeds, fertilizers, consumption goods), and payment is made in kind as well (final produce). Such arrangements nearly always concern seasonal credit only. The cost of credit (interest) is embedded in the agreed prices for inputs and outputs, and may be quite high.

Contract farming: A trader, exporter or agro-processor establishes pre-harvest purchase contracts with selected farmers or their representatives (an association or cooperative). This involves forward contracting of the crop (the price or pricing formula is fixed). The main motivation is to secure a supply of produce, of a certain quality and at a specified time. Technical support to ensure quality may be part of the contract. Product standards are agreed to beforehand. As part of the forward contract, farmers receive partial prepayment. A bank can also be involved through a triangular arrangement (the sales contract becomes the surety). This arrangement nearly always concerns seasonal credit only. A special case is pre-harvest credit provided to cooperatives, enabling them to buy goods from their members. Pre-finance usually has a maturity of only several weeks.

Out grower scheme: An out grower scheme is an elaborate contract-farming arrangement emanating from a nucleus – a lead farm or processor (also called a "technical operator") — which gives out growers access to its marketing, operational and logistical capabilities. Technical support may be provided to the out growers. Loans may include investment financing (*e.g.* in trees and equipment). Out grower schemes are most common in high-value, specialty crops with niche markets.

Warehouse receipt financing: The key innovation in warehouse receipt finance is that it solves a financing and collateral problem. It offers the bank a safe and liquid collateral asset, which is easy to monitor. In Tanzania, defaults on warehouse receipt finance are below 1%. However, warehouse receipt finance is a post-harvest

financial product, applicable only when the farmer has already completed a harvest cycle. Therefore, the initial harvest cycle must be financed with the farmer's own funds or other credit resources.

Warehouse receipt finance is a form of secured lending to owners of non-perishable commodities, which are stored in a warehouse and have been assigned to a bank through warehouse receipts. Warehouse receipts give the bank the security of the goods until they have been sold and the proceeds collected. Given the limited collateral available to support farmers' financing needs, such post-harvest commodities and warehouse receipts represent a liquid form of collateral against which banks can lend. When a well functioning warehouse receipt system is in place, farmers have a choice in deciding whether to sell immediately after harvest (when prices are often lowest) or to store in a licensed warehouse and to apply for a short-term credit (thus enabling farmers to sell at a later date, when prices may be higher). Warehouse financing also enables aggregators and processors to secure their sourcing throughout the year and to purchase their raw materials. There is significant upfront work required to create, operate, and monitor a full warehouse receipt system.

Necessary preconditions for a warehouse receipts system in which smallholder farmers can participate are many: a legal environment that ensures easy enforceability of the security, and makes warehouse receipts a title document; reliable and high-quality warehouses that are publicly available; a system of licensing, inspection, and monitoring of warehouses; a performance bond and/or indemnity fund; banks that trust and use the system; agricultural market prices that reflect carrying costs; supportive public authorities; and, Well-trained market participants.

Even with the necessary preconditions in place, there remain risks in warehouse receipt systems, including: (i) fraud or collusion; (ii) credit and counterparty risk; (iii) storage risk and misappropriation by warehouse operators; (iv) price risks, given the volatility in agricultural commodity prices and government price intervention; (v) marketing or buyer risks; and, (vi) legal risks concerning perfection of security, registration of prior claims, and enforceability. Nevertheless, both the Tanzanian NMB as well as the HDFC evidenced how warehouse receipt schemes can thrive sustainably.

8. Using modern communication technology

Recent advances in communication technology affect rural banking by facilitating electronic payment systems and using portable smart technologies.

The spectrum of possibilities for banks, mobile operators, MFIs, and other financial service providers spans a number of possible services, from traditional mobile banking to remote payments. There are benefits and drawbacks for each of the deployable technologies, mainly with regard to security and control on the part of the banks.

Mobile payment systems: Information and communications technology innovations, including mobile payment services, have strong potential to enhance rural outreach by reducing transaction costs. Mobile phones operate at the intersection between rural clients and banks by providing cheap transaction services, electronic savings accounts and, in limited cases, even credit functions. The most prominent example is the service M-Pesa, provided by the mobile network operator Safaricom in Kenya, which has developed into one of the largest banks in eastern Africa. In countries lacking the technical and commercial infrastructure for ATMs and point-of-service devices, mobile phone banking in particular can be a low-cost way to expand access to financial services in rural areas. Mobile payment systems can benefit farmers by allowing them to receive payments as electronic credit into their mobile phone-based account (or "m-wallets") instead of waiting or having to travel to obtain cash payment. Farmers then have more flexibility and choice of when and how they use their credit. From the bank perspective, an additional benefit of providing such low-cost financial services is that smallholder farmers can gain a transaction history with a bank that could enable them to access loans, insurance, and savings products.

A challenge with these innovations is that mobile banking is relatively new within the financial infrastructure system, and there is no existing legislation for mobile phone banking in many countries. As successful and proportionate regulation in Kenya has demonstrated, it is possible to strike the right balance between supervisory requirements and the development of financial access.

Biometric technology: A biometric is a measurement of physical or behavioral characteristics used to verify or analyze identity. Common biometrics includes a person's fingerprints; face, iris, or retina patterns; speech; or handwritten signature. These are effective personal identifiers because they are unique and intrinsic to each person, so, unlike conventional identification methods (such as passport numbers or government-issued identification cards), they cannot be forgotten, lost, or stolen.

Biometric technology can also improve access to credit and insurance markets, especially in countries that do not have a unique identification system, where identity fraud—the use of someone else's identity or a fictitious one—to gain access to services otherwise unavailable to an individual is rather common. For example, lenders in Malawi describe past borrowers who purposefully defaulted then tried to obtain a fresh loan from the same or another institution under a false identity. And, although less common in developing countries because markets are less developed, the potential for sick individuals without healthcare coverage to use the insurance

policy of a friend or relative does exist. The response of lenders and insurance companies has been to restrict the supply of such services to the detriment of the greater population, not just those people committing identity fraud.

In the case of credit, biometric technology can make the idea of future credit denial more than an empty threat by making it easier for financial institutions to withhold new loans from past defaulters and reward responsible past borrowers with increased credit. As a result of this inability to "cheat the system," individuals may take out smaller loans that they are able to repay or avoid borrowing altogether if they cannot pay back any debt. Borrowers may have greater incentives to ensure that production is successful, either by exerting more effort or choosing less risky projects, and—whenever production could cover the loan repayment—borrowers may be less likely to default intentionally or opportunistically.

9. Lessons learned /Synthesis and Conclusions

Geographical factors that make distribution of financial services to rural clients difficult and expensive, bankers have (often rightly) concluded that agricultural loans are too risky due to low farm productivity and climatic factors that make harvest results unpredictable. Furthermore, banks and many MFIs lack the products and (risk management) tools to finance agriculture because the sector is simply not their commercial priority. Other problems include regulations that keep banks and MFIs from charging an interest rate that covers the true cost and risk of agricultural lending. Finally, continued subsidized agricultural lending (through state-affiliated distribution channels) discourages private commercial lenders from entering this market. This study emphasizes that the weaknesses and risks found in agriculture are not solved by financial institutions with financial products. This study proposes that agricultural credit by itself does not make the wheat grow taller, and agricultural insurance does not stop the weather from destroying the crop. Indeed, decades of agricultural credit programmes have had little effect on agricultural development. To some extent, the opposite may have happened, as in Tunisia and India where farmers have become over indebted with little to show for it in agricultural results. To have impact on agriculture, financial services must be structured to induce farmers to make innovations in their operations. The elements key to innovative agricultural finance: 1) reduce delivery costs (efficient lending methodologies, technology); 2) adapt to agricultural growth patterns and cash flow cycles; 3) use value chains to ensure proper loan repayment (that credit is used for the intended purpose, that it results in increased productivity, that the farmer sells to the intended buyer, and for a fair price allowing repayment).

Indeed, the value chain is central to nearly all agricultural finance innovations and key to banks' risk management. Many of the practical examples throughout this study are grounded in value chain logic. Credit risk is reduced by a viable sales contract and implicit technology transfer. The trigger in value chain finance is the linking of the value chain partners; finance is just the oil in the system. Likewise, most successful examples of agricultural credit guarantees or insurance aim to make value chains operate smoothly. By mitigating performance and price risks, producers and buyers can efficiently collaborate in the value chain. There is no doubt, therefore, that value chain thinking has to take centre stage in the development of agricultural finance. Warehouse receipt finance is a case in point. The financing technology is simple: a farmer puts valuable liquid assets in a secured place, and pledges the crop to a bank or MFI in exchange for credit. However, from a value chain point of view, the benefits vastly exceed the increased access to credit. Through secure storage, crop losses are reduced. Price risk is reduced and managed. Farmers are encouraged to focus on quality because the warehouse grades and certifies their products upon arrival —which may not happen when the product is sold to village traders. Quality and grading open up export and high-value urban markets. Seeing such benefits, farmers start to look for proper farm inputs and seek collaboration with others to share knowledge, input supplies and sales. This in turn leads to lower costs for inputs and higher revenues from products sold in larger quantities.

Although there are differences among financial institutions, MFIs, savings and credit cooperatives and similar entities do not on average invest more than 10% of their portfolios in agriculture. Thus, although microfinance in all its variations is important for rural communities, the impact on agriculture is somewhat disappointing. Just like banks, MFIs fear the risk of agricultural lending. Nevertheless, previous studies also show that at present, microfinance is the most credible channel for bringing financial services to smallholder farmers. Thus, microfinance is an important innovation, but requiring careful support, regulation and prudential supervision.

Furthermore, the past few years have brought about a rethinking of the old paradigm of minimalist microfinance. There is little evidence that credit alone significantly raises agricultural productivity. This leads to an increased interest in combining credit with agricultural training and advice (mostly provided by outside specialists). MFIs and some banks in Asia and Latin America in particular, provide financial education to their clients. This helps them better manage their finances, use the credit wisely and avoid over indebtedness.

Some other innovations discussed in this study relate to the use of new technologies, mobile phones in particular. Mobile phone companies and banks in developing countries, either in collaboration or on their own account, are leapfrogging their rich world peers in technology, innovation, and thereby efficiency and outreach. Millions of (previously) unbanked poor peasants gain access to increasingly advanced financial services over the

mobile phone, which just about everybody carries now. By linking with village retailers who act as cash dispensers, a vast rural bank network is created. Banks and MFIs have also introduced ATMs on wheels, biometric technology, and a host of other technologies. The final impact on agricultural finance in developing countries is yet to be established, but it will almost certainly be huge.

The study also shows that successful agricultural finance for smallholders requires prior group formation through associations or cooperatives because this is the only way to reach such farmers cost-effectively. Collectively, farmers have a stronger bargaining position with input and output traders as they can reap economies of scale and advocate for their interests. Access to technology and finance is also increased because the group representatives can effectively intermediate between the farmers and service providers, whose understanding of doing business may not be the same.

This study reveals that nearly all innovations in agricultural finance are being introduced and implemented by the private sector. However, governments play a key role in facilitation and regulation. To start with, this study believes that government should do away with price and interest rate distortions, which misdirect agricultural resources and continue to this day. In addition, in order for the abovementioned financial innovations to come to fruition, governments need to establish the required legal and regulatory environment. Financial institutions hesitate to conduct leasing, warehouse receipt finance or to finance farm contracts simply because they are not sure they are legally covered in terms of collateral, which often is not of the bricks-and-mortar type. Procedures to register and perfect collateral are slow and expensive, and once a loan is in default, seeking legal redress is complex and lengthy. Banks respond by being extremely risk averse and charging high interest rates.

Governments also need to license, regulate and supervise entities that are custodians of somebody else's money or goods, such as (agricultural) banks, microfinance institutions, savings and credit institutions, insurance companies, and certified warehouses acting as collateral managers. The same is true for providers of essential information, such as weather stations or product weighing/grading services. In support of financial innovation, governments can provide grants or guarantees, but must ensure this strategy results in "crowding in" the private sector, which could continue service delivery unaided after public support has ended.

In general, access to agricultural finance is constrained by many factors. These factors are different for different country since the reality of each country is different. Most agricultural finance constraints can be categorized as: operational constraint, Capacity constraint, vulnerability constraint and politico-legal constraint. Different country faces different constraints. To alleviate these constraints agricultural Finance Innovations are evolving. By considering each countries specific situation, agricultural finance innovation addresses specific constraints. In implementing agricultural finance innovation, each country faces different challenges. Every agricultural finance innovation has its own precondition and success factor for its successful implementation. Successful agricultural finance innovation in one country may not be successful in another country. So, before implementing any agricultural finance innovation, research has to be conducted.

References

Bessant, J., and Tidd, J. (2007). Innovation and Entrepreneurship. Wiley and Sons Limited. UK Chalmers, 2005

Campaigne, J. And T. Rausch,(2010) "The experience of DrumNet"; International Food Policy Research Institute (2010), "Innovations in Rural and Agricultural Finance", thematic papers, Washington, DC.

Chalmers, Geoffrey , 2005, A Fresh Look at Rural and Agricultural Finance , RAFI Note #1, An AMAP/BASIS Publication, USAID's Rural and Agricultural Finance Initiative, Chemonics, ACDI/VOCA, Ohio State University and DAI.

Cohen, M.(2010), "Financial literacy"; international food policy research institute (2010), "Innovations in Rural and Agricultural Finance", thematic papers, Washington, DC.

EFSE (2010), "EFSE Development Impact Study - Development impact of agricultural finance", EFSE, Frankfurt.

Hotho, S and Champion, K. (2011). Small Business in the new Creative Industries: Innovation as a people Management Challenge. Management Decision. 41(1). pp. 29 – 54.

IFAD (2007, 2009), Rural Finance Policy, IFAD, Rome.

IFAD, Dos Santos, (2010)Decision Tools for Rural Finance. IFAD. Accessible at: http://www.ifad.org/ruralfinance/dt/full/dt_e_web.pdf

Jessop, Reuben, Boubacar Diallo, Marjan Duursma, Abdallah Mallek, Job Harms, and Bert van Manen. 2012. "Creating Access to Agricultural Finance: Based on a Horizontal Study of Cambodia, Mali, Senegal, Tanzania, Thailand, and Tunisia." Prepared for the Agence Française de Développement. http://www.afd.fr/webdav/site/afd/shared/Publications/Recherche/Scientifiques/A-savoir/14-VA-A-Savoir.pdf

KIT and IIRR. 2010. Value chain finance: Beyond microfinance tor rural entrepreneurs. Royal Tropical Institute, Amsterdam; and International Institute of Rural Reconstruction, Nairobi. http://www.kit.nl/net/KIT_Publicaties_output/ShowFile2.aspx?e=1610

Langenbucher, Anja,. 2005. "Warehouse receipt financing and related collateralized lending mechanisms".Background briefing material prepared for the Commodity Risk Management Group, Agriculture and Rural Development Department of the World Bank.

Mahajan et al (2010). Combining Extension Services with Agricultural Credit: The Experience of BASIX India

Miller, C. (2011), "Agricultural Value Chain Finance Strategy and Design", Technical Note, FAO, Rome.

Miller, C. (2008), "Twelve Key Challenges in Rural Finance", FAO Rural Finance Workshop, 28 Oct, FAO, Rome.

Nair A., (2010). "Rural Leasing". International Food Policy Research Institute (2010), "Innovations in Rural and Agricultural Finance", thematic papers, Washington, DC.

Schrieken, P.B. (2007), "Microleasing: two cases from Africa", Hivos, The Hague.

Temu, A. E. (2009) Innovations in Addressing Rural Finance Challenges in Africa. A Presentation made at the AFRACA Technical Workshop of 2008. Dar - es - salaam, Tanzania: AFRACA.

Wampfler B., Lapenu C., 2002, La microfinance au service de l'agriculture familiale. Résumé executive du séminaire international, 21-24 janvier 2001 Dakar Sénégal. Afraca Cirad Cta Mae Enda Graf Fida Cerise. Français / Anglais. Ministère Français des Affaires Etrangères Série « Partenariats ».

World Bank (2005), Rural Finance Innovations – Topics and Case Studies (DrumNet), World Bank, Washington, D.C.

Zeller, Manfred.2003. "Models of Rural Finance Institutions." Paving the Way Forward for Rural Finance: An International Conference on Best Practices, June 2003. http://www.basis.wisc.edu/rfc/documents/slides/theme_models_slides.pdf#search='Manfred%20Zeller

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

Academic conference: http://www.iiste.org/conference/upcoming-conferences-call-for-paper/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar