



**Understanding Demand, Driving Innovation:
Smallholder Households and Financial Services**

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Note: This paper includes data from the CGAP financial diaries with smallholder households. Data collection took place between June 2014 and July 2015 in Mozambique, Tanzania, and Pakistan and some of the data is still being cleaned and finalized. With this in mind, some of the data presented in this draft may change slightly as part of this process. The final version of the paper will include the final data on the CGAP smallholder diaries.

While there has been renewed appreciation for how reaching smallholder households could drive financial inclusion, little is known about this unique and yet massive client group. Even data on the very number of smallholder households worldwide is fraught with caveats and nuance. Information about how they manage their financial lives and the tools they demand to do so is even more difficult to find, and further complicated by the many different ways of defining what a smallholder is.

Working to build the evidence base on smallholder households, CGAP has been conducting financial diaries, national surveys, and sectorial segmentations in a number of markets. This research is designed to provide a data-rich, deep understanding of the demand for financial services by smallholder households, based on a careful analysis of their livelihoods and an accurate depiction of their agricultural and financial lives. The purpose of this landscaping paper is to provide background for this demand-side research, drawing on existing literature and recent developments in both financial inclusion generally and smallholder finance specifically. It is intended to orient the smallholder financial diaries and national surveys, and other demand-side research with this client group, in the larger ecosystem and long history of related research and experience.

I. Introducing the Research Questions

As a global consortium of 34 leading organizations seeking to advance financial inclusion, CGAP has five strategic priorities, and financial innovation for smallholder households is one. Its demand-side research with smallholder households is organized along three avenues of inquiry:

1. **What are the key segments of smallholder households?** Segments can be defined in multiple ways, relying upon demographics, agricultural activities, interactions with markets, relevance of non-agricultural activities, and other features. What kind of segmentation would yield the best understanding of smallholders' demand for financial services? And build better business cases for how to meet their demand for these financial tools?
2. **How do smallholder households perceive their agricultural and financial lives?** Understanding what smallholders want, including whether they perceive their agricultural activities as a business or purely as subsistence, their perceptions of their financial lives and the financial actors surrounding them, and their aspirations for the future generations, is essential to inferring their demand for multiple goods and services, including finance.
3. **What are the demand and supply of financial services, and therefore the opportunities?** The demand for and usage of informal and formal financial services among smallholder households needs to be clearly measured and understood. On the supply side, the current and potential role of digital financial services, including its limitations, is important to explore, among other points. Taken together, this analysis will identify gaps and opportunities to improve financial tools for each segment of smallholder families.

This first chapter serves as background for these three themes. It first provides an overview of the significance of smallholders in poverty-focused research and interventions. It then outlines key areas of interest to improve smallholders' wellbeing, bringing in the role of finance generally. A discussion of how the demand for financial services stems from the multiple activities smallholder households – farm and non-farm income generation, consumption, investment – is included in the second chapter, which also explores the supply side of the equation.

To add life to the literature on these themes, this paper draws upon data and insights from three demand-side research efforts that examined the financial lives of smallholder households in great detail. Few books have been more influential on our current understanding of the economic lives of the poor

than *Portfolios of the Poor* (Collins et al, 2009, referred to here as “PoP”).¹ It portrays the intricate and intense financial lives of 250 poor households in Bangladesh, India, and South Africa with insightful clarity, and opened up a unique approach to research. The Kenya Financial Sector Deepening Trust (FSDK) conducted the Kenya Financial Diaries (2014), engaging with 300 households, including a sub-sample of smallholder households, in five areas of the country over the year. And finally, the 2014-2015 CGAP financial diaries with smallholder households (“smallholder diaries”) tracked the household cash flows of 280 smallholder households in Mozambique, Tanzania and Pakistan, paying particular attention to their agricultural production and in-kind consumption.²

In the financial diaries methodology, interviewers capture a complete set of individual cash flows from the preceding two-week period throughout an entire year in the lives of a sample of households. Over the course of the interaction, interviewers ask household members about their various income sources, expenses, financial tools, and transactions in order to balance all the sources and uses of money in this period. Since in-kind transactions can make meaningful contributions to household well-being, interviewers also record the amount of select in-kind transactions and their approximate value.

Financial diaries track the multiple streams of income that fall within the major categories of income sources, such as “agricultural production income” and “odd job income.” When a family earns income from a variety of agricultural production activities, for example, each different crop and type of livestock production is considered a separate source of agricultural production income. The smallholder diaries data application tool also included a crop tracker to capture household consumption of agricultural products, such as eggs and milk, in addition to any other changes in stock (e.g., sales, crop loss). This information paints a picture of crop revenue fluctuations in smallholder households over the course of the year and illuminates their dependence on the in-kind consumption of their production and the magnitude and implications of crop loss they experience.³

A. Smallholder households matter

Rural smallholders in poverty numbers

“There are an estimated 450 million smallholder farming households (representing two billion people) relying to various degrees on agricultural production for their livelihoods. They represent the largest client segment by livelihood of those living on less than \$2 a day.” This summary statement presenting CGAP’s Financial Innovation for Smallholder Families initiative is partially based on an FAO publication (Lowder, Skoet, and Singh, 2014), and previous estimates by Dalberg (2012) and Christen and Anderson (2013). The orders of magnitude for the number of smallholder families vary across different sources and methods (see Box 1), but a range between 400 million and 500 million is generally accepted, using the threshold for “small” as less than two hectares of farmland.⁴

Implications of this dominance among the poor are several. Targeting smallholders in poverty reduction programs seems an obvious assurance that the program is dealing with a large segment of the poor, but formulating effective programs remains a challenge. Hence the importance of segmenting the broad

¹ Others worth mentioning are Rutherford (2000), Armendariz and Morduch (2010), and Banerjee and Duflo (2011).

² CGAP retained the services of Bankable Frontier Associates to manage the Smallholder Diaries.

³ For a more complete discussion of the financial diaries methodology, see Anderson and Ahmed (2015).

⁴ A brief discussion of the issues associated with using hectares to categorize farm size is included later in this paper.

smallholders client group. In addition, understanding the root causes of poverty among each of the smallholder segments is essential to formulate effective poverty alleviation interventions.

Box 1. Smallholder families are a dominant component of the world's poor: A summary of estimates

Lowder, Skoet, and Singh, 2014. These FAO estimates find at least 570 million farms worldwide, of which more than 500 million can be considered family farms. More than 475 million farms are of less than 2 hectares in size. Main source for this study is the FAO (2013) 2000 Census of Agriculture, although numerous national censuses are also referenced.

Christen and Anderson, 2013. This paper compiles extensive references to conclude that the range of smallholder farms of less than 2 hectares is between 400 million and 500 million, encompassing between 1.5 billion and 2.5 billion people living in these households.

Dalberg, 2012. This report takes its 450 million smallholder farmers estimate from FAO and UNDESA sources.

Wyman, 2007. An earlier estimate placed the number of smallholder farmers at 610 million, the largest livelihood-based segment, representing about 37 percent of all the working-age poor, under \$2 a day per person (Wyman, 2007). The definition of smallholder in this source, however, is not clear. Further, the count refers to "working age poor" not households, so it cannot be contrasted against the preceding estimates.

Rural populations and reliance on farming in poor countries

Rural populations account for the majority of total population in most low-income countries, and overall rural people account for 55 percent of the total population in low-income countries worldwide (IFAD, 2011). While in some regions urbanization is reversing the relative importance of rural areas (e.g., LAC, MENA), rural areas remain dominant as place of residence and occupation in all other regions and in most low-income countries. Further, agriculture typically represents a large share of poor countries' total employment. Figure 1 shows a declining pattern for the primary sector (agriculture and mining) as source of employment as countries' income levels increase.

Globally, agriculture accounted for 35 percent of employment in 2009 (ILO).⁵ While the share of agriculture in total employment has been declining, it remains high in Sub-Saharan Africa (about 59 percent) and South East Asia and the Pacific (at 44 percent, same year).⁶ Specific to the countries of interest in this work, the share of employment in agriculture in Mozambique was estimated at 75 percent in 2007 (Finmark, 2012), although the same source states in its executive summary that about 69 percent of the population in Mozambique is rural and reliant on agriculture (estimate also for 2007).⁷ In Pakistan the share of agriculture in total employment reported by ILO was 45 percent (2008, latest available), while it reached 72 percent in Uganda (2013, same source).⁸ The Uganda Bureau of Statistics estimates that share at 76 percent.

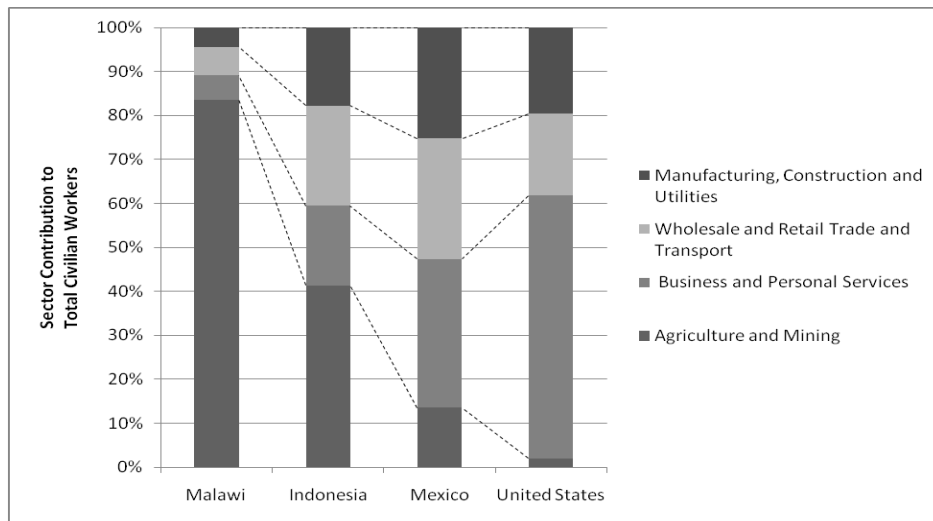
⁵ ILO definition: The *employed* comprise all persons of working age who during a specified brief period, such as one week or one day, were in the following categories: a) paid employment (whether at work or with a job but not at work); or b) self-employment (whether at work or with an enterprise but not at work). ILO- ILOSTAT.

⁶ The share of agriculture in total employment in developed economies was 3.7 percent in 2009; 1.5 percent in the USA (2013, ILO Country Profiles)

⁷ A possible explanation for this apparent contradiction is the inclusion of fisheries in the 75 percent estimate, likely to be a relatively large employment source in Mozambique that do not necessarily involve residence in rural areas.

⁸ No sector shares reported for Mozambique or Tanzania in the ILO site.

Figure 1. Percentage distribution of civilian workers across sectors at different income levels: Malawi, Indonesia, Mexico, and the United States



Source: Schaffner, 2013

LSMS-ISA data indicate that a majority of households in low-income countries are considered “agricultural.” For example, 85 percent of households in Tanzania are considered agricultural, meaning that they cultivated land, reared livestock, or managed fisheries (Derksen-Schrock et al, 2012).⁹ While defining a rural household as “agricultural” in the sense that it practices agriculture in some form – crops, livestock – seems rather straightforward, there is no clear consensus on what makes a household “reliant” on agriculture (or “agriculture dependent” in other versions). The latter involves some assumption about the importance of the agriculture practice in overall household income and more generally in its wellbeing broadly defined, as well as the household members’ own perception of their identity. This can vary from pure (or below) subsistence and source of shelter (housing value) to a substantial share of agriculture in total household revenue in commercial holdings. Pingali (2010) has cogently summarized this spectrum of possibilities (see Box 2).

Box 2. Who is the smallholder farmer?

“So as we talk about smallholders and smallholder agriculture, who is the smallholder? ... - a smallholder, she could be anyone of different types of farmers. She could be a subsistence farmer eking a living out of a tiny plot of land. She could be a post-Green Revolution farmer trying to sustain the productivity gains that were made during the Green Revolution. She could be a commercializing farmer that’s trying to link up to the value chain, the value chain that connects to the local markets, the regional markets, and even the global markets.” (Pingali, 2010, p 2)

⁹ LSMS-ISA identifies households that are engaged in agricultural activities using the following criteria: “if the household head or any member of the household cultivated any land, raised or owned any animals, or produced any agricultural by-products from their farm and/or livestock” (Klapper and van Oudheusden, 2015, p. 4).

Relevance of smallholders to food security

Smallholders represent an increasingly important component of global food supply, with large companies increasing their reliance on smallholders to secure reliable product supply (Dalberg, 2012). Case-study evidence mainly from IFC's work supports the notion of an increasing reliance on smallholders by large companies (IFC, 2012; Vaena and Gaeaneotes, CGAP blog, 2014). In certain sectors, smallholders may represent the vast majority of local supply; for example, a recent study of the dairy value chain in Pakistan reports that about 80 percent of the dairy cattle are in herds of less than five cows and account for 60 percent of total milk production (AgriFin 2015).¹⁰ Further, as indicated in chapter II, own production accounts for a large share of household consumption ("in-kind" household revenue), up to 100 percent in the case of pure subsistence farming.

On the other hand, over-reliance on smallholders as key sources of massive increases in production has been criticized as misguided. Further, the argument goes, the focus on smallholders may indeed hinder poverty reduction. Fast labor productivity growth, a crucial ingredient in large-scale production increases, may require an approach that integrates smallholders with large-scale commercial enterprises (Collier and Dercon, 2009). Nonetheless, [small farms] "are getting more numerous and smaller than ever ... account for large shares of the total agricultural area and output ... [and include] half of the world's undernourished people and the majority of people living in absolute poverty" (Hazell, 2011).

In a dynamic context, as economies grow, agriculture evolves from being dominant in contribution to GDP and employment to becoming less important for driving growth and employment. In this process, small farms begin to lose ground to larger and more capitalized farms able to capture scale economies. Rising per capita incomes and urbanization further accentuate the comparative advantage of large, commercial farms capable of supplying high-value products (Hazell et al, 2007). The implications of this dynamics for prioritizing smallholder agriculture are that it needs to be maintained and only reduced "once the transformation of a country is well underway, and the focus should shift to larger farms and high-value products" (Hazell et al, 2007, p. 6).

A "bottom line" from this debate – if there is one – is that for low-income countries with a high proportion of the population in agriculture, low economic growth rates, and scarce employment opportunities outside of agriculture, poverty reduction must rely on agricultural productivity growth. Large numbers of smallholders in these scenarios make them a main source of food security, for themselves and for the country as a whole, and a priority sector for the provision of the infrastructure, technology, effective institutions, and incentive systems that smallholders need (Pingali, 2010). It also makes this client group a priority for improving their access to and use of adequate financial services.

Smallholders and financial inclusion

Smallholders are likely to be over-represented among the financially excluded. While no financial inclusion statistics are specifically associated with smallholder households, rural inclusion is lower than urban inclusion (see Table 1 below), and one could argue that general rural inclusion averages over estimates of that of smallholders. Well-known reasons are the high transaction costs of reaching rural households generally, the low population density in rural areas that makes scale economies unlikely to materialize, and the systemic risks in agricultural production that deter financial institutions from lending to agriculture, among others.¹¹ While some of these limitations may not apply to the peri-urban and urban smallholder farmers often found in and around large cities in low-income countries, who are

¹⁰ Pingali (2010) cites the "white revolution" in India that made it the largest dairy producing country in the world, based on women producing milk with one or two cows.

¹¹ See for example Conning and Udry, 2007, and GIZ, 2011.

still largely excluded due to information asymmetries, they certainly apply to the large majority of smallholder farmers.

Hard data on the extent of the smallholder financial exclusion relative to similarly poor non-rural households does not seem to be available. The urban/rural disparities reported in Findex 2011 for adults holding an account range percent from 69 percent urban /50 percent rural in East Asia Pacific to 19 percent urban /9 percent rural in the Middle East and North Africa. The ratios are 38 percent urban /21 percent rural for Sub-Saharan Africa, and 37 percent urban /31 percent rural for South Asia. The Findex 2014 database does not report findings for an urban/rural split due to inconsistencies in the definition of urban/rural across countries, although it claims to include estimates for account penetration in rural populations. The database effectively does have these estimates; the table below was generated using those estimates, and extrapolating the urban account penetration using rural population shares from IFAD Poverty Report (2011).

Table 1. Account penetration in urban and rural areas
Percentage of adults with an account at a formal institution in selected countries¹²

Country	Urban Adults (percent)	Rural Adults (percent)
Pakistan	11	8
Tanzania	33	14
Uganda	27	19

Source: Authors' estimates using Global Findex database (2014) and population shares (IFAD 2011)

B. Improving smallholders' wellbeing

Multiple variables are associated with rural poverty and smallholder households' wellbeing

While the focus of CGAP's smallholder initiative, and of this background paper, is smallholders' demand for financial services, and the innovations that may fill current gaps in the supply of those services, a number of other factors impinge upon the ability of smallholders to prosper. These are briefly reviewed in this section, as they likely influence the attributes smallholders seek in financial services (explored in the section below).¹³

Limited land and assets holdings. The "smallness" of the farm seems an obvious constraint, albeit some argue that smallness is not the problem, but rather the failure of the state to provide the right conditions "that allow smallholders to flourish" (Pingali, 2010, p. 3). The fact that land is not homogenous makes it difficult to define a universal threshold to define "small" in terms of land area. As an illustrative example, two hectares could be (and is often) defined as a threshold for "small;" but if two hectares in the Red River valley near Hanoi produce three crops of rice a year, while two hectares in the northern highlands of Viet Nam only produce one rice crop a year (likely of lower yield than the irrigated land in the valley), then should the "small farm" definition for the northern highlands be adjusted to at least 6 hectares?

¹² The Global Findex database does not include Mozambique.

¹³ Main sources for this section, among the many available, are Gollin, 2014, and Hazell, 2011. Others referred to as appropriate.

Further there is the issue of land measurement. Most low-income countries do not have an official cadaster of land plots and farm properties. Hence, farm size statistics rely upon self-reported areas by the farm owner/user. A recent study comparing self-reported against (more accurate) GPS area measurement found that self-reported area systematically differ from GPS land measures. Interestingly, smaller-scale farmers tended to over-estimate their land size, by as much as 100 percent for very small plots, while farms with GPS area above two acres tend to under-estimate the actual (GPS) size when self-reporting (Carletto et al, 2013). These biases have implications for estimates of land productivity. The same production volume, say one ton of maize, divided by the larger self-reported land size (e.g., two acres) will suggest a yield (production/land area = 1 ton/2 acres = half-ton per acre) lower than that same volume divided over the actual, smaller GPS size (e.g., 1.5 acres). Instead, the actual yield for the smaller-scale farmer (1 ton/1.5 acres = 2/3 of a ton per acre) is 33 percent higher than the estimate using the self-reported area.

Given the difficulties of establishing a universal threshold to define “small” farm, the tendency has been to make the definition more complex by relating the land size and availability of basic assets to the ability to sustain (or not) an average household. One could argue, therefore, that the definition of “small” is highly context specific, and should be adjusted to the specific circumstances of a country or region. The current trend seems to favor staying with the two-hectare threshold. The profession has yet to develop the equivalent of the “purchasing power parity” (PPP) used to calculate per capita incomes and make them (more) comparable across countries. The US\$ 1.25 a day for extreme poverty, and US\$ 2 a day for poverty levels are generally accepted as global thresholds because of the PPP factor.¹⁴

Land productivity and labor productivity. Smallholders farm land “more intensively than large farms resulting in high levels of productivity per unit of land” (Gollin, 2014, p. 8). Indeed, there is a large body of empirical evidence that supports the existence of an inverse relationship between farm size and land productivity. This apparent higher efficiency of small farms relative to large farms is obtained at the cost of lower output per unit of labor. The use of family labor in small farms solves many incentive issues associated with agricultural labor markets, such as shirking and costly monitoring (of hired labor). Family labor supply is flexible, internally-motivated, and usually compatible with off-farm employment.

While small farms do not equate to family farms (family farms can be quite large), it seems clear that most small farms are family farms. Their choice of technology will be driven by the relative costs of labor and capital and, where capital is scarce and expensive, small farms will use labor-intensive practices. The other side of this coin is that in labor-surplus economies small farms absorb substantial numbers of workers, primarily family labor but including some measure of (poor) landless rural labor.¹⁵ As countries grow and labor becomes more expensive, however, the long-term viability of small farms weakens.

Limited access to markets. Market access for smallholders’ products is usually through intermediaries, meaning low prices and uncertainty, or in relatively small volumes into local markets. Low volumes to sell, variable quality, limited storage, high transaction costs (mainly for transport), and limited market information are among the factors that create a disadvantage for small farms in marketing their usually limited and seasonal surpluses. Further, as demand for high-value products increases as economies develop, smallholders are not well positioned to meet the often exacting standards associated with these products. Even with the emergence of direct procurement by large supermarket chains from farmers, large farms are better placed to meet quality standards, and present lower transaction and monitoring costs for buyers (Reardon et al, 2010).

¹⁴ The \$1.25 per person per day threshold (at PPP), for example, is on par with the official national poverty lines in the ten poorest countries.

¹⁵ Hazell refers to this state as “a ‘win-win’ proposition for growth and poverty reduction.” (Hazell, 2011, p. 2).

Smallholders' limited access to input markets, formal sector credit, and insurance is well documented.¹⁶ The issues associated with financial services are addressed in detail below. Use of modern inputs has traditionally been a constraint to smallholders, even when heavily-subsidized input delivery by public agencies or agricultural development banks were in place, as these programs were plagued with deviation and elite or political capture thus limiting their effective reach to small farms. Private sector suppliers, the main providers after public programs phased out, understandably favor large commercial farms. Further, small, local input suppliers—often more inclined to serve smallholders—are limited by their ability to acquire and sell large quantities, usually due to their own constraints in accessing finance.

Traditional, outdated practices. The negative effects of limited access to modern inputs are compounded by the scarcity (or outright inexistence) of quality technical support to make improved technologies available and induce their adoption. Access to improved technologies and productive assets has been found essential to enhance smallholder market participation, and their avoidance of semi-subsistence poverty traps (i.e., a situation in which they operate with rudimentary production techniques, limited assets, and low or no participation in markets that prevents them from acquiring better techniques and basic assets that enable their market participation, which can offer a gateway out of the trap) (Barrett, 2007).

While the generation of technology has been successful (e.g., the Green Revolution), its delivery has been the main issue due to low local capacity and weak extension systems. Improving delivery is deemed a top priority and the use of public-private partnerships to that effect (e.g., AGRA) and reliance upon producer organizations (when properly governed and managed) are considered positive steps in that direction. In addition, research and development (R&D) to tackle more difficult problems, such as drought resistance and pest tolerance for crops of importance to low-income households (e.g., cassava, millet, sorghum, coffee), is strongly advocated as the next major step (Pingali, 2010).

Limited access to infrastructure and a range of services. Deficient or non-existent infrastructure, especially roads, transport, irrigation, and organized markets, are prevalent in areas where smallholders prevail. Along with limited market information, these factors conspire to limit small farms' productivity and their ability to market any surplus they may have. In addition, the list of variables associated with rural poverty and smallholders' wellbeing would not be complete without recognizing the limited access to education, health services, clean water and sanitation. While we do not elaborate deeply into these variables, it needs to be borne in mind that the will to satisfy basic needs, especially in education and health, results in preferences for the specific properties of financial tools that need to be considered, along with those resulting from smallholders' production and consumption activities.

Smallholders and financial services over time

The market for financial services is one that needs to improve, along with markets for outputs, inputs, and land, in order to overcome failures that disproportionately impact smallholders. The shortcomings of rural financial markets are well documented in the literature and will be summarized here.¹⁷ An overview of the current understanding of what is needed to improve the functioning of rural financial markets is also provided. A more in depth discussion of financial services as a main theme of this work is covered in chapter II below.

In short, rural financial markets are fragmented and imperfect, have been historically riddled by government intervention leading to financial repression, and then left behind when financial

¹⁶ Hazell, 2011; GIZ, 2011.

¹⁷ A comprehensive review, including theoretical and empirical models of rural financial markets, is found in Conning and Udry, 2007; other sources cited as appropriate.

liberalization followed to eliminate repression. Informal finance, notably input suppliers, traders, and contract farming, dominates financial transactions among rural dwellers, with some relevance of member-owned financial intermediaries or organizations (such as financial cooperatives, self-help groups, and ROSCAs), albeit with a mixed record of outreach and sustainability. Current conventional wisdom is that market-friendly government interventions are required to create or support institutions that perform effective rural financial intermediation. Innovations that reduce transaction costs and improve risk-reducing information flows are seen as conducive to better functioning markets in rural areas. The main elements in this summary are briefly discussed below, and can be seen as a progression over time from the 1950s to the current period.

Fragmented and imperfect rural financial markets. Market fragmentation is observed when different segments of borrowers are sorted across different lenders and engage in contracts under different terms and conditions, as a function of the borrowers' characteristics. In part, fragmentation in rural financial markets is associated with the significant occurrence of bilateral contracts, as between farmers and moneylenders, relatives and friends, and informal insurance arrangements with landlords, or as part of the functioning of ROSCAs. Financial repression resulting from heavy government intervention is likely to contribute to fragmentation through elite capture when those able to obtain subsidized credit establish yet another set of (distorted) terms and condition for loans otherwise similar in nature and purpose to those demanded by excluded farmers.

Government intervention. Directed credit from state-owned banks, interest-rate ceilings, credit-allocation mandates, and other "heavy" forms of intervention characterized most of the 1950s to 1970s in many developing countries. However well-intentioned, the negative effects of these policies in terms of discouraging private financial intermediation in rural areas, high arrears with attendant losses in state-owned banks and fiscal drain consequences, and political capture (e.g., high lending volumes in election years) have been thoroughly documented.¹⁸ These policies are part of what is typically labeled "financial repression."¹⁹

Financial liberalization policies in the 1980s and 1990s, aimed at correcting the effects of financial repression, brought innovations mainly to urban and non-farm rural activities, leaving farming behind—and especially smallholder farming. Most state-owned agricultural banks were shut down or drastically reformed, so even the rural elites they served were now forced to look elsewhere for sources of finance. Private providers cautiously, if at all, reached out to these elites, but what little outreach there had been to smallholders disappeared.

Informal finance. In its many forms, informal finance has been prevalent even during periods of heavy government intervention in rural financial markets, and even more so thereafter. Moneylenders, input suppliers, traders, and landlords are common (and stable) sources of liquidity; relatives and friends perform this role on a reciprocity basis, (i.e., they are sometimes a source of funding and some other times users of the excess liquidity that the farmer may have). Savings groups and ROSCAs attract rural dwellers (usually women) able to make small regular contributions towards obtaining a lump sum via borrowing (as in savings groups) or when their turn comes (as in ROSCAs). Contracts in informal finance are usually "state-contingent" in Udry's terminology, meaning that their terms can be adjusted if unexpected circumstances occur either for the borrower or the lender (e.g., crop failure, medical

¹⁸ Conning and Udry (2007) provide a good summary. Extensive analysis and critique of these policies can be found in Adams, Graham, and Von Pischke (1984).

¹⁹ In addition to interest rate caps, government control of banks and financial institutions, financial repression encompasses high reserve requirements and other capital market restrictions. Under these policies, savers earn negative real interest rates, and governments can issue debt at low interest rates.

emergencies); terms and conditions are heavily dependent on the quality of information lender and borrower have about each other.²⁰

Market-friendly interventions. “In order for a robust set of intermediated financial instruments to be available to rural households, governments must do more than simply get out of the way of private lenders” (Conning and Udry, 2007, p. 76). The importance of macroeconomic stability, a conducive environment for contracts, property rights, secured transactions, and regulatory and supervisory systems that ensure a smooth functioning of financial markets is broadly recognized. Of particular relevance for smallholder finance are regulations that establish agent banking, and tiered KYC requirements conducive to setting up affordable small balance accounts. Further, so called “market-friendly” interventions have been advocated that entail capacity building of financial institutions, temporary “smart” subsidies to enable financial institutions to penetrate new market segments, and public support of information systems and platforms that enable safe and low cost transactions (e.g., factoring and reverse factoring platforms).²¹

The promise of innovations. The introduction of electronic means of transaction, notably mobile-phone banking, holds promise as an effective mechanism to financially include smallholder farmers. What seems to remain a challenge is the extent to which these electronic means of transaction are truly accessible to rural people, especially women, in developing countries. A rather typical pattern, for example, is that mobile penetration in a country, say Tanzania, would be about 80 percent on the aggregate, but only 25-30 percent in rural areas, and about half of that among rural women. Even in relatively high-income economies such as Mexico, signal coverage in marginal rural areas is nonexistent or unreliable, and therefore the cost effectiveness of electronic platforms is undermined by the need to do transactions offline, and batch-synchronize them in nearby towns where the signal is reliable. Ethiopia, with less than one-tenth of Mexico’s per capita GDP, performs government transfer payments in just about the same way.

²⁰ A comprehensive source is Adams and Fitchett (1992). Udry’s work in Northern Nigeria (1994) was instrumental in documenting and analyzing the state-contingent nature of informal contracts.

²¹ See De la Torre et al, 2007.

II. Addressing the Research Questions – Main Themes

This chapter provides background on the main themes associated with the research questions at hand: First, the nature of smallholder household economics; second, how agriculture defines the ups and downs of smallholder household revenues and expenditures; and, third, what can be said about financial services for smallholders. To explore and illustrate these points, the discussion also draws upon data and insights from *Portfolios of the Poor* (Collins et al, 2009), FSD Kenya’s “Kenya Financial Diaries” (2014), and the CGAP financial diaries with smallholder households. A final section formulates implications for policy makers and practitioners.

A. Smallholder household economics

The first section of this second chapter explores smallholder household economics by first considering the range of income sources and expenses they manage. The paper appraises the potential role that mobile phones can play in how households manage their financial lives, and then widens to address household demographics. It explores gender dynamics in household decision-making and financial management and finally turns to the various age groups in smallholder households, responding to widespread concern about youth outmigration from rural areas and out of agriculture, and the implications these trends may have on smallholder household economics.

Income and income sources, expenses and budgeting

In its detailed exploration of the financial lives of poor households, *Portfolios of the Poor* (PoP) describes the “triple whammy”: 1) Incomes of poor households are low; 2) Cash flows are irregular; and, 3) “Existing financial instruments are not well suited to address either of these problems” (Collins et al, p. 52). This third component is dealt with in detail later in this paper, focusing now on the findings that relate to low incomes and unstable cash flows.

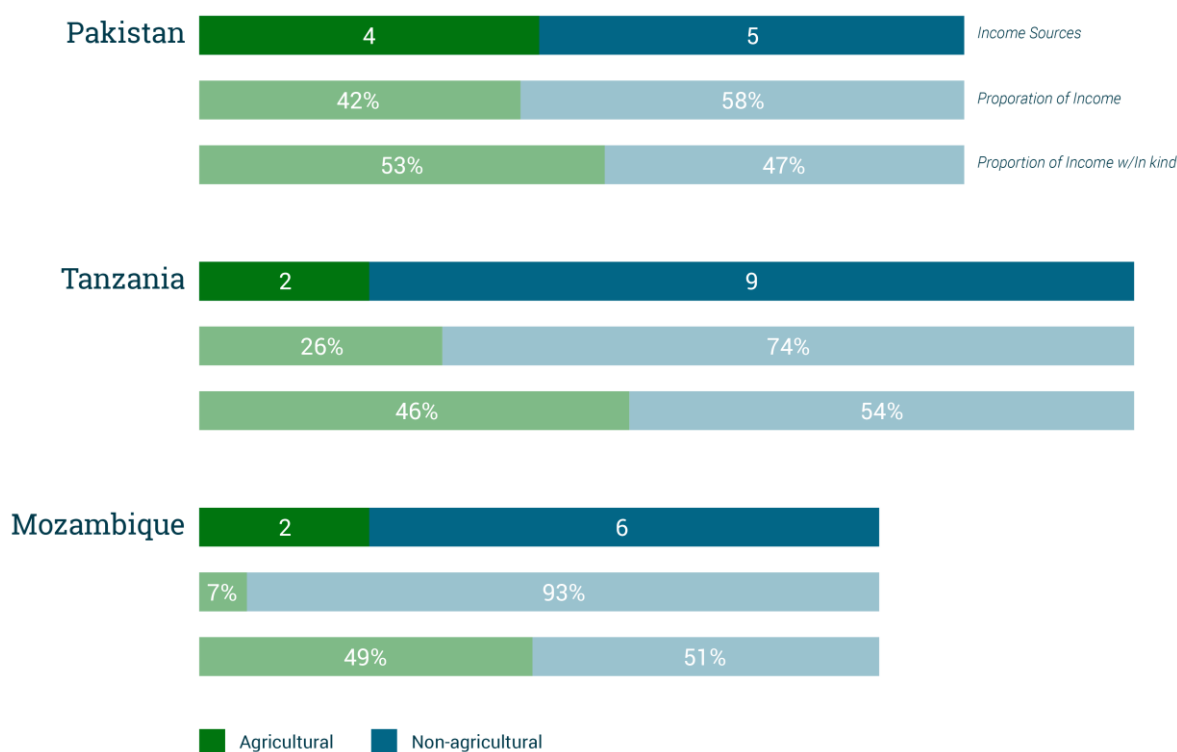
Low incomes from a range of sources. Poor people’s incomes are not only low but also uncertain, due in large part to the fact that they accrue from multiple and also uncertain occupations. The Kenya financial diaries documented 10 separate household income sources at the median, or five when the count excluded “resources received” (i.e., social support from friends and family). PoP’s rural households in Bangladesh and India drew revenue from farming, wage labor working in other farms, fishing, and off-farm labor that included pulling rickshaws and construction work. While the analysis summarizes these sources in three categories—regular wages, casual work, and self-employment—it also makes clear that underlying casual work and self-employment are multiple and unpredictable occupations. In the CGAP smallholder diaries, the sample reports a range of income sources, both related and unrelated to their agricultural activities. In addition to cultivating a range of crops and livestock, the households take part in casual work (e.g., construction work, harvest work on others’ land), manage small businesses selling handmade or consumer goods, and rely on various kinds of contributions and support from friends and family.

It is also pertinent to recall that agriculture is just one of many sources of income for rural households; even if they self-identify as smallholder or agricultural households, agriculture may not be the most important source of income. Across the sample in the smallholder diaries, the median numbers of agricultural and non-agricultural sources of household income in Mozambique are 2 and 6, in Tanzania 2 and 9, and in Pakistan 4 and 5 (see Figure 2). This diversity in types of income sources in smallholder households is interesting, but even more so is the relative proportions of agricultural and non-agricultural income.

At the median, the samples for the smallholder diaries in Tanzania and Pakistan earned 26 percent and 42 percent respectively of their household income from their agricultural activities.²² Among the sample in Mozambique, in contrast, 7 percent of household income (i.e. revenue less expenses) was generated by their own agricultural activities. This may seem quite low at first glance, but consider that the smallholder diaries sample in Mozambique is comprised largely of subsistence farmers: they generate very little surplus to sell (i.e. income) and purchase very little fertilizer or pesticide (e.g. expenses), and thus report very low agricultural revenues. But this underplays the importance of agriculture to these households. The sample households in Mozambique grow a lot, consuming it in the household and trading it with neighbors, working outside the cash economy. Thus, factoring in their in-kind consumption of household agricultural production, which the smallholder diaries tracked in great detail, the proportion of household income from agriculture increases to 49 percent.

A study in rural marginal areas of Mexico found that agricultural activities represented about 39 percent of household income and, interestingly, that reliance on agricultural revenues increased for poorer households (World Bank, 2001). This study also included the value of the household consumption of its own food production as part of their agricultural revenue. This is also consistent with the Kenya finding that including the value of goods consumed from the family's own farm substantially increases per capita consumption (by about 29 percent).

Figure 2: Household income from agricultural and non-agricultural production in the smallholder diaries sample: (1) Median number of income sources, (2) Median proportion of total income, and (3) Median proportion of total income factoring in in-kind consumption
June 2014 - July 2015



²² While agricultural revenues in Pakistan can be high, agricultural income is calculated by subtracting farming expenses, which can be substantial, from gross revenue.

Irregular and volatile household cash flows. The share of different income sources in total income varies over a typical year. Seasonal variations, generally more acute for rural households than urban households, underlie most of the unpredictability, uncertainty, and irregularity of cash flows that together constitute the second element of the “triple whammy” described in PoP. For small farmers, the unreliability of income was even more pronounced than for large farmers, as a result in part from their inability to obtain timely funding for farm inputs.

The unpredictability of income creates additional challenges in cash-flow management for poor households. In the absence of formal safety nets (as in South Africa in PoP), unpredictability creates a need for households to constantly be on the lookout for other sources of revenue. In this respect, contributions and remittances from friends and family (“resources received” in the financial diaries) not only represent an important source of income, but also substantially reduce income volatility, from 101 percent to 68 percent (month-to-month) for the mean rural household in the Kenya financial diaries. (The role and effectiveness of formal and informal finance in helping manage cash-flow fluctuations will be discussed later.)

Given the volatility of income, household expenses are (necessarily) rather volatile, and budgeting beyond the short-term involves large “error margins.” The examples of South Africa funeral expenses in PoP are illustrative of how households pool all kinds of outside resources with their own, including drawing down savings and acquiring debt, to meet an important obligation. Accumulating lump sums for specific planned purposes—school, weddings, planting—calls for other means of accumulation. Rural households tend to resort to livestock and other quasi-liquid assets with this purpose. Formal financial instruments, such as commitment savings, are deemed superior substitutes for this kind of assets (more on this below).²³ Resources received in the Kenya diaries play an important role in mitigating how much of the income volatility translates into expense (mainly consumption) volatility in the short run. Yet rural households also do need to plan for lumpy expenses, such as schooling, and be able to manage unexpected lumpy expenses, such as funerals, for which remittances from the social network do not suffice.

Mobile phones and their potential role in household economics

“Mobile banking” or “mobile financial services,” defined as the use of mobile phones to access financial services and carry out financial transactions, will be specifically covered later in this paper.²⁴ This section covers the more basic question of whether mobile phones are accessible and usable for smallholder farmers, which influences the role that they may (and may not) play in household economics. As illustrated earlier, a crucial factor in the ability of rural dwellers generally and smallholders in particular to access mobile phone services is the “connection penetration rate” in rural areas (using GSMA terminology): It does not make much sense to purchase a mobile phone, however cheaply, if it cannot be used.

GSMA reports rural connection penetration rates systematically much lower than urban rates in Sub-Saharan Africa (SSA). Vodacom Tanzania, for example, reported a rate of 25 percent in rural areas compared to 80 percent in urban areas (GSMA 2014b). Therefore, even though SSA has a 65 percent overall penetration rate, and “has been the fastest growing region over the last five years in terms of both unique subscribers and connections” (GSMA 2014a), that growth has been accounted for mainly by urban usage given the low rural connection penetration rates.

²³ See Brune et al, 2011; also Duflo, Kremer, and Robinson, 2009.

²⁴ This is also the subject of a separate paper (Tarazi and Lauer, 2015) prepared for the same G20 roundtable.

Many factors influence the decisions of mobile network operators (MNOs) to expand their service networks. Population density, general literacy, and associated demand for voice/text services, plus the willingness and capacity of governments to provide the basic infrastructure (either as public good or in public-private partnerships), are reasonable propositions to explain MNO coverage decisions.²⁵ Rural smallholders are unlikely to be prime targets for MNOs unless pressure to expand beyond market-saturated urban areas becomes overwhelming or targeted subsidies are in place (e.g., Vodacom Tanzania with a private foundation grant to serve rural areas). As average revenue per subscriber in SSA has fallen sharply between 2008 and 2013, expanding services to rural and low-income segments of the population becomes “a significant challenge for operators” (GSMA 2014a, p. 10).

A related question is whether the advent of advanced devices (smartphones) and associated huge increases in internet-related data usage (mostly urban) may discourage MNO expansion into under-served areas with only 2G capability, and therefore a more limited fee-based usage. Except for MNOs already with a large network, the business case for broadening geographic coverage versus deepening urban services may be less appealing than before.

There is also a gender dimension to highlight: Women in low and middle-income countries are 21 percent less likely than men to own a mobile phone (GSMA 2014b). An emerging rule of thumb is that the rural connection penetration rate in a given country in SSA is roughly one-third of that country’s overall rate. And to estimate women’s access to that connectivity in rural areas, use about three-fourths of the rural connection penetration rate. Relative to SSA, South Asia offers a much more favorable scenario of mobile penetration in rural areas. Table 2 below summarizes findings on mobile phone ownership and access to a mobile phone (one’s own or borrowed) reported for Bangladesh, India, and Pakistan (Sultana, 2014). The similar penetration rates of urban and rural, especially in the “own or can borrow” category, hint at the importance of population density in rural areas, typically much higher in South Asia than in SSA, as a key driver of MNO coverage. The table also shows a gender gap in access to a mobile phones that is much less pronounced than in sub-Saharan Africa, though the gap in ownership is still large.

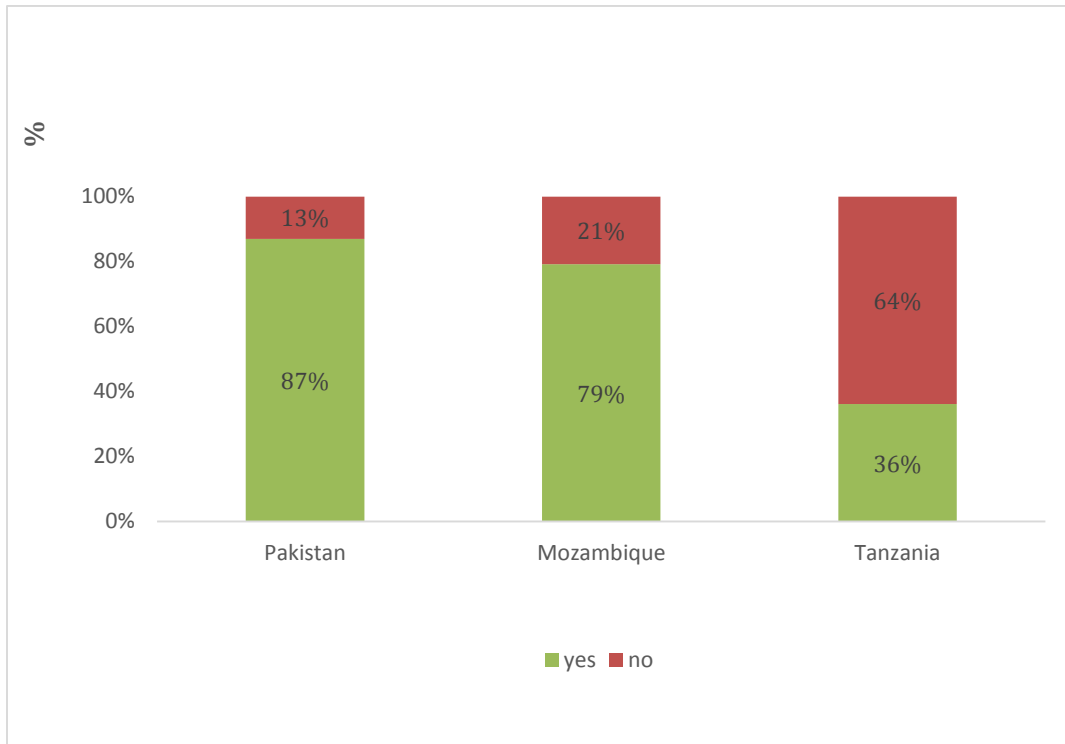
Table 2. Mobile phone access in Bangladesh, India, and Pakistan
Percent of individuals 15 years old and older, 2014

	Total	Urban	Rural	Male	Female
Bangladesh					
Own	58	69	53	72	44
Own or can borrow	95	95	96	96	95
India					
Own	50	64	43	68	31
Own or can borrow	85	91	82	89	81
Pakistan					
Own	59	62	58	80	38
Own or can borrow	80	82	78	88	70

Source: Sultana, 2014.

²⁵ A GSMA report on the Philippines, “one of the fastest growing economies and mobile markets in Asia,” relates the impressive growth of the mobile market to “... a youthful, literate population, a large proportion of English speakers, a rapidly growing economy and increasing foreign VC investment” (GSMA 2014). This sounds almost like a checklist of what smallholder households in SSA are not.

Figure 3. “Have you used (even if borrowed) a mobile phone in the past year?”
 Percentage of respondents in each smallholder financial diaries sample



Results from the CGAP smallholder diaries also indicate very limited mobile phone ownership, usage, and levels of understanding among smallholder households. While the majority of the respondents among the sample in Pakistan owned a mobile phone (84 percent), only around half of the respondents in Mozambique and Tanzania owned a phone (43 percent and 54 percent, respectively). Figures for SIM ownership were similar, although slightly higher in Mozambique and Tanzania, meaning that some households may not own a phone, but they do have access to a SIM card. In the Mozambique and Pakistan samples, most other household members apart from the main respondent did not have phones, though about half of the Tanzanian households did. That said, 64 percent of the Tanzanian respondents had not used a phone—not even a borrowed one—at all in the past year.

Levels of understanding also varied across the smallholder diaries sample; a sizeable proportion of the sample in Tanzania (21 percent) could neither dial the mobile phone nor receive a call or SMS on it. A rather striking finding is that of the respondents with access to a mobile phone, only 43 percent could use SMS functionality or better (i.e., internet) in Pakistan, 42 percent in Mozambique, and just 1 percent in Tanzania. SMS-functionality being crucial for mobile banking, these findings point out the existence of a crucial gap between basic access to a phone and the ability to perform transactions with it.

Table 3. “How well do you understand how to use mobile phones?”
Percentage of respondents in each smallholder financial diaries sample

	Pakistan	Mozambique	Tanzania
I can dial and initiate a call AND receive calls AND send and receive SMS AND access the internet	10%	0%	0%
I can dial and initiate a call AND receive calls AND send and receive SMS	23%	42%	1%
I can dial and initiate a call AND receive calls	34%	25%	59%
I can dial and initiate a call	14%	2%	10%
I can receive calls	9%	30%	9%
I can neither initiate nor receive a call, nor send/receive an SMS	8%	1%	21%

Gender dynamics in household decision-making and finance

“Women perform 66 percent of the world’s work, produce 50 percent of the food, but earn 10 percent of the income and own 1 percent of the property.”²⁶

While the UN statement above quoted in the Women, Business and the Law 2012 report is intended to encompass all sectors of economic activity, the disparities it denounces are perhaps more pronounced in the agricultural sector than in any other sector. Women account for about 43 percent of the agricultural labor force in developing countries, ranging between 20 percent in Latin America to almost 50 percent in Eastern and Southern Asia and Sub-Saharan Africa. That share exceeds 50 percent in many countries, including Mozambique (65 percent), and Tanzania (55 percent). In Uganda it is close to 50 percent, while in Pakistan is about 30 percent. In countries with relatively large populations, the share of women in the agricultural labor force approaches 48 percent in China, 32 percent in India, and 40 percent in Nigeria (FAO, 2011).²⁷

Grounded on legal frameworks that explicitly discriminate against women, especially in using and owning property and accessing institutions²⁸, “[r]ural women’s contributions [to economic activity] are often invisible” (Women’s World Banking, 2014, p. 9). In addition to being the primary caregiver of children, and responsible for the family’s housing, food, education, and healthcare in rural households, women perform a number of income generating activities that are usually undervalued. Women’s World Banking defines three categories for women’s roles in rural households, from contributor to collaborator to sole proprietor (albeit without providing an estimate of the relative importance (in numbers) of each category). One could assume, however, that there is sharp decrease in significance as we move towards the sole proprietorship, where the numbers must be slim and in part restricted by the existing legal context.

²⁶ See Women, Business and the Law (WBL) 2012. Preface. World Bank – IFC, 2011.

²⁷ A recent study (Palacios-Lopez, Christiansen, and Kilic, 2015) estimates generally lower female labor shares in African agriculture, albeit the study restricted measurement of labor input data to crop production, i.e., ignoring livestock husbandry, on-farm processing, fetching wood and water, and other activities typically performed by women in rural households.

²⁸ See WBL 2012, cited above.

The gender gap in financial inclusion of 6-9 percentage points across income groups reported by the World Bank Findex in 2011, remained about the same in 2014 (Demirguc-Kunt, et al 2015). The estimates by gender do not distinguish between urban and rural. The gaps differ substantially across regions, from practically non-existent in OECD countries to the Middle East, where women are half as likely as men to have an account. The gap (in percent of adults) between men and women with accounts in Sub-Saharan Africa is 40 percent of men / 22 percent of women; in South Asia is 60 percent of men / 40 percent of women; and, in Latin America and the Caribbean is 60 percent of men / 55 percent of women.

Studies that have looked at differences between female farmers and male farmers have found lower yields associated with women's plots, explained by limited knowledge of improved cultivation practices, lower land quality, and unfavorable tenure status, a factor that makes access to investment capital difficult. Limited access to finance also affects women's ability to purchase inputs and invest in farm equipment and draft animals. Importantly, women's time to allocate to farming is also constrained by other household obligations such as child care and housework.²⁹

Household age groups and concerns about youth outmigration

An emerging concern in low-income countries is that the rural youth migrate to urban areas (or abroad) and the average age of smallholder farmers keeps increasing. Recognizing this trend, a recent post at the IFAD site highlights promoting entrepreneurship among young people as key to retain them in rural areas by creating new employment opportunities conducive to increased agricultural productivity. On the other hand, Hazell argues that "relatively few workers are leaving their farms for the cities and instead are diversifying into nonfarm activities from a small farm base." (Hazell, 2013, p. 1).³⁰ Where is the next generation of small farmers? And how are rural youth accessing financial services?

The most recent Findex data reports a 10-20 percentage point difference in account penetration between young adults (ages 15-24) and adults 25 and older (Findex 2014). Whether this gap is associated with the concern on youth outmigration from rural areas is hard to tell, since the Findex findings do not distinguish between urban and rural.

In the CGAP smallholder diaries sample, almost all the adults were born into farming households (97 percent in Mozambique, 100 percent in Pakistan, and 98 percent in Tanzania) and began working in agriculture at a young age. Most believe that they will continue to farm, and in many cases will continue to supplement agriculture with other income sources. Looking ahead to the next generation, the majority of Mozambicans want all their children to continue farming (57 percent), while most of the Tanzanian and Pakistani smallholders do not (68 percent and 49 percent, respectively) (see Figure 4). Families that want their children to pursue other activities emphasize that non-farming jobs can provide a steadier or higher income source. It is not surprising that parents want their children to have steady income; this approach is consistent with the evidence over the course of the smallholder diaries that households cannot rely on only one source of income (such as income from crops) to meet their needs and must patch together income from various sources to make ends meet over the course of the year.

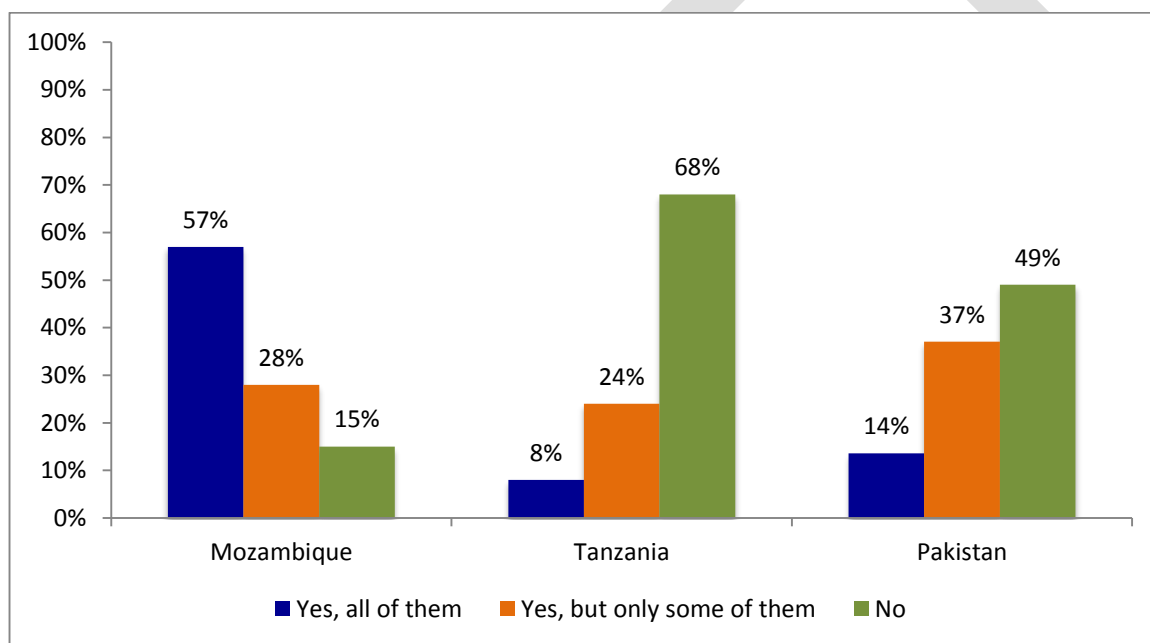
In Mozambique, however, families in the smallholder diaries sample voiced concern with meeting their most basic needs—food and shelter—and appreciate the stable food source that their agricultural activities provide. They see the main advantage of being a farmer as the ability to guarantee a minimum level of food for their family. Few respondents among the sample in Mozambique can envision a life outside of farming, or are attracted to the possibility of moving to the city: Only 35 percent would move

²⁹ Varangis, 2015; unpublished draft.

³⁰ The question came up repeatedly in Uganda (J. Anderson's BTOR May 2015).

to the city, even with no financial constraints on relocating. The thought of not being able to grow their own food, and therefore ensure their family's survival, worries them. Building a sturdy house out of quality materials and improving their farm are the two most important aspirations among the sample of smallholder farmers in Mozambique; education for their children is a relatively lower priority. In the smallholder diaries sample in Tanzania and Pakistan, most respondents also view expanding or improving their farm as a top life goal. Many households in both countries also want to purchase their own farm equipment, educate their children, and support them in achieving their future goals. The desire to support their children while also achieving farming goals underlines the conflict between an interest in finding steadier sources of income but being unwilling to take the risk of leaving farming or unable to finance a new business or other change in employment.

Figure 4: "If you have children, do you want them to continue farming?"



B. Agriculture in smallholder household economics

More than a source of revenue – a distinct livelihood

The importance of agricultural revenues in total household income for smallholder farmers has been discussed above. The importance of farming as a source of food for household consumption was also pointed out, with estimates of its significance from the FSD Kenya Diaries and the CGAP smallholder diaries. What else makes smallholders want to stay in their small farms instead of closing shop, selling out to larger farmers, and moving to town?

Even as labor markets evolve and labor becomes more expensive, thus threatening the comparative advantage of small farms using cheap family labor (Hazell, 2011, cited above), smallholders tend to stay put. One can argue that, in addition to being able to produce their own food, there are other tangibles and intangibles that define smallholder farmer as a distinct, desirable livelihood. In the CGAP smallholder financial diaries, smallholders in Tanzania shared a range of other reasons why they stay put: While they feel that though people in the cities have access to everything, such as health care, education and other social services that are very important, life in the city is full of “bad influences.” In

the rural areas it is “easier to get food” and “everything is cheaper.” Besides, rural areas are “all I know,” as some said. One smallholder in Pakistan explained that non-farming jobs were not guaranteed: “Whether you have a job or not, whether you have a business or not, you can make do with the land.” Another explained that he doesn’t have the skills required for other jobs: “We don’t have another option. I have been doing this work my whole life, and I am an expert in farming.”

The housing value of the small farms is rarely mentioned in the literature, even as one can observe not just one home built on the farm, but several of them as children become adults and establish their own families. Further, the small farm as a base to develop non-farm enterprises as posited by Hazell above would add value to the small farm proposition as a viable entity.

Risk management

Strategies to manage risk are fairly well documented.³¹ The literature on agricultural insurance begins with an assessment of the farmers’ demand for insurance. A critical question in this assessment is whether risk-management methods used by farmers adequately protect household consumption stability and maintain farm productive capacity. If the answer is yes, then the scope for public policies such as crop insurance to help farmers adjust to risk is limited (Walker and Jodha, 1986).³² For the purposes of this paper, it seems useful to distinguish between: (a) Traditional risk-management strategies farmers use without recourse to outside services (meaning beyond the extended family), albeit they involve an implied demand for certain attributes in financial tools; and (b) Strategies that involve an explicit demand for and use of savings, credit, and insurance services. A brief discussion of these two categories follows.

Traditional risk-management mechanisms. Developed over generations, these mechanisms offer a number of advantages by reducing risk and smoothing consumption, but they also have limitations. They may entail income loss, and discourage on-farm investments and adoption of innovative technologies (Skees, Hazell, Miranda, 1999).

- **Crop and livestock diversification**, looking for counter-cyclical net flows. Farmers planting crops with a defined growing/harvest cycle will also keep cattle, goats, pigs and chickens as a way of smoothing income sources and food sources. Crop diversification itself (i.e., planting several crops instead of a single crop or, in some cases, planting the same crop in clearly distinct plots with, for example, diverse expected rainfall) is perhaps the most dominant strategy in risk prevention (Hazell, Pomareda, Valdés, 1986). A main shortcoming attributed to crop diversification is that yields and profits from a diversified crop portfolio are typically lower than those obtained specializing in a single crop (or just a few). For smallholder farmers, diversification has the additional disadvantage that production volumes from each crop are small, hence affecting the farmer’s ability to access markets with a minimal “critical mass” of produce.

Results from the smallholder diaries show that smallholder farmers can and do employ a range of risk mitigation strategies. Most smallholder households in the sample for the smallholder diaries plant a variety of crops, lowering the possibility that all crops will be affected by specific pests or price fluctuations. As seen in Figure 5, the proportion of farmers also practicing

³¹ See for example Skees, Hazell, and Miranda, 1999, on crop insurance; and Mahull and Skees, 2012, on livestock (index-based) insurance. Also, Hazell, Pomareda, and Valdés, 1986.

³² The other question posited by Walker and Jodha refers to the effect of risk-management methods on static and dynamic social efficiency, which (if detrimental), would justify public policy for the sake of social welfare.

intercropping is the largest in Mozambique (87 percent), where diversity in consumption is important.

- **Staggering planting dates.** When possible – especially in irrigated plots – staggered planting dates mean similarly staggered harvest dates, thus mitigating risks such as unexpected drought (or floods, or pests as the case may be) in mid-season.
- **Offsetting price and yield variations with surpluses.** Contingent upon their ability to store produce, and the perishability of the product, and also depending upon their overall cash-flow fluctuations, farmers may be able to manage price and yield variations to reduce income variability. Storage capacity, a major enabling factor for this strategy, is usually a constraint. Using registered warehouses (which may allow for credit access) involves transport costs, warehouse fees, and the need to meet quality standards. An interesting experience evolving in Kenya is the e-warehouse system that records on-site storage and allows its use as collateral against short-term loans.³³

The smallholders diaries sample in Pakistani and Tanzanian reported that a decrease in the price of crops was a major concern. Having as much information as possible about prices can potentially lower this risk. Interestingly, a large proportion of the sample in Pakistan (84 percent), but less than half of that in Tanzania (46 percent) consider they have access to information about prices. Interestingly, both the Pakistani and the Tanzanian sample of farmers reported that their main sources of information about crop prices are agricultural agents and other people in the village, as well as people they talk with in the city or town. In contrast, farmers in the Mozambique sample say they learn about crop prices at the market when they go to buy and sell. Given the distance, poor roads, and cost of transportation, this means that they often will take whatever price is prevalent that day since they cannot afford to go home and return another time in hopes of a better price.

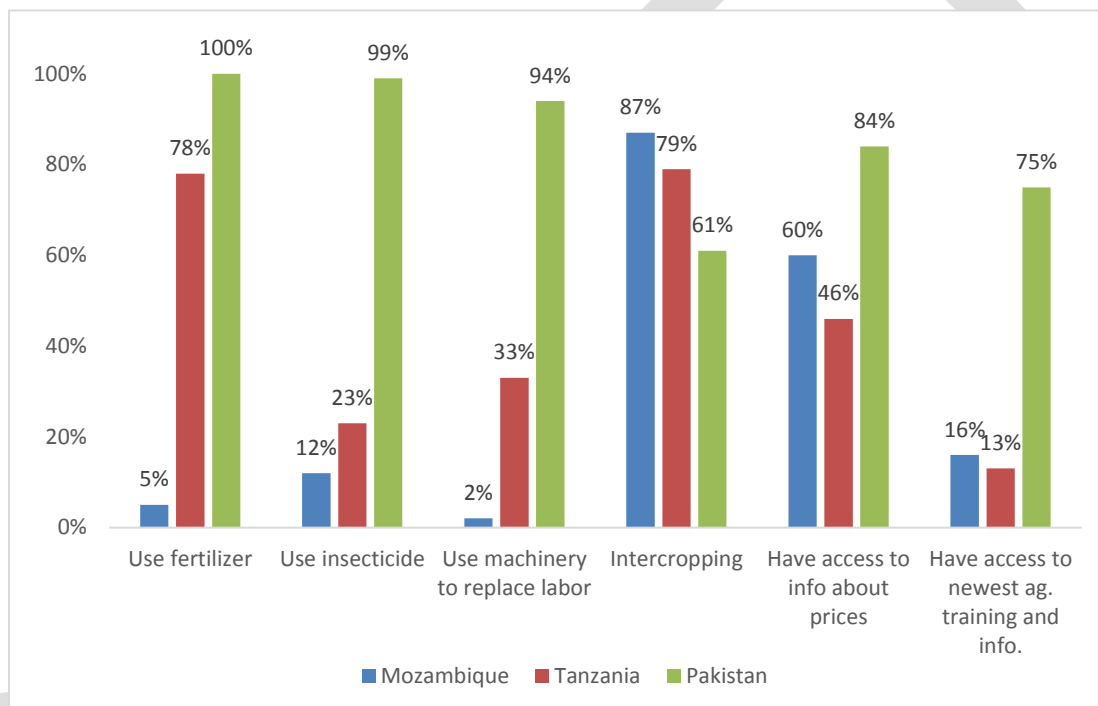
- **Income source diversification** (e.g., non-farm employment). As noted above, off-farm agricultural and non-agricultural employment are important sources of non-farm revenue for smallholder households. Some sources rate “increased labor market participation” as the most important risk-adjustment strategy after crop diversification (Walker and Jodha, 1986). Moreover, wage labor in particular conveys a steady source of income that few farming activities offer, with the possible exception of dairy production and backyard poultry farming (eggs). An important caveat, however, is that the effectiveness of accessing off-farm employment opportunities to offset farm income fluctuations depends to a large extent on the covariance between agricultural and non-farm revenues. Agricultural shocks that affect an entire region will mean that only access to employment in a different region (or country) would be an effective counterbalance.
- **Recourse to family and friends.** The use of resources coming from family and friends in case of emergencies and other lumpy expenses is documented in PoP, the Kenya diaries, the smallholder diaries, and other sources. While not a risk-prevention or mitigation mechanism, it is listed here as a general risk-coping tool.
- **Sale of assets, mainly livestock.** The next strategy in importance after non-farm employment is using livestock as quasi-liquid assets that can be easily converted to liquid assets in order to compensate for crop losses, or face unexpected shocks such as medical emergencies. Stockpiling basic assets, therefore, is the corresponding risk-prevention method. Temporary surpluses are

³³ Grameen Foundation, Farm Concern International, and USAID.

usually “invested” in assets that can be easily liquidated, such as small livestock (e.g., goats, pigs, chickens). The limitations of this strategy stem from the mortality/loss rates associated with livestock, the price disadvantage associated with “emergency sales,” and asset indivisibility – the need to sell the entire pig even if the emergency to cover calls for only half the pig’s value. Other quasi-liquid assets suitable for stockpiling are building materials (e.g., bricks, gravel), firewood, and manure.

- **Tenancy and other risk-sharing arrangements.** Perhaps not that relevant for subsistence smallholder farms, tenancy contracts involve some form of risk sharing between landlord and tenant that somehow works for both parties.

Figure 5. CGAP smallholder diaries: Reported risk mitigation strategies



Managing risk using financial services. Using financial tools such as savings, credit, and insurance products in conjunction with traditional methods of risk management is arguably a more comprehensive and preferred overall strategy for those farmers with access to those services. While financial services are covered in more detail later in this paper, two points are highlighted here, given their connection with risk management.

- **Savings and insurance.** Poor households hesitate to commit their limited cash-flow surpluses to insurance premium payments for the coverage of relatively low-impact or unlikely risks (i.e., with low expected losses). They prefer to keep those funds in liquid or quasi-liquid assets that have multiple uses. The low uptake of non-life insurance in low-income countries is usually attributed to this preference.³⁴

³⁴ See for example Armendariz and Morduch, 2010.

- **Crop/livestock insurance.** A separate topic on its own with abundant literature, crop insurance, including index-based insurance, has a mixed record in low-income countries. This is in no small measure due to the tendency of governments to intervene in the presence of systemic shocks, such as droughts, floods, or pests, and totally or partially relieve farmers of all obligations (interest and principal) vis à vis their creditors. The incentives for farmers to purchase insurance are therefore minimal. The case for financial institutions to purchase index-based insurance has been convincingly made by Mario Miranda (Ohio State University), since their non-performing loans would drastically and almost immediately increase in the event of systemic weather-based shocks.³⁵ The smallholder diaries reported no use of insurance across the sample in Mozambique, Tanzania, and Pakistan.

Connection to markets, downstream and upstream

Documenting the extent and quality of market linkages associated with different crops and livestock, and the size of the farm is essential in a segmentation exercise designed to make the broad definition of a smallholder more granular. A recent study of smallholder coffee growers in Uganda provides an illustration of how even within the specific category of coffee growers, farm size, the availability of off-farm employment, and the relative contributions of coffee and banana production to farm income result in different constraints and opportunities to adopt agronomic recommendations (Bongers et al, 2015).

The transition from staple/food crops to cash crops, driven by technology or demand, is also important in this respect, and makes connection to markets even more impactful. An example of this evolution is the now standard practice of brewing beer from sorghum. Albeit not a new approach—a 1999 paper talks about the potential of sorghum as an alternative to barley in beer brewing in the tropics³⁶—it appears that varietal issues have been solved and breweries in Africa are actively demanding, and contracting for, sorghum grain.³⁷ Another example is the effect of regional integration in East Africa that has resulted in food crops typically grown by women for household consumption acquiring new commercial value as cash crops (J. Anderson’s BTOR, May 2015). In Ethiopia, the relatively recent evolution of teff from a basic staple to an export crop, driven by demand for gluten-free, healthy foods, is another example.

Value chains, multiple and diverse

Connections to markets—downstream (producers towards consumers) and upstream (producers to input suppliers)—are also generically referred as value chains, or supply chains. Their categorization as “tight” or “loose” depends upon the strength and reliability of linkages between participants in the value chain (see Christen and Anderson, 2013). At one extreme there is full vertical integration where the ultimate buyer owns the production capacity and everything in between – e.g., the broiler industry – while at the other (loosest) end there is a spot market where producers sell to several and changing traders. Most value chains are somewhere in between (see Figure 6). Farm size matters to some extent, in the sense that buyers will prefer to purchase large quantities from a single producer rather than making many purchases of small volume, but aggregators of different scale manage to work with large

³⁵ Mario Miranda. Presentation at a Bill & Melinda Gates Foundation workshop, 2010. See also Collier and Skees, 2014.

³⁶ Owuama, 1999.

³⁷ This was conveyed by an African banker at a recent conference (AgriFin Forum 2013).

numbers of smallholders in many instances. For example, about 70 percent of the milk marketed in Pakistan (mainly by smallholders) is collected by small-scale collectors in motorcycles (*katcha dodhies*).³⁸

Using the value chains as a mechanism to finance smallholders and eventually to provide them with a full suite of financial services and products (e.g., payments, transfer, deposit accounts, bill payments) is becoming increasingly prevalent among leading banks in developing countries. The so-called value chain finance (VCF) approach is arguably a highly cost-effective way of reaching smallholders that uses existing information in the chain, usually collected through repeated transactions with a processor or large aggregator, to allow reduction in lenders' transaction costs, and enable risk sharing and cost/revenue sharing arrangements between banks and downstream participants.³⁹

The sample of Pakistani households in the smallholder diaries is part of a complex value chain that includes informal agricultural agents known as *arthis*. Families are able to obtain farming inputs on credit through their long-standing relationships with an arthi, and then they sell most of their production to these same middlemen. In many cases, the arthi also acts as a kind of informal bank: he can store a portion of the family's savings and provide credit for non-farming expenses like home improvement or weddings. The arthi keep ledgers with the saved amounts, though record keeping is not always clear.

Working with an arthi does allow smallholders to offload the risks of not finding buyers when needed and that the price will decrease, but families may also be under pressure to sell their agricultural output right after harvest, when prices are lowest. The arthi may be eager to obtain his repayment, and some families report being "bothered" by the arthi to repay, which some families believe has a large impact on their income. As one smallholder explained, "After we cut the crop, we sell right away. We have to return the credit to the arthi. Because of this helplessness I have to sell. And sometimes the selling price is low and we suffer a loss [financially]." Often after selling to the arthi and repaying their debt from the previous season, families borrow again right away to finance inputs for the upcoming season, fuelling a perpetual cycle of debt.

Information value of transactions

Building a "transactions history" for smallholder farmers that serves as screening information for financial service providers (FSPs), and makes unsecured lending more likely is deemed a priority for many practitioners in smallholder finance.⁴⁰ Since credit information systems (credit bureaus) work on the basis of loan repayment records, they are obviously not useful for potential smallholder clients who have never used a formal loan.

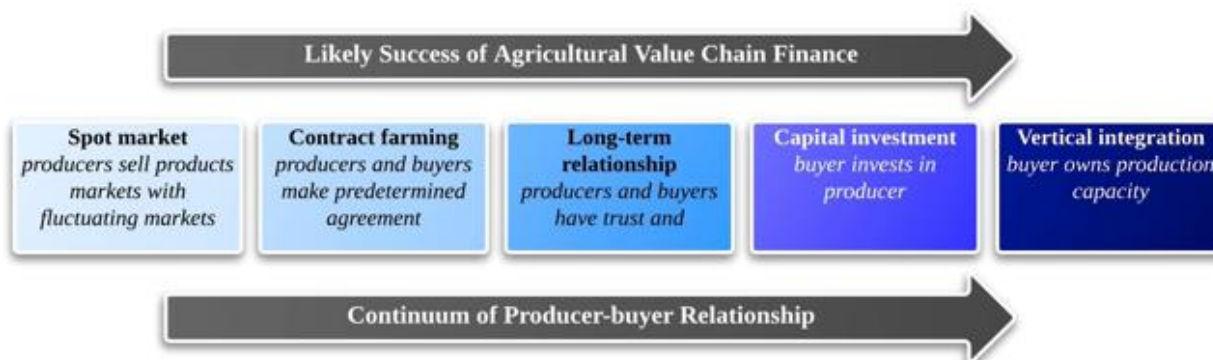
A recent CGAP paper on the use of mobile-phone transaction records (e.g., airtime purchases, payments) as useful data to assess reliability and credit risk associated with clients for whom no credit information exists, points to the potential of digital data as an enabler of financial services for currently un-served populations (other than money transfers). In fact, M-Shwari, a digital savings-and-loan product launched by the Commercial Bank of Africa and mobile operator Safaricom in Kenya, uses mobile phone records to establish and adjust credit limits. The extent to which the innovation will reach rural and smallholder segments will clearly depend on the extent to which mobile phone service, including money transfers, is viable for those segments.

³⁸ AgriFin case study. 2015. Unpublished.

³⁹ A comprehensive VCF review and Guide prepared by AgriFin in partnership with leading bankers is forthcoming ("Agricultural Value Chain Finance. A Bankers' Guide." Expected September 2015).

⁴⁰ This was brought up repeatedly in Uganda (J. Anderson's BTOR, May 2015).

Figure 6. Continuum of relationships between producers and buyers in agricultural value chains



Source: Agrifin Bootcamp training, 2014.

Transactions information in agricultural value chains, including product delivery in contract farming and compliance with delivery contracts to processors, is usually compiled by aggregators and processors. The value chain finance approach referred to above allows FSPs to “mine” that information and set up cost/revenue/risk sharing partnerships with agribusiness firms supplied by smallholders. A bank in Mexico, for example, uses information from the sugar mill about small cane growers, and the processors’ loan administration services to deliver funding to thousands of producers. The latter gain access to reliable financing in terms more favorable than those previously offered by the aggregator/processor, and establish accounts with the FSP for other services, such as deposits, money transfers, and bill payments. The bank and the processor structure a risk- and revenue-sharing arrangement, where the processor provides a first-loss guarantee and receives a commission for the administration of the loan portfolio. The funding of producers is thus taken off the processor’s books, and passed on to the bank’s portfolio.

C. Financial services for smallholders

Demand for financial services is a derived demand from all smallholder economic activity

The financial lives of the poor, well documented in PoP and the Kenya financial diaries, are intense and active. The CGAP financial diaries with smallholder households build on this foundation and sharpen the perception of how the financial lives of families engaged in agriculture differ from their rural neighbors who are less engaged in agriculture. Smallholders in particular could be seen as constantly balancing the cash flows associated with their multiple sources and multiple uses of funds, while ensuring that certain known uses such as daily consumption, planting, purchasing inputs, and schooling are met on time. In short, the financial lives of smallholder families are even more volatile and more cyclical than other rural dwellers, and they are relying on even fewer financial tools to cope.

Net deficits in those fluctuating cash-flow balances generate demand for external funding by smallholder households once their own “reserves” in any form of savings are exhausted, be it remittances from relatives (resources received in financial diaries terminology), or borrowing. The latter, for smallholders, is mainly from informal sources, such as moneylenders, landlords, or group-based organizations (such as Accumulating Savings and Credit Associations, ASCAs). Friends and relatives could

also be sources of informal loans, albeit terms vary and are usually based on implicit future reciprocity. So, being able to receive money and transfer it back is a clear demand derived from net deficits. Accessing loan products of different kinds is also a demand that emerge from net deficits.

The smallholder diaries also show that the sample of smallholders in all three countries overwhelmingly relies on informal savings tools. Cash kept in the house is the most important savings method for the majority of farmers in Mozambique (88 percent) and Tanzania (58 percent), and for nearly one-third of farmers in Pakistan (31 percent). In addition, in Pakistan 40 percent of respondents save money by keeping livestock and 21 percent report that money guards (usually arthis) are also important. In Tanzania, 22 percent of the smallholder diaries sample uses crop storage as a form of savings. In Mozambique, other ways of savings besides keeping cash at home are almost non-existent.

For the smallholder diaries in Mozambique, Tanzania, and Pakistan, usage of credit varies across the sample. In Mozambique, the sample of largely subsistence farmers had limited access to credit: only 5 percent had an outstanding loan with an informal savings and credit group or financial institution. In Tanzania, more than 60 percent of the sample borrows from friends and family and informal groups. The sample in Pakistan is highly dependent on credit, especially to get through the summer and winter months when agricultural expenses are high; virtually all households in the sample use credit from family and friends, (99 percent), arthis (97 percent), and local stores (94 percent) to make ends meet. Over the year of data collection, households in the Pakistan sample obtained goods on credit from an individual store an average of 14 times.

Table 4. Reported first and second most important methods for saving and borrowing money
Respondents in each smallholder financial diaries sample

	Most important	Second most important
Saving or storing money		
Mozambique	Keeping money at home	ASCA
Tanzania	Keeping money at home	Storing harvests
Pakistan	Livestock	Keeping money at home
Borrowing money		
Mozambique	Friends and family	Never borrow
Tanzania	Friends and family	Informal groups
Pakistan	Friends and family	Agricultural agent

Friends and family are the most important resource for borrowing money, as reported by 68 percent of the smallholder diaries sample in Mozambique, 67 percent in Tanzania, and 72 percent in Pakistan. The arthi, however, is rated as most important by 19% of respondents in Pakistan, while in Tanzania 22% of respondents use informal groups, such as ASCAs and ROSCAs, as their second-most important source of credit. Interestingly, 19 percent of respondents in Mozambique report that they never borrow, which likely indicates a lack of convenient ways of borrowing, rather than a lack of need.

On the other hand, net temporary surpluses involve demand for safekeeping, reliable storage of liquidity, or investments in assets that could be easily liquidated if the need arises. As the diaries have shown, some people do not prefer to keep a lot of cash available; they'd rather "keep the money working." Setting aside some liquid savings for immediate consumption purchases, they prefer to have

their savings working, purchasing durable goods or physical assets, or finding a place for a pot of funds they want to see accumulating with a target purchase in mind, such as a motorcycle, or a rickshaw. Participation in ROSCAs is often associated with target spending. As the Kenya diaries conclude, there are trade-offs between ensuring short-term liquidity and making long-term investments. Keeping savings in illiquid but easily “liquidable” assets, such as livestock or inventories, is a common solution, in the absence of reliable, accessible formal savings instruments.

Table 5. Liquid and quasi-liquid assets as a percentage of total assets*

Assets	Mexico, rural	Malawi
Non-Monetized	77.1	88.0
Monetized	22.9	12.0
• Formal	9.8	3.4
• Informal	13.1	8.6
• Of which, cash at home	7.8	3.0

* Total excludes fixed and low-liquidity assets (housing, land, equipment)

Sources: Mexico, World Bank, 2001; Malawi, BFA, 2011.

Table 5 illustrates a rather typical allocation of asset portfolios among smallholders. Non-monetized assets are comprised mainly by livestock, inventories, and “receivables” associated with loans to others and contributions to ROSCAs. In the Malawi case, the intention to liquidate was an explicit question posed to respondents. As discussed below, the challenge to create attractive deposit instruments for poor smallholders is to make available products that resemble their customary way of investing in quasi-liquid assets but improve upon these in at least one feature: safety, liquidity, or return.

It must be noted that cash accounts represent a very small share of liquid and quasi-liquid assets, a finding consistent with the PoP and Kenya diaries findings. Efforts to make cash transfers more effective, reliable, and less costly, such as through mobile phones, are touching on a small fraction of smallholders’ asset holdings. The challenges remain to devise financial instruments that increase the monetized portion of smallholders’ assets while reducing risk and transaction costs.⁴¹

The supply side – third component of the “triple whammy”

“The third part of the triple whammy is that existing financial instruments are not well-suited to address either [low income or irregular cash flows]” (Collins et al, p. 52). In PoP, diary households relied almost exclusively on the informal sector for all their intermediation needs. Even when microfinance institutions (MFIs) were pervasive, as in Bangladesh and South Africa, their share of transactions carried out by diary households was low (15 percent of turnover, 13 percent of financial assets, 21 percent of debt in Bangladesh, with comparable shares in South Africa).

For all its convenience, informal finance is far from fully adequate, and in some settings not readily available to smallholders. Only 5 percent of the smallholder diaries sample in Mozambique borrowed from an informal group, compared to 62 percent in the sample in Tanzania. Limitations highlighted in PoP include unreliability, lack of privacy, and lack of transparency. Typical ways for smallholders to keep quasi-liquid assets, such as contributions to ROSCAs, loans to others, or short-term investments in

⁴¹ The “Amret solution” documented by CGAP is a good example of how to convey the “in-kind equivalent” of a commitment savings account by showing how much of a real cow the account has accumulated at any point in time. CGAP applied product innovation work with smallholder households, in progress.

livestock are exposed to default and losses. Desertion in ROSCAs, late repayment of informal loans, and high mortality/thefts of small livestock are common, as Tables 6 and 7 demonstrate.

Table 6. Maturities, risk and average balances in informal financial savings

Form of savings	Average maturity (months)	Rate of non-recovery (a)	Average balance (1999 pesos)
Tanda (ROSCA)	4.54	0.06	1,940.49
Moneykeeper	1.30	0.00	1,600.84
Informal loan	3.45	0.21	761.61

(a) Percent of respondents reporting difficulties in recovering their money

Table 7. Maturities, risk and average value of livestock

Livestock type	Average maturity (months) (b)	Average mortality rate (%)	Average sale value (1999 pesos)
Pigs	6.93	40.00	1579.00
Chickens	4.43	56.00	337.26

(b) Months animals were kept by the household

Source: World Bank, 2001

MFIs mainly in South Asia and in Latin America have introduced “cash-flow friendly” lending mechanisms that allow for small and flexible payment schedules. Adaptation of these mechanisms to rural settings where cash flows could be even more volatile, and where large lump sums can be needed or received associated with crop cycles has been introduced in some MFIs (IFC, 2014). In Bangladesh, BRAC launched a new agricultural loan product with a repayment schedule tied to harvest, with one-third payable at the first harvest, one-third payable at the second harvest, and the remainder spread over 12 monthly installments. But defaults went up and farmers complained: Major (lump-sum) loan repayments were due just when prices were lowest, forcing farmers to sell at a loss and leaving them with little revenue after a season of hard work, while they had other sources of income that would allow them to service their debt over time. BRAC changed its repayment schedule in 2012 to 12 even installments, eliminating the large payments at harvest time. Overall repayment performance improved as a result.

Bank credit to smallholders has been historically very limited. Short-term credit secured with fixed property is the traditional product some smallholders can obtain as long as they have title on the fixed property. Use of movable property and receivables as collateral, including warehouse receipts, is still highly limited by legal systems that do not enable such contracts. Factoring (of receivables) and leasing are still difficult to implement in many countries that lack the appropriate legal environment. Further, even when legal systems are conducive to using these collateral substitutes, banking regulations may maintain provisioning and risk-asset weighting rules on loans not secured with fixed property that impinge upon banks’ willingness to lend against movable property and receivables, arguably the most accessible types of security for smallholders.

Product-linked financing is feasible in well-structured value chains where the off-taker/aggregator (buyer) assumes the role of bank agent. The quality and stability of the relationship between the off-taker/aggregator and the smallholder producer (supplier/seller) is likely to be reflected in the terms and conditions of the producer contract and bank financing for both producer and aggregator. The so-called

“golden handcuffs” depicting the smallholder producer as a disadvantaged partner needs to be evaluated against the expanded outreach of formal finance that the value-chain arrangement entails when buyers are indeed expanding the reach of FSPs. The smallholder-arthis relationship in Pakistan is a good illustration of the trade-offs associated with this kind of links between smallholders and buyers (see Box 3). Ahmed (2015) rightly points to making financing available to the arthis system, and inducing a more transparent arthis-farmer relationship as valuable strategies for expanding outreach to smallholders and improving the quality of that relationship. Otherwise, warehouse receipts, factoring of receivables, and other forms of financing commercial smallholders are feasible options, provided the legal and regulatory framework is in place, and that information flows among the parties are smooth and transparent.⁴²

Box 3. Smallholder-arthis relationship in Pakistan

“Arthis” are traders/agents who conduct business in specific locations on a regular basis (see section on value chains above). They are a part of smallholders’ financial lives, with arthis-smallholder relationships usually running through several generations. Arthis purchase crops, and in the process serve as a “personal bank” for smallholders by providing inputs on credit, and serving as moneykeepers for smallholders’ savings.

While farmers see some issues in dealing with arthis, such as timeliness of funding, they seem to appreciate the flexibility of the financing arrangement, i.e., repayment after harvest, and soft rules in case of a bad crop year. An interesting follow-up case study would be to look at arthis and “katcha dohdhis” milk collectors as important links in Pakistan smallholder value chains, and ascertain their potential role as generators of transactional information for smallholders.

Source: Ahmed, W., 2015, and AgriFin. 2015.

Financial products and services

A useful construct to conceptualize financial products for the poor is that “the poor want to store, transfer, secure, and build financial value” (J. Firpo 2015 PPT, slide 5). The attributes of financial products and services for smallholders must translate into those desirable properties, to which one could add the consideration of risks. A financial product or service could then be rated by scoring how well it meets standards as a:

- Secure store of value;
- Source of liquidity;
- Risk mitigation tool; and/or,
- Means of payment and/or transfer.

A necessary addition to this framework is transaction costs. Both the delivery of products (making the product or service available), as well as the uptake and usage by smallholder clients entail transaction costs for the respective parties. Minimizing these costs is essential for delivery to be sustainable, uptake to be expeditious, and usage to be active and growing.

Delivery, uptake, and usage costs need to be such that the product or service is effectively used. The distinction between uptake and usage is important. The experiences of the (mandatory) “no frills” accounts in India and the “Mzansi” accounts in South Africa illustrate the large proportion of accounts that become dormant in a relatively short period when they cannot be used for much other than receiving payments, or when such usage becomes expensive for low-income account holders. In South

⁴² See note above on storage capacity and e-warehouses.

Africa, the percentage of “banked” adults increased from 46 percent to 63 percent in the four years after the Mzansi accounts were launched in 2004. That said, 42 percent of the accounts opened at the private banks had become inactive by 2008 (including dormant accounts defined as having no client-initiated activity in 12 months and closed accounts) (BFA, 2009, FinMark Trust).

Mobile banking

Mobile money accounts are not beyond the same disconnect between uptake and usage. GSMA reports that just about 30 percent of registered mobile money accounts were active in June 2013 (i.e. having performed at least one transaction within the last 90 days) (Pénicaud and Katakam, 2013). Moreover, while the number of registered mobile money accounts shows substantial growth between 2010 and 2013, the trend for active accounts is much less impressive (see Figure 7).

The smallholder diaries also document the usage of mobile money among the sample. Almost all of the smallholders in the Pakistan and Tanzania sample had heard of mobile money (97 percent and 100 percent, respectively), but less than a third (32 percent and 27 percent respectively) used accounts to receive or send money. In Tanzania, 31 percent used someone else’s mobile money account for P2P transfers. In Mozambique, some households had heard of mobile money products (20 percent), but usage was nonexistent.

An important consideration when looking at mobile banking is that owning (or having access to) a mobile phone is just one-third of the story. As explained in Lauer and Tarazi (2015), two other components are required: 1) Agents, i.e., a cash-in and cash-out place, be it individuals (MNO agents), retail stores, or small, local shops; and 2) A digital transactions platform that enables and executes the digital transfers initiated (or received) by the mobile device, and connects them to an authorized bank or non-bank value storage.⁴³ Usage of a mobile banking account may depend heavily on whether these two components are in place. The experience of UTL in Uganda helps illustrate this point (see Box 4 below).

Box 4. Learning by doing: Uganda’s UTL experience

Uganda Telecom (UTL), a smaller MNO in Uganda, has experimented with a few pilot approaches to reach smallholder households and agribusiness. To that effect, it launched “M-Sente,” a USD based mobile wallet.

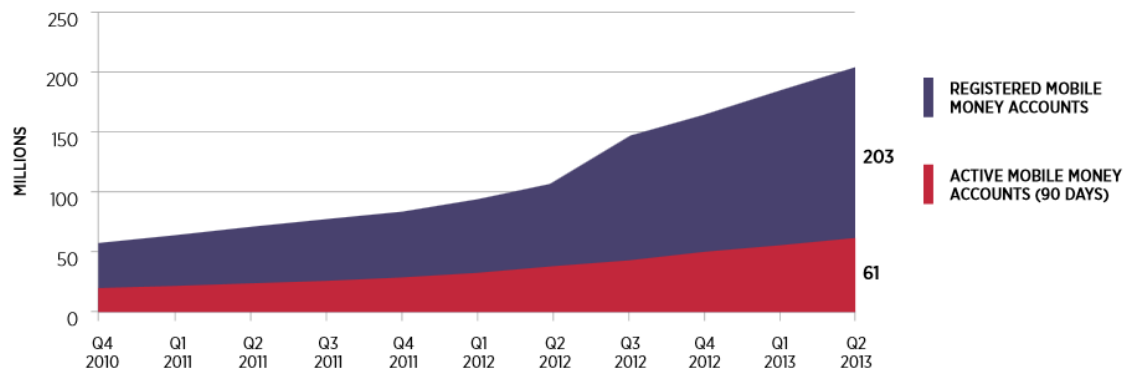
A first experiment, partnering with the Uganda Coffee Farmers Association, aimed at reducing the delay in paying farmers for their coffee (usually eight to ten weeks) and minimizing the need to handle cash. In the one cooperative chosen for the pilot, only one-third of the 500 farmers/members had a mobile phone, and only about two-thirds had ever used it to make a financial transaction. Moreover, the cooperative had no computer, no internet access, and weak mobile connectivity. From the trilogy mentioned above - mobile, agent, and platform – only the agent (the cooperative) was there, while the mobile phones and platform (including signal strength) had to be patched up. Even then, 200 of the 500 farmers registered with M-Sente, and only 50 payments were made in the first attempt.

A second pilot with the Sugar Corporation of Uganda worked much better because the business had access to a working computer and the internet. In addition there was an ICT graduate in the circle of employees and their families who provided key support. Given that about one-half of the employees did not have a phone, offering low-price phones helped to get most everyone on board and fully “mobilize” salary distribution through M-Sente.

Source: Anderson, 2015 Uganda BTOR.

⁴³ See Lauer and Tarazi, 2015.

Figure 7. Number of registered and active (90 days) mobile money accounts worldwide (June 2013)



Source: Pénicaud and Katakam, 2013. GSMA.

Delivery mechanisms and innovations

As indicated earlier, informal finance mechanisms dominate the supply landscape for smallholder households. In the formal market, agricultural credit as proportion of total bank credit to the private sector is about 7 percent in Uganda, and even less than that in both Tanzania (6 percent) and Mozambique (5 percent).⁴⁴ It is safe to assume that this credit goes primarily to commercial large farmers and agribusiness.

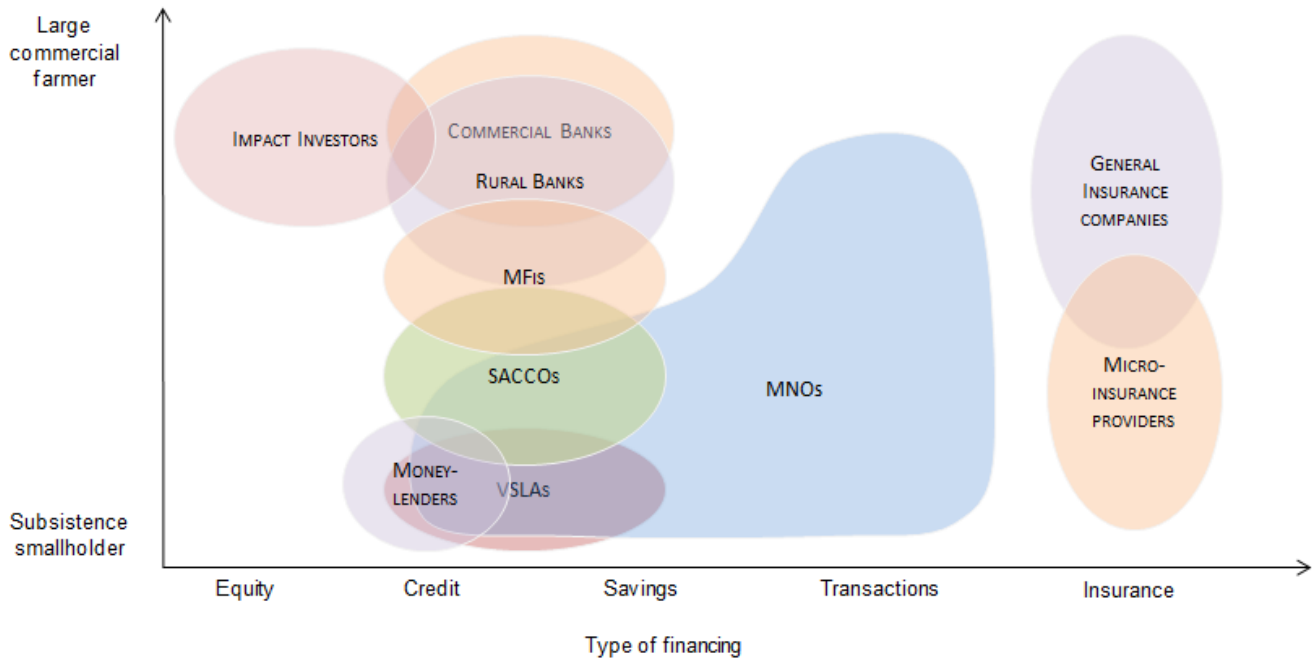
Conventional wisdom suggests that a number of different providers are associated with the different client segments, from subsistence smallholders to large commercial farmers. Figure 8 from Nathan Associates illustrates this point, including the “type of financing” as a categorizing factor, and introducing the mobile network operators (MNOs) as providers of transactions services and, to a lesser extent, savings and credit. The limitation of this presentation is that the sizes of the different “bubbles” are unknown, and perhaps a bit misleading (especially looking at insurance services). For the mainstream services of savings and credit, the progression from mostly informal sources (moneylenders and VSLAs) for subsistence farmers to commercial banks for large commercial farmers, with SACCOs and MFIs in between, reflects what most rural finance compilations convey.

Of the relatively recent developments in inclusive finance in low-income countries, agent banking and electronic banking (mobile and card-based) are likely to especially benefit smallholder households, given the effect these developments have on transactions costs of both delivery and usage. Further, the interaction of these developments with the advent of value chain finance creates an enabling environment for cross-selling of services, a factor especially appealing to suppliers that compensates for the lowprofitability of certain services such as credit, with revenue from fee-based services such as bill payments and money transfers.⁴⁵

⁴⁴ Nathan Associates, 2015.

⁴⁵ A leading value-chain finance bank in Mexico articulated this advantage by underscoring that smallholder farmers receiving value-chain credit would go back to being “financially excluded” once the loan was repaid; hence the importance of making other services available to them via agent banking, the agent being the agribusiness partner or another suitable agent, for the client to remain “included.”

Figure 8. Financial service providers for farmers by type of financing



Source: Nathan Associates, 2015.

While no hard evidence seems to be available to verify the effects on smallholder access to finance of agent banking developments, such as in India (banking correspondents) or Mexico, one could expect that smallholder families are better off as a result of these developments.⁴⁶ Proximity does reduce usage costs. The question of “trust” still remains a critical factor in smallholder farmers’ decision making about financial transactions. Regulatory reforms in both India and Mexico that require agents to meet certain standards are conducive to create an environment of trust that potential new clients appreciate.

Bundling finance with other services

The complementarity (or lack thereof) of finance with non-financial services has long been a matter of debate. At one end of the spectrum, there have been the “minimalists” such as the ACCION International group lending programs in Latin America and elsewhere in the early 1990s that would exclusively focus on credit, with no other services included in their work with the groups; at the other end, a number of combined or bundled programs that encompass credit and education/literacy, health, and/or technical assistance have tried to make the point that credit only is not sufficient to alleviate poverty among the target groups. BRAC and many Grameen style interventions are examples of this model.

⁴⁶ See Dias, Staschen and Noor, 2015, for a review of supervision issues associated with agent banking.

Box 5 summarizes the current thinking on what works in financial education. Relatively recent programs, such as One Acre Fund and myAgro, focus primarily on “in kind” finance in the form of improved seeds, fertilizer and other inputs, and technical advice directly connected with the crops/livestock being funded (targeted training, and linkage to products and services in Box 5). With bundles that include income protection and crop insurance, and involve active vendor participation (myAgro), these programs have shown promise in their initial stages. Questions of scalability and sustainability remain to be explored and documented.

Box 5. Current thinking on financial education

Below are highlights of a recent summary prepared by Nathan Associates based on the World Bank’s Financial Development Report 2014:

- Targeted training works better than broad literacy and education. Traditional education approaches lack long term effects on financial inclusion.
- Financial education is more effective when linked to products and services. Being able to practice what is being taught makes a difference for the trainees.
- Rule of thumb advice is more effective than standard accounting training for small businesses
- “Teachable moments” such as starting a new crop, or buying a major financial product make for more receptive listeners.
- Social networks, such as family and friends, can be a major source of information on financial products.
- The effectiveness of soap operas and other “edutainment” in improving financial education is yet to be determined.

Source: Nathan Associates, 2015.

D. Concluding remarks and implications

The paper has provided an overview of the “state of knowledge” in smallholder farmer status, behavior, and connection with financial tools, informal and formal. Some implications for both policy makers and practitioners are outlined below.

Policy makers

Smallholder families are crucial targets in poverty alleviation interventions. Understanding the segments inside the general smallholder category is essential to design effective interventions. This review, and preliminary findings from the smallholder financial diaries, suggest that: (a) categorizing smallholders is highly context specific; (b) relying primarily on land area as a segmenting variable can be misleading, and a poor predictor of the ability of the smallholder farmer to have a marketable surplus; (c) access to markets and interactions with local traders of inputs and outputs are important factors in the financial lives of smallholder farmers. A clear understanding of these day-to-day relationships, and the opportunities they may entail for innovation in financial transactions and the generation of reliable information, seems a logical next step in gathering intelligence to address smallholder finance.

Financial services can help in different ways to improve smallholders’ wellbeing, yet making them available and affordable to the rural poor is difficult. Agent banking and mobile banking seem to be preferred avenues, but these mechanisms face limitations in rural areas that urban-focused policies tend to ignore. Policies that attempt to improve the use of mobile banking among smallholder households need to address severe rural-urban discrepancies in access and effective usage. This paper finds, both in existing literature and in preliminary findings from the smallholder diaries, that poor signal coverage of mobile networks and low connection penetration rates, especially for women, are prevalent

in rural areas. Further, there seems to be an important gap between basic access to a mobile phone and the smallholder user's ability to perform transactions with it (using SMS functionality).

Much is also yet to be accomplished in improving the enabling environment. Legal and regulatory frameworks ought to enable the use of movable property and receivables as collateral, provide for reliable agent banking mechanisms that make service delivery sustainable and their usage affordable and practical, and allow for expeditious contracting and contract enforcement. Supporting innovation with smart subsidies remains an open door for market-friendly government interventions.

Financial service providers

A number of innovations are being tested, and new approaches are emerging that could sustainably reach smallholders and the varied segments that comprise this enormous client group. "Keep your eyes open" is the main message from this review. The points above on categorizing smallholders are particularly relevant for FSPs as well. FSPs serving smallholders either directly or through value-chain finance approaches will benefit from the financial diaries findings as these provide new insights on the attributes smallholders value in financial products and services. The ability of FSPs to cross-sell, in particular, could be substantially enhanced by the refined knowledge emerging from the diaries.

Information technology is increasingly making a difference to reduce transaction costs in the "last mile" of service delivery. Introducing technology further upstream, e.g., digitizing supplier delivery records at the off-taker/aggregator level could make an even more impactful difference in terms of profitability and portfolio expansion. Like all the innovations outlined here, successful applications of technology are rooted in understanding consumer demand, and in this case carefully differentiating among 500 million smallholder households and their specific demands for financial tools.

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