CGAP

FOCUS NOTE

Early Insights from Financial Diaries of Smallholder Households

No. 102
March 2015

Jamie Anderson
and
Wajiha Ahmed

Renato and Hecinta are raising six young children in a rural area of Mozambique's northern Nampula Province. On just half a hectare, they grow rice, maize, beans, cashew, peanuts, cabbage, and tomatoes, selling what they can and eating the rest. But, like many of the 475 million smallholder households worldwide, agricultural production is just one of their many income-generating activities. They balance several sources of income, within and outside of agriculture, while juggling a range of family needs and using an equally diverse portfolio of financial tools.[1]

Smallholder households like Renato and Hecinta's represent the largest global segment by livelihood of people living on less than US$2 a day. They are a financial inclusion imperative, facing a unique set of financial needs that are not yet fully understood and are far from being met. Smallholder families have specific financial needs arising from agricultural production that are complicated by a number of factors: income from farming is often erratic and infrequent; agriculture requires costly inputs and investments at specific times of the year; and families involved in farming are exposed to risks from pests, droughts, floods, and other environmental shocks. However, smallholder families have other financial needs as well, particularly since very few of them are able to earn enough from agriculture alone. Most households typically earn income from a variety of nonagricultural sources as well, including the sale of their labor and management of off-farm enterprises. Smallholder households are also consumers, giving rise to a yet another set of financial needs, as they manage common issues such as paying regular expenses, covering school fees, responding to emergencies, and financing family milestones such as weddings.

Renato and Hecinta's household is part of the Smallholder Households Financial Diaries project (the "Smallholder Diaries") launched by CGAP in June 2014.[2] The Smallholder Diaries are designed to enhance the understanding of the financial lives of smallholder families by capturing the cash flows of 270 households in Mozambique, Tanzania, and Pakistan over one year of their lives. At the end of the research, the extensive data will generate a balance sheet for each family that details all their sources and uses of income, highlighting the interplay among cash flows, the role of in-kind agricultural income, the financial tools in use, and the pain points where additional or improved financial tools could add value.

The Smallholder Diaries will provide a holistic picture of the financial lives of smallholder households not only as agricultural producers, but also as consumers, laborers, and off-farm entrepreneurs. The ultimate goal of this research is to translate the insights from the Smallholder Diaries into financial tools and provider practices that more effectively respond to the needs and preferences of this important client group. Drawing on initial data, this Focus Note shares early insights from the Smallholder Diaries, providing a first look at how smallholder households weave together agricultural and nonagricultural sources of income and employ a range of financial tools to meet their families' needs. A nuanced picture of smallholder families will continue to emerge as more data are collected, with increasing focus on how they anticipate and manage risk, make household financial decisions, and leverage a range of financial tools.

1 Estimates of the number of smallholder farms range from 400 million to 500 million, and most recently at 475 million (Lowder 2014); estimates of the number of people living in smallholder households lie between 1.5 billion and 2.5 billion. See Christen and Anderson (2013); Conway (2012); Hazell (2011); Hazell, Poulton, Wiggins, and Dorward (2007); IFAD (2011b); World Bank (2007); and Nagayets (2005).

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

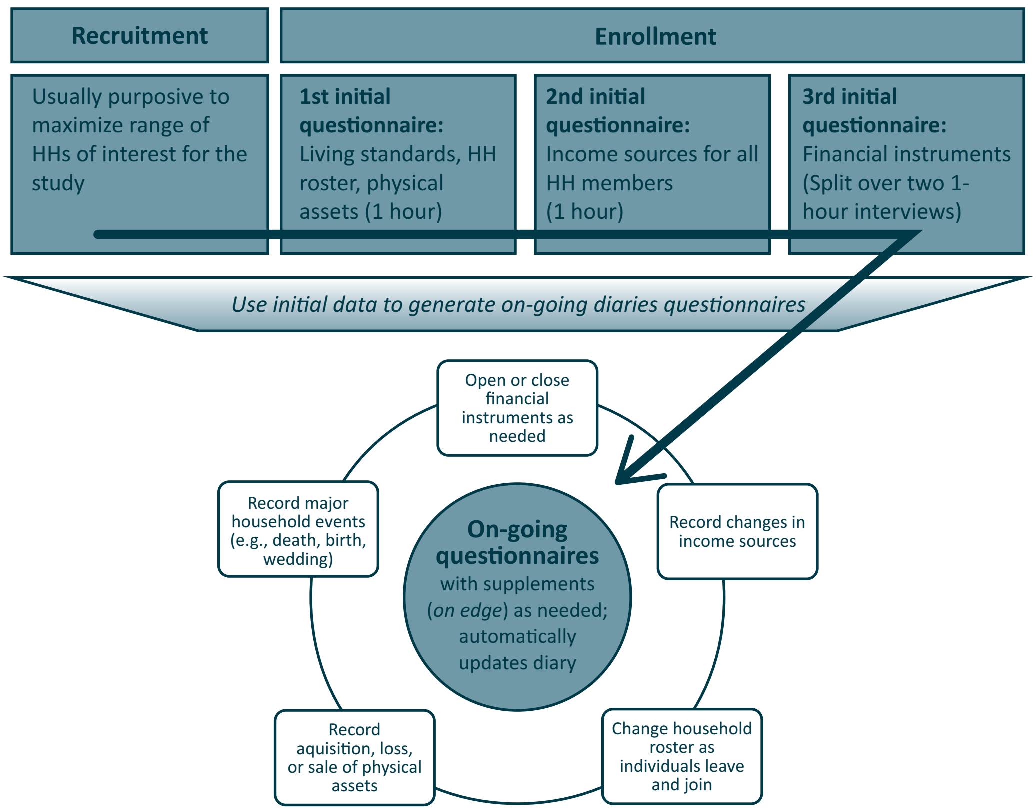
I. Overview of the Smallholder Diaries

Methodology

The financial diaries methodology examines in granular detail how low-income households manage their cash flows.[3] Since many of these cash flows are small, they are captured through a tailored survey instrument. At the start, interviewers guide households through three initial questionnaires that register their demographics and known income sources, assets, and financial tools. This baseline information generates a tailored Smallholder Diaries questionnaire for each family (see Figure 1).

During regular financial diaries visits, interviewers capture a complete set of individual cash flows from the preceding two-week period.[4] Over the course of the discussion, interviewers ask household members about their various income sources, expense categories, financial tools, and transactions; one of the goals is to arrive at a balance between the sources and uses of money in this period. After the interviewer has asked about the sources and uses of money, if the respondent then mentions that he or she purchased some fertilizer, for example, then the interviewer would probe to understand where the money came from to make that purchase, working to reduce the gap between sources and uses of money. Since in-kind transactions can make meaningful contributions to household well-being, interviewers

Figure 1. The Financial Diaries Process



3 For background on financial diaries research, see Collins, Morduch, Rutherford, and Ruthven (2009), Rutherford (2001), the FinMark Financial Diaries, and the results from financial diaries exercises in India, Kenya, Mexico, Rwanda, South Africa, and Uganda (Financial Sector Deepening Kenya 2014, Bankable Frontier Associates 2013).

4 To give a sense of how much data financial diaries generate, a household with two adults and two children and an average number of financial tools would have about 200 data point observations of cash flow over about one month, or 2,400 data points over one year.

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." For example, if a particular income source temporarily stops for a family, but then restarts later in the year, it continues to be tracked but is not double-counted as a new income source. 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. Making these distinctions is important as each crop and livestock activity may have distinct production costs, timing considerations (e.g., preparation, planting, harvest), markets, payment modalities, and risks. Elucidating these differences is an important step in better understanding the financial management challenges facing smallholder households.

Financial diaries also collect information on major income, health, and other shocks that households face, and the related strategies they use to cope with them. Over time, when households experience change—in their employment, as they start using new financial tools, and births, adoptions, and other important life events—interviewers record "change questionnaires"; this information is then used to update the regular financial diaries questionnaires used for that household going forward.

Building on the standard biweekly data collection, the Smallholder Diaries also include deeper exploration of key topics to provide further information and important context. One module explores the aspirations of smallholder households, including both farmers' aspirations and their hopes for their children. Another module builds on the knowledge of each household's financial portfolio and asks about its use of and preference for various financial tools. There will also be a range of targeted questions examining how households make agricultural production decisions and another detailed inquiry on the various risks facing Smallholder Diaries households, including how they are perceived and prioritized and how families cope with them.

The Smallholder Diaries data application tool also includes a crop tracker that allows the research team to capture household consumption of agricultural products, such as eggs and milk, in addition to any other changes in stock (e.g., sales, loss due to pests). This information will paint a picture of crop fluctuations in households over the course of a year and illuminate household dependence on the in-kind consumption of their production and the magnitude and implications of crop loss they experience.

The initial findings presented in this Focus Note are based on a preliminary phase of the Smallholder Diaries and focus on household characteristics that are unlikely to dramatically change over the course of the research, such as their surrounding landscape, household composition, and major crops and livestock (see Table 1). That said, the reported data are subject to modification as the research continues and households experience changes in their income sources, use different financial tools, have children, cope with unforeseen emergencies, and so on. It is also important to bear in mind that the methodology and sample size of a financial diaries exercise are designed to generate a rich pool of detailed information and insights on a targeted population, but they are not intended to be statistically representative of smallholder families in participating countries. The Smallholder Diaries will instead, through intensive, biweekly interviews about the sources and uses of household income over the course of a year, paint a rich picture of the financial lives of relatively prevalent profiles of smallholder households in Mozambique, Tanzania, and Pakistan.

Smallholder Diaries Site Selection. CGAP chose to implement the Smallholder Diaries in Mozambique, Tanzania, and Pakistan because of the variations in their agricultural sectors and the potential for a wide range of smallholder households to participate, with various degrees of engagement in agriculture, a wide range of crops and livestock, distinctions in market relationships, and different levels of digital finance development.

Table 1: Household and Agricultural Profile of Smallholder Financial Diaries Families

	Mozambique Nampula Province (North)	Tanzania Mbeya Region (West)	Pakistan Bahawalpur District (Central)
National GDP per capita (USD) 2014[a]	605	695	1,275
Household characteristics			
Number of villages	3	2	2
Total number of households	95	91	95
Average family size	5	4	6
Average landholding size (hectares)	1.5	0.8	1.2
Percentage of female-headed households	20	31	0
Percentage of households with electricity	10	3	93
Percentage of households with at least one mobile phone	76	66	90
Percentage of households with roof type			
Grass or thatch	78	31	20
Iron or sheet metal	21	69	1
Tiles/other	0	0	79
Percentage of households experiencing major events in previous year			
Livestock death	51	28	21
At least 1 member was hungry or went without food	65	16	0
Lost home or land, or were evicted	2	7	0.01
Percentage of households growing various crops			
Cotton	0	0	34
Wheat	0	7	100
Rice	38	33	96
Peanuts	92	0	0
Potatoes	0	50	0
Maize	50	98	0
Cassava	96	7	0
Beans	93	37	0
Other vegetables	35	6	18
Percentage of households with at least one of various livestock			
Poultry	54	59	26
Goats	10	21	48
Pigs	3	12	0
Buffalo	0	0	87
Cattle	0	21	36
Donkeys	0	5	25
Percentage of households reporting usage of inputs and rain-fed agriculture			
Use pesticides	11	62	100
Use fertilizer	5	60	100
Rain-fed irrigation only (no irrigation access)	98	43	0
Average monthly expenses per capita (USD)	21	38	132

a. See the World Development Indicators (2014).

Within each country, the specific sites selected for the Smallholder Diaries reflect CGAP's focus on the relatively lower-income segments of smallholder households: Noncommercial smallholders and commercial smallholders in loose value chains, as opposed to the small percentage of smallholders in tight value chains.[5] Reflecting the difference in the national context, the three Smallholder Diaries sites vary in terms of the vigor of their agricultural economy. The Nampula Province in Mozambique is characterized by subsistence farming, while agriculture in Mbeya, Tanzania, demonstrates greater diversity and stronger economic activity. Punjab, Pakistan, has the most robust agricultural sector of the three, even in the relatively remote district where the research takes place.

When selecting the research sites in each of the three Smallholder Diaries countries, the goal was to locate at least two villages no more than 40 kilometers apart. The villages needed to be accessible by a paved road so researchers could reach them throughout the year, and they also needed to present distinctions in at least a few important aspects, such as prevalent varieties of crops and livestock, access to irrigation, and average household income levels.

In Mozambique, based on strong recommendations from local stakeholders, the Rapale district, located 20 kilometers outside Nampula town in northern Nampula Province, was chosen. Some large companies do buy cash crops in the province, but this is rare in Rapale, where smallholders tend to practice the subsistence, rain-fed agriculture more commonly found throughout Mozambique. Crop production is notably diverse in this area, even on small landholdings, with an average of five different crops per household, including maize, cassava, beans, and a range of vegetables. The use of agricultural inputs is rare among Smallholder Diaries households in Rapale, and families consume a significant amount of their production at home; many consume whatever they produce, generating little if any surplus to sell. Hunger is prevalent, with two-thirds of families reporting that they had experienced major periods of food insecurity in the past year. In the three villages where the Smallholder Diaries are taking place, only the poorest village has a river nearby, which families can channel to their plots in informal irrigation schemes; in the other two villages, farmers have no access to irrigation and are entirely dependent on highly variable rains.

In Tanzania, the Smallholder Diaries sites are located in the region of Mbeya, home to one of the largest farming populations in Tanzania. Mbeya sits within the Southern Agricultural Growth Corridor of Tanzania (SAGCOT), a region known for a productive agroecological climate, an array of crops and livestock, and relatively good infrastructure and market connectivity. Maize is the most common crop in the region; coffee, tea, rice, potatoes, pyrethrum, and cassava are also widely produced. To explore the diversity within this region, Smallholder Diaries sites were selected in Mbeya in two different districts that show important differences in their economic activity, climate, harvest seasons, crops, and usage of agricultural inputs. In both sites, approximately two-thirds of the Smallholder Diaries households has access to irrigation and has used pesticides and fertilizer, though none of the households is connected to the power grid.

In Pakistan, the Smallholder Diaries are working with households in southern Punjab, within the country's breadbasket. Rice, wheat, and cotton are commonly grown and typically sold through a network of local commission agents (known as *arthis*) and village traders. Given the dominance of agricultural middlemen in Pakistan, the goal was to identify a district with looser connections to the value chain. Visits to a number of districts in Punjab and key informant interviews indicated that smallholder households in Bahawalnagar, a relatively poorer district, had looser connections to agricultural middlemen, thus leading to its selection. Since a vast, sophisticated system of canals in Pakistan irrigates more than 70 percent of the country's farmland, it is not surprising that all households in the Bahawalnagar sample have access to some form of irrigation. Almost all

5 For background on the global segmentation of smallholder households, see Christen and Anderson (2013).

households in the sample are also connected to the national power grid, though electricity may be available for only a few hours each day. The research team selected two villages about 25 kilometers apart: the first primarily grows rice and wheat and accesses the canal year-round, while in the second cotton and wheat are prevalent and the only irrigation comes from semi-perennial canals that have water about six months out of the year. All of the Pakistani households use chemical pesticides and fertilizers.

Smallholder Diaries Household Selection. Once villages for the Smallholder Diaries were selected, the research teams used a screening process to help identify a range of families with varying income sources, access to agricultural inputs, wealth levels, and crops and livestock to participate in the research. In Tanzania and Mozambique, for example, households were selected using a participatory rural appraisal wealth-ranking technique. Working with committees of village representatives, a wealth-ranking exercise with community representatives was conducted to assess the relative wealth of households in village hamlets or subareas. Using wealth ranking, eligible households were selected based on landholdings, number of crops and harvests per year, use of inputs, and integration with local markets to select a variety of families that were generally representative of prevalent profiles of smallholder households.

In Pakistan, the sample was selected using a traditional screener survey with questions related to household demographics, crops and livestock, main income sources, and wealth indicators. As a supplement to this process, village leaders and community representatives were consulted to help ensure local ownership and eliminate households with large landholdings.

In all three countries, the research teams began visiting the Smallholder Diaries households in June 2014, using tablet computers to record their financial information. This Focus Note includes the information collected between these first interviews in June 2014 and December 2014.

II. Initial Insights

1. Agriculture Is Just One of Many Income Sources

Smallholder households generally earn income from a range of sources, including agricultural production, odd jobs from both agricultural and nonagricultural activities, self-employment, and transfer payments such as private remittances and public income-support transfers. The composition of this portfolio of income sources and the relative importance of agricultural production within it can vary widely among smallholder households and change over time, influenced by income-generating alternatives outside of agriculture, the quality of the resource base, and access to markets, among other factors (Christen and Anderson 2013, Jayne 2012, IFAD 2011a, Davis et al. 2010, Valdés et al. 2009, Winters et al. 2009, World Bank 2007, Ellis 1999). Agricultural income is also seasonal and weather-dependent and even in the best of circumstances it alone may not generate enough income to meet household needs. In response, smallholder households tend to maintain various sources of income, from both agricultural and nonagricultural activities, to help mitigate the risk of a shock to any one source (Davis et al. 2010, Morduch 1995).

Agricultural production can also offer families an important source of in-kind income, alleviating at least some of their need for cash income to meet consumption needs and to fulfill social obligations to family and friends. For many smallholder families, their own production represents a significant proportion of their consumption. Working with household income data from 15 low-income countries, Aksoy et al. (2010) found that the share of household income originating directly from agriculture (i.e., crop and livestock production but not wage income) is generally high, approximately 37 percent on average, and that it makes a significant contribution to household consumption. On average, almost half the value of household agricultural income came from subsistence production. A range of literature also suggests that most smallholder households are engaged in agriculture at the subsistence level, generating neither the volume nor the quality to regularly engage with markets (IFAD 2011a, Davis et al. 2010, Jayne 2010, Valdés et al. 2009, Winters et al. 2009).

The relative importance of agricultural production as a household's source of in-kind income may also reflect a household's choice of crops and varieties, tolerance of risk, if and when they purchase inputs, and if and how they store their harvest and prevent post-harvest loss, maintaining quality and timing sales to when markets are most favorable (see Box 1). Understanding this varied landscape of smallholder households is an important step in improving their financial inclusion, as different livelihood strategies may call for different portfolios of financial tools.

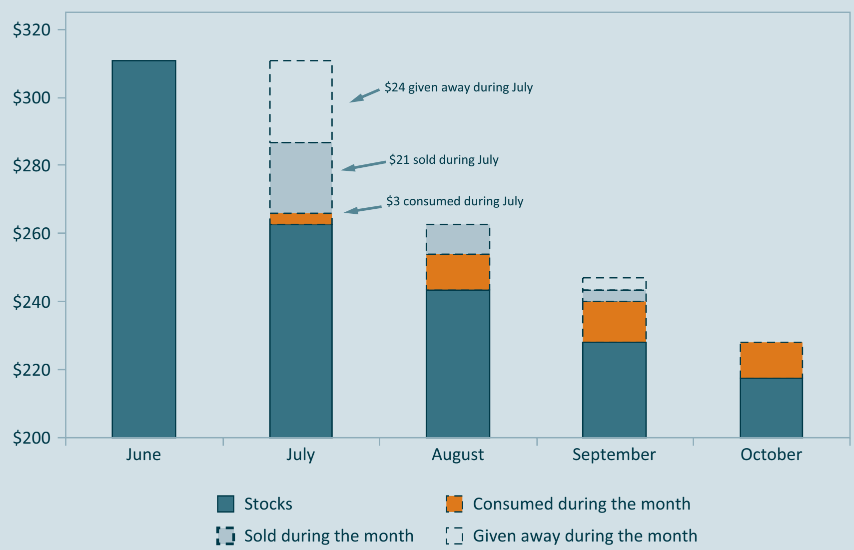
Sources of Income in the Smallholder Diaries. The sample in the Smallholder Diaries includes only households that self-reported agriculture as their most significant source of income, cash or in-kind. Yet even at this preliminary stage of data collection, it is clear that Smallholder Diaries households are balancing a range of income sources, in and out of the agricultural sector, that vary in importance over the year.

Box 1. Smallholder household consumption of agricultural production

Adam and his wife Mary grow rice, maize, beans, and eggplants on nearly a hectare of land in Tanzania, and Mary has a side business ploughing land for others. The couple relies heavily on their own crops and livestock to feed their family, including three school-aged children. To date the Smallholder Diaries show the value of the crops that they have consumed exceeds the value of the food they have purchased. But crop and livestock production remains uncertain: Last year, strong winds killed three of the goats and destroyed their maize, as well as the roof of their house.

Figures B1-1 and B1-2 provide an overview of the various ways in which Adam and Mary's family has harvested, consumed, sold, or given away the crops it has grown. Figure B1-1 depicts how rice stocks declined each month and for what purpose. In July, for example, the family gave away approximately US$24 of rice as a contribution to the funeral for Mary's aunt.

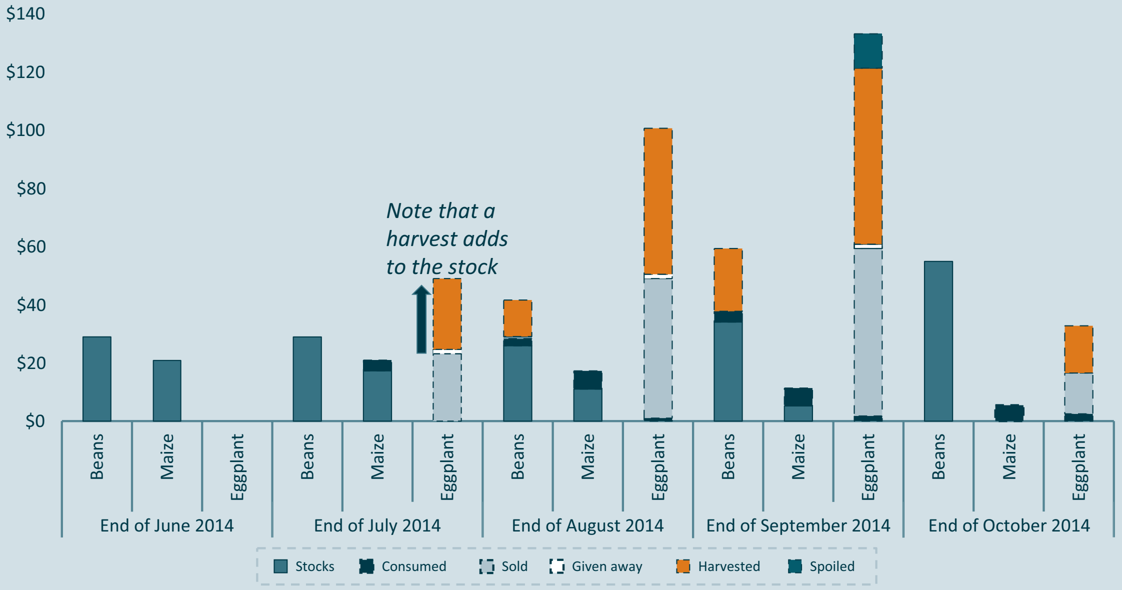
Figure B1-1. Fluctuation of rice stores for Adam and Mary, Tanzania June to October 2014 (USD)



Box 1, continued

Smallholder families rely more on certain crops for consumption, while reserving others to sell for income. As indicated in Figure B1-2, Adam and Mary sold most of their eggplant and consumed some of their maize and beans. Eggplant is a higher-value, highly perishable crop, and the family consumed very little of what they grew to earn more from its sale. Growing multiple crops, Adam and Mary, like many smallholder households, make portfolio judgments about a diverse set of crops, avoiding the risk of one single agricultural income source and attempting to maximize their income.

Figure B1-2. Fluctuation of bean, maize, and eggplant stores for Adam and Mary, Tanzania June to October 2014 (USD)



The experience and results of financial diaries exercises in India, Kenya, Mexico, Rwanda, South Africa, and Uganda indicate that the following categories for sources of income are easily understood by households and also demonstrate important differences in their cash flows (see Figure 2) (Financial Sector Deepening Kenya 2014, Bankable Frontier Associates 2013).

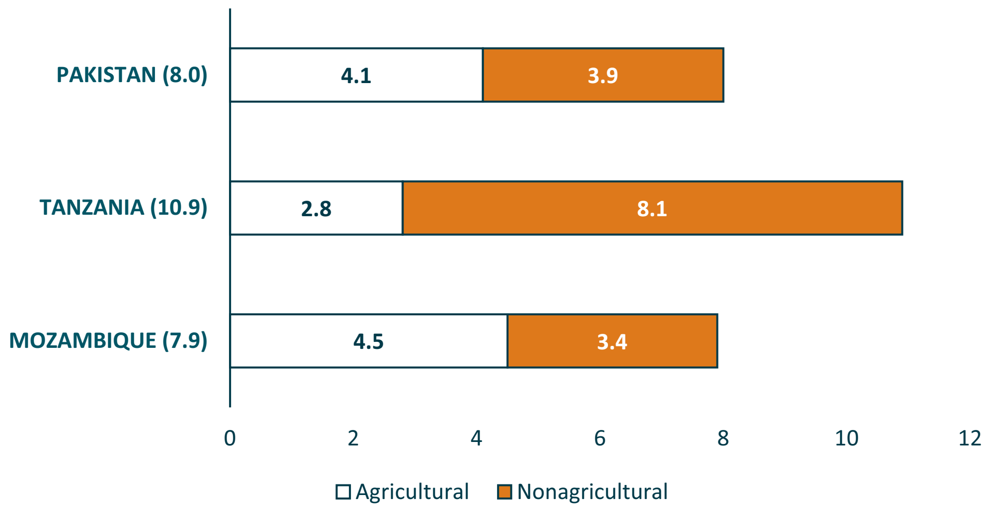
- **Agricultural production income** is money earned from the production and sale of agricultural goods, such as crops and livestock.
- **Self-employment income** refers to sole-proprietor microbusinesses in which someone is managing an enterprise and investing money in inputs, stock, and tools; the activity may be formal or informal, and the work may be full-time, part-time, or occasional. Self-employment income does not come from agricultural production, as this would of course be considered agricultural production income.
- **Regular employment** refers to salaried income received on a regular basis.
- **Odd job income** includes irregular income from short-term employment, such as work on construction sites or helping with the harvest on other people's farms. People employed in odd jobs use only their labor and are not making management decisions or investments, distinguishing it from self-employment income.
- **Nonemployment income** includes grants and other institutionally provided support from charities, hospitals, and government.
- **Resources received** are monetary or in-kind contributions or remittances provided to respondents through their social networks.
- **Rental income** is usually linked to the lease of land or property.

Figure 2. Percentage of households reporting each income source, by country June to December 2014

Initial Indications from the Smallholder Diaries. Initial analysis of the income sources among households in the Smallholder Diaries indicates that, as expected, almost all families in the sample generated income from agricultural production. Many families also earned self-employment income, mostly through selling food or woven mats and baskets out of the home. Approximately 60 percent of Smallholder Diaries households in Mozambique, 80 percent in Tanzania, and 40 percent in Pakistan are earning self-employment income. On average, Smallholder Diaries families have about two businesses per family in Mozambique and Tanzania, and one in Pakistan. In each country more than two-thirds of sample families also depend on odd jobs for their livelihoods, and regular employment is rare in all three countries.

The total number of income sources and the blend of agricultural and nonagricultural income sources vary across the sample as well (see Box 2). In Mozambique and Pakistan, the mean number of total income sources is eight, while in Tanzania sample households reported an average of nearly 11 different sources (see Figure 3). Disaggregating between income earned from agricultural production and income earned from nonagricultural production, households in Tanzania reported on average the most nonagricultural production sources of income (8.1) as well as the fewest agricultural ones (2.8). Many of these nonagricultural production activities include odd jobs related to farming, such as being paid to harvest crops on another's land; other households buy crops from producers and then re-sell them.

Figure 3. Average number of agricultural production and nonagricultural production income sources, by country June to December 2014



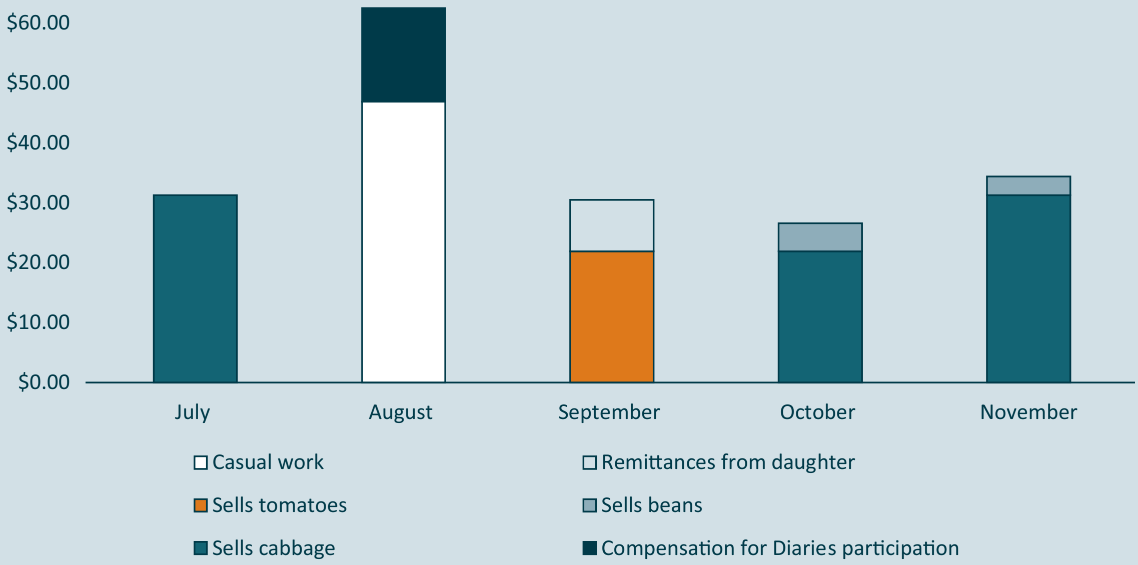
Box 2. Smallholder households juggle agricultural and nonagricultural sources of income

Revenues from agricultural and nonagricultural sources overlap and complement each other regularly in smallholder households. Consider the income flows for Renato and Hecinta in Mozambique: September was a relatively good agricultural month for the couple, with the household having sold tomatoes and cabbage for just over US$30 (see Figure B2-1). But in all other months in this time period, income came from nonagricultural sources of funds. Remittances from their daughter have been helpful in times of scarce income from agriculture, and in August, Renato brought in some income by helping to care for cattle in a nearby village. In addition, the household also received a gift of thanks for participating in the Smallholder Diaries research.[a]

Similarly, Daniel and Mariam in Tanzania rely on earnings from both agricultural and nonagricultural sources (see Figure B2-2). They live in a village with rich soil and no irrigation, where households harvest potatoes (the primary cash crop) once or twice a year and harvest maize (the main consumption crop) once a year. Household members also engage in odd jobs on surrounding farms, brick making, and the sale of local beer. From time to time, they supplement these revenues with remittances received from family and friends. To date, the relative importance of these income sources have varied from week to week. In July, Daniel and Mariam relied on odd jobs, remittances, selling local beer, and selling potatoes, but in August they generated their income through a mixture of odd jobs and remittances.

The motivation behind diversifying income sources between harvests is clear. For Daniel, Mariam, and many other smallholder households, expenses cannot wait for income from the next harvest. Daniel was recently fined US$175 for allegedly renting out family land that he did not own and moreover Mariam is pregnant. Daniel knows how much he needs to pay for the fine, and to pay it he has relied on remittances from family, income from odd jobs and selling local beer, and savings. . . . But the amount they will need to support the baby is unclear, and Daniel has been taking on as many odd jobs as a casual laborer as he can to generate extra income.

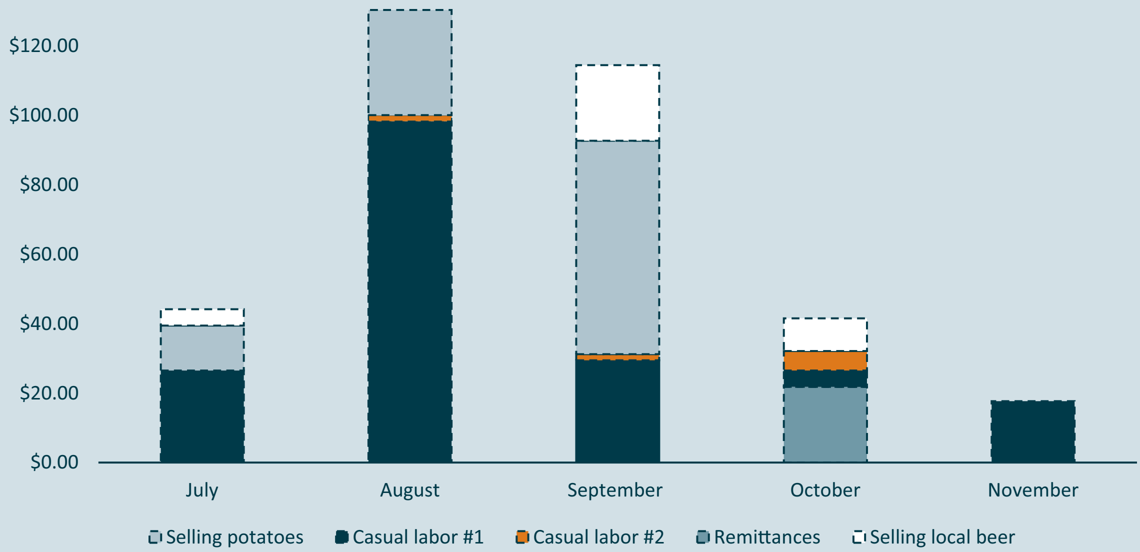
Figure B2-1. Income sources and values for Renato and Hecinto's household, Mozambique July to November 2014



a. The research firms provide small gifts, representing a very small share of income for most, throughout the study to thank respondents for their participation. These are also tracked as income as are the expenditures that were enabled by these extra inflows.

Box 2 continued

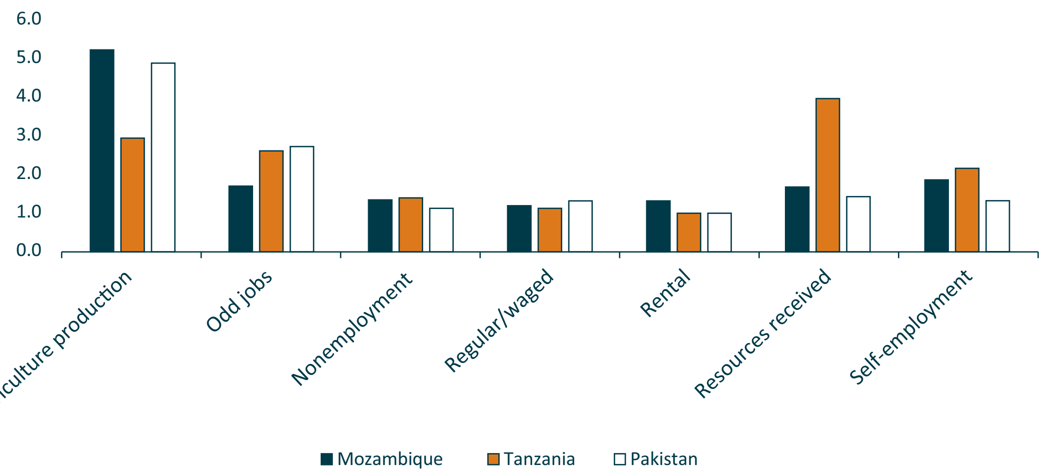
Figure B2-2. Income sources and values for Daniel and Mariam's household, Tanzania July to November 2014



Examining the average number of nonagricultural production income sources per household (among households reporting that source of income), the significance of resources received is notable (see Figure 4). This category of income, which includes money transfers received from family members working at a distance, gifts of money from friends and relatives, and child care services provided for free, seems particularly important in Tanzania. Smallholder Diaries families in Tanzania obtain resources received from an average of four separate individuals, and together these income streams contribute, in cash and in-kind, almost 19 percent of their total household income.

Income from odd jobs also plays a meaningful role in household income sources. Smallholder Diaries families in Mozambique, Tanzania, and Pakistan

Figure 4. Average number of income sources per household, for those households reporting that source of income June to December 2014



have reported to date an average of 1.7, 2.6, and 2.7 different odd jobs, respectively, in their households, and these numbers are expected to increase as data collection continues.

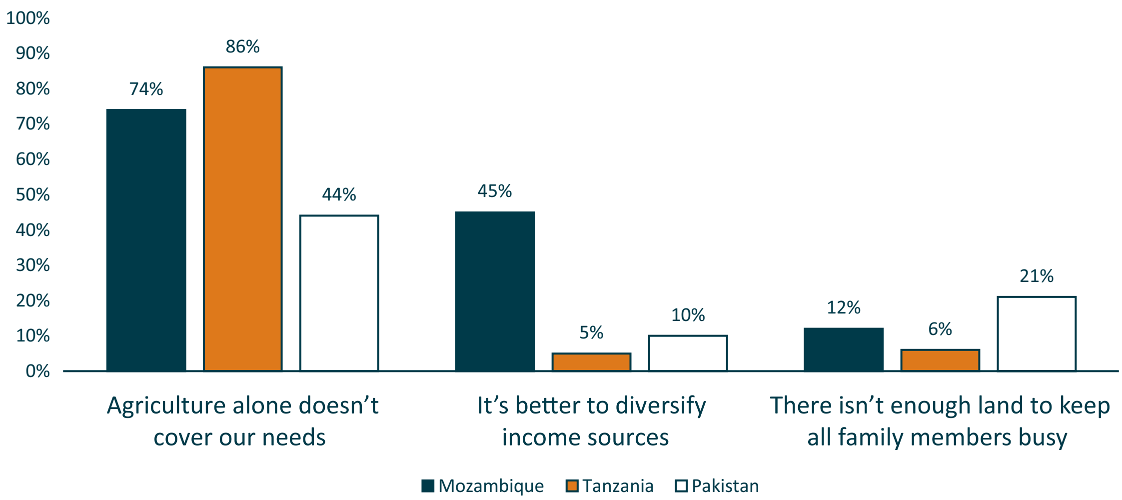
In this initial phase of the research, the Smallholder Diaries included a specific set of questions exploring how and why households choose to engage in agricultural and nonagricultural income-generating activities. When asked why they engage in nonagricultural activities, for example, a top answer was that the income from agriculture alone does not cover their household expenses (see Figure 5). As would be expected, there is also an important dimension of seasonality; in all three countries, early Smallholder Diaries data indicate that families struggle the most, both financially and in terms of food consumption, in the months before harvest. Nonagricultural income-generating activities offer smallholder families an income stream that may be less sensitive to seasonal fluctuations, weather shocks, and periods of uncertainty and can be maintained throughout the year, to varying degrees of intensity. This reflects the income-smoothing behavior described by Morduch (1995), where families mitigate some of their risk by "making conservative production or employment choices and diversifying economic activities," and was also evidenced by the financial diaries exercise in Kenya (Financial Sector Deepening Kenya 2014).

Looking ahead, further data collection will allow analysis of the relative value of this range of income sources and their fluctuations over the year, adding deeper insights to our understanding of how and why smallholder households diversify across a variety of income sources and balance agricultural and nonagricultural income sources. The results from a forthcoming series of questions on the array of risks facing Smallholder Diaries households will also shed light on their priority concerns and their strategies to mitigate and manage them. Ongoing data collection will complement this deeper inquiry, capturing any production and income shocks in the months to come.

2. Smallholder Families Use a Range of Financial Tools

A rich literature has uncovered important information about how poor households use

Figure 5. "Why does your family do nonagricultural work?" Percentage of households that selected the top three answers, by country



Note: The full question asked: "If family members are engaged in work not related the household's own agricultural production, why do they do these jobs?" The verbatim top three answer options were (1) They do this work when they need extra money since agriculture alone does not cover household needs; (2) It is better for the household if some members do nonagricultural work and others do agricultural work; (3) There is not enough land for all members to do agricultural work. Respondents could select multiple answers.

financial tools to work toward multiple objectives.[6] Based on this research, it is expected that smallholder households also work toward several different objectives, including but not limited to their crop and livestock production. And just as they juggle a range of income sources, smallholder families also employ an array of financial tools. Using several avenues, through both formal and informal providers, they pay, store, transfer, and invest.

The Smallholder Diaries trace the use of both informal and formal financial tools among participating families. Informal financial tools—including informal savings groups and borrowing from personal contacts—operate within social circles of families, friends, and neighborhoods; they are flexible and reciprocal, though also unpredictable and limited. Formal financial tools are provided by institutions and groups, such as banks and microfinance institutions that are subject to government regulation and supervision. Though these institutions can handle more complex transactions and more substantial amounts than informal financial tools, they also present higher barriers to entry and a different level of risk (Ledgerwood 2013, Conning and Udry 2005, Nagaranjan and Meyer 2005, Adams and Fitchett 1992).

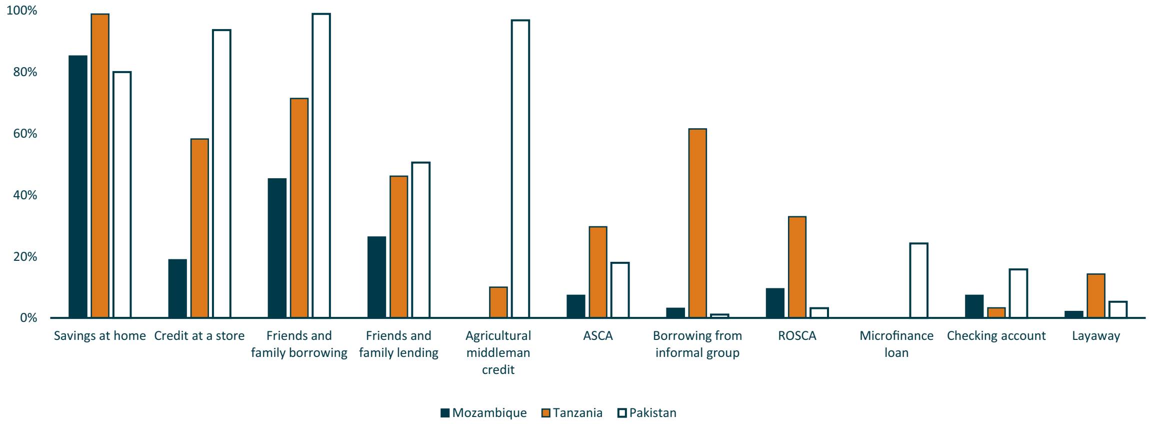
Financial Tools in the Smallholder Diaries. To date, the Smallholder Diaries households have reported using several financial tools:

- **Checking accounts** are current accounts with a formal commercial bank.
- **Rotating Savings and Credit Associations (ROSCAs)** are informal savings groups in which members generally combine their savings together at regular, recurring meetings and take turns giving the entire pot to one member.
- **Accumulating Savings and Credit Associations (ASCAs)**, somewhat more complex informal savings groups, allow members to build up savings over time, lend the group fund to one another, and accumulate interest. A share-out typically occurs once a year when members divide the savings and earned interest among the group.
- **Savings at home** typically includes cash stored in a safe, readily accessible place. Note that strategies such as storing gold and raising livestock are not classified as savings at home, but rather household assets.
- **Borrowing from friends and family** includes informal borrowing from their social network.
- **Lending to friends and family recognizes** that household members can also provide others with financial services, such as lending to friends and family.
- **Borrowing from an informal group** includes borrowing from ASCAs and other community-led savings and credit groups.
- **Informal credit at a store** is an arrangement whereby the shopkeeper lets a household member take goods now and pay later. A household member may buy a sack of flour from a shopkeeper on credit, for example, and promise to pay for it on his or her next visit to the shop.
- **Layaways** are financial tools in which a person pays in installments for a good, and acquires it only once all payments are made.
- **Agricultural middleman credit** is a loan from an input supplier, usually with the understanding that repayment will be in cash or in-kind, after that crop has been harvested. In Pakistan, these middlemen are known as arthis. Farmers sell produce to arthis and obtain fertilizer and pesticides on credit. They can also rely on arthis to finance other major expenditures, such as weddings or emergencies.

Note that each tool is distinguished by both its financial function and its source. For example, each account at a financial institution is a separate device. Each savings group is a different device and if it has separate functions—such as merry-go-round, accumulation, lending, and welfare—then each of those functions would be registered separately. Each source of informal borrowing, including each individual moneylender and each individual lender among friends and family, is also tracked separately.

6 See Collins, Morduch, Rutherford, and Ruthven (2009), Rutherford (2001), the FinMark Financial Diaries, and the results from financial diaries exercises conducted in India, Kenya, Mexico, Rwanda, South Africa, and Uganda (Financial Sector Deepening Kenya 2014, Bankable Frontier Associates 2013).

Figure 6. Most popular financial tools reported by Smallholder Diaries households Percent of households, by financial tool and country June to December 2014



Initial indications from the Smallholder Diaries. Savings at home, including storing money under the proverbial mattress, is clearly the most prevalent savings tool across all three countries (see Figure 6). Lending to family, often used as a savings tool for families, is also relatively common (26 percent, 46 percent, and 51 percent, respectively, in Mozambique, Tanzania, and Pakistan).

Credit from agricultural middlemen is nearly universal in Pakistan, reflecting the country's relatively robust, long-standing relationships in agricultural value chains, but practically nonexistent in Mozambique and rare in Tanzania among Smallholder Diaries households. Informal credit at a store is a more significant financial tool in Mozambique and Tanzania, and equal to the importance of agricultural middlemen in Pakistan among families in the sample. The Kenyan Financial Diaries pointed out that people keep sources of credit "open" by borrowing just a little or even purposely to make sure they have the credit on hand if and when they need it (Financial Sector Deepening Kenya 2014).[7] Tanzanian families using shop credit have so far kept an average of over four lines of credit open with distinct stores. Similarly, from early data, families who borrow from their social network have typically borrowed from six different sources.

Participating in ROSCAs and ASCAs is most common among households in Tanzania. And in all three countries to date, households have typically been active in a ROSCA and an ASCA simultaneously. The use of checking accounts, in contrast, is relatively rare, even in Pakistan, where their use to date was most significant (16 percent versus 7 percent in Mozambique and 3 percent in Tanzania).

Clearly there is no single, perfect financial tool that could meet all the needs of each smallholder household, and many financial tools are also used to accomplish a number of different objectives. Echoing the findings of other diaries research (Collins, Morduch, Rutherford, and Ruthven 2009, Rutherford 2001, the FinMark Financial Diaries), households in the Smallholder Diaries sample are active across a busy universe of financial tools, from the informal to the formal, putting a variety of products and relationships to work in their financial lives. The needs of smallholder families for financial tools are more nuanced and diverse than would be satisfied by a narrow approach to only their agricultural activities, and opportunities for improving their financial inclusion go well beyond formal credit products for agricultural inputs.

A common example is school fees. Paying them is a challenge for many households, and especially for smallholder families who earn a substantial

7 Mas (2014) refers to the practice of nurturing potential sources of future liquidity as liquidity farming.

portion of their income from a harvest that may fall months before or after school fees are due. This presents a significant cash flow challenge, as well as a tension between what may be a significant income stream for the household and its top investment priority. To respond to this need, a relevant financial tool would not need to directly support the household's agricultural activities, but could instead direct agricultural income when and where needed.

In one Smallholder Diaries family in Tanzania, for example, Fatima quickly needed to find US$17 to pay her son's school fees, so she borrowed it from an agricultural agent with the promise to pay him back with five sacks of rice. When she repaid the loan months later, Fatima estimated the value of these five sacks of rice at US$21. Her experience points to the potential value-add of a financial tool that links harvest income to the payment of school fees, or other significant, predictable, and high-priority expenditures.

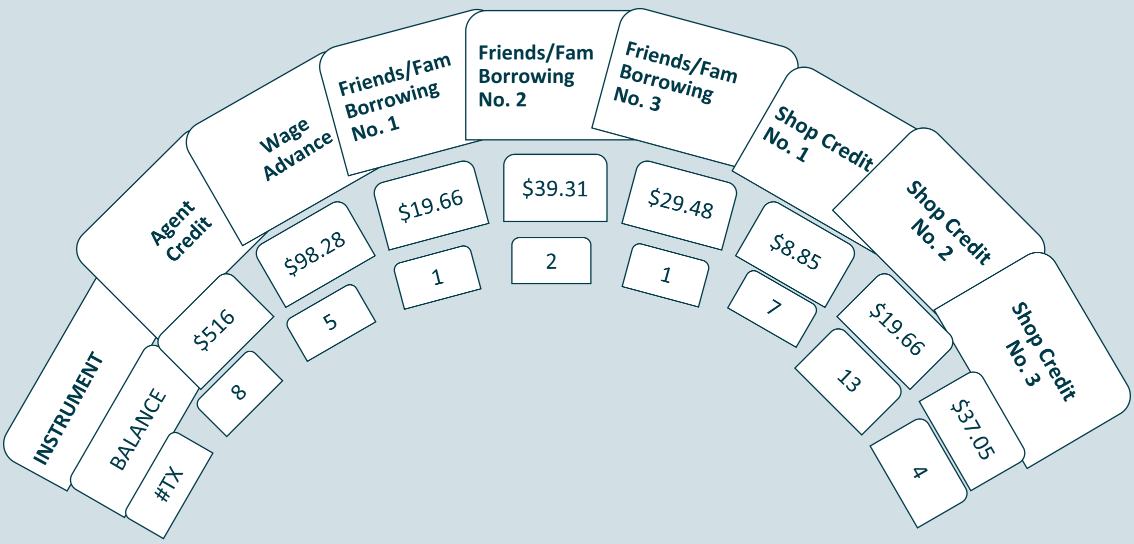
Box 3. Smallholder households use a wide range of financial services

One of the Smallholder Diaries families in Pakistan—Arham, Shamaila, and their three young children—draws on a range of credit tools in a broad portfolio of financial services. Like almost all Pakistani households in the sample, this family relies on informal middlemen, or arthis, who provide agricultural inputs on credit and interact between farmers and buyers. But arthis alone do not meet all of the family's agricultural borrowing needs, nor are these services tailored to the family's circumstances. Even with its relative flexibility, there are clearly limitations to informal trader credit. The family borrows heavily from the local arthi to afford fertilizer and labor expenses, but it also borrows from a number of other sources as well.

Figure B3-1 focuses only on the range of the family's credit portfolio. Between 27 July and 19 December, Arham and Shamaila used shop credit from three different businesses on a total of 24 different occasions. The total current outstanding balance for all three is $66.56. The family also has borrowed from three different friends and family members a total of four times.

When the Smallholder Diaries started in June, they already had US$295 of debt with an arthi for their cotton crop, which had not fared well due to water issues. As of 19 December 2014, Arham and Shamaila had accumulated US$221 more in arthi credit for the new wheat season, putting the total outstanding balance at US$516. But since they were unable to pay back the arthi credit for the previous cotton crop, the arthi did not extend the full amount they needed. They were then forced to also seek about US$30 for seeds from Arham's aunt. Normally, the family would be unable to service this debt using agricultural revenues alone, but Arham has two stable jobs as a milk chiller and as a milk collector, which allow the family to meet most of its financial needs.

Figure B3-1. Credit portfolio with current balances and number of transactions for Arham and Shamaila, Pakistan
27 July to 19 December 2014



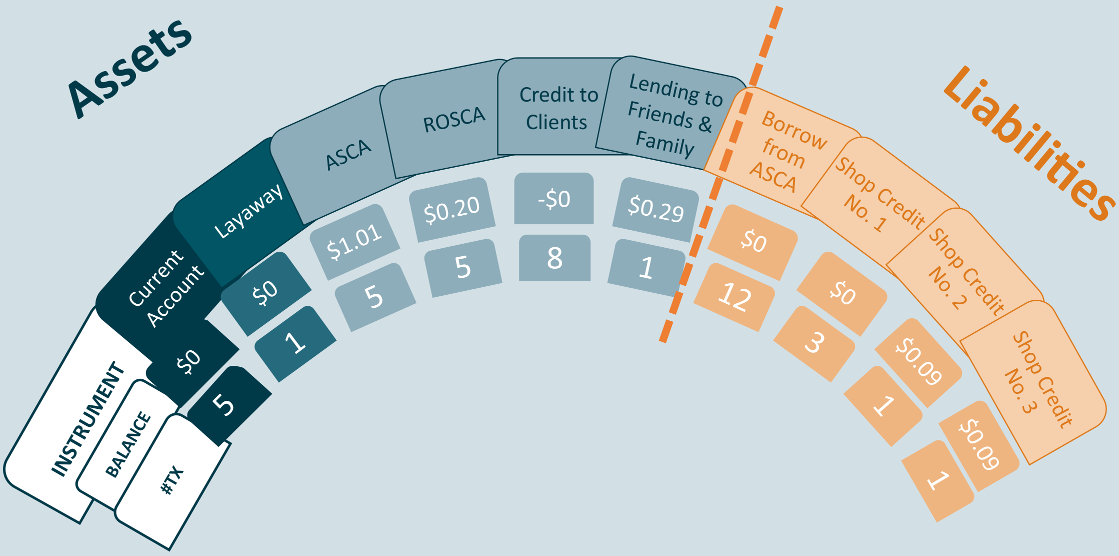
Box 3, continued

Even in the Mozambican sample, in which beyond saving at home, smallholders use other informal financial tools (such as savings groups and borrowing from friends and family) relatively infrequently compared to those in Tanzania and Pakistan, a more robust portfolio has its advantages. Claudia and Ercilio, who live with their two biological children, three adopted children, and two grandchildren, are one of the more financially active families in the Mozambican sample.

As shown in Figure B3-2, the family has used a total of 10 financial tools so far during the course of the study. For each financial tool, the corresponding balance and number of transactions are also given, and the figure is arranged with assets on the left, liabilities on the right, and more formal tools in a darker shade. In addition to this classification of savings and credit, and formal or informal financial tools, the family's portfolio also reflects the various amounts held over different periods of time from a range of sources. Layaway is placed under assets because it has already been paid off (the balance is US$0).

When the family needed to make purchases before the harvest (from late October to early November), it relied on savings and informal credit to cover its expenses (clothes, food, petrol for the son's motorcycle, etc.) because it was unable to earn revenue from selling crops at that time. Interestingly, the current account and layaway are Ercilio's, while the rest of the tools are Claudia's. Claudia has three shopkeeper credits, though she has used them infrequently and the balances are low. In addition, she is keeping about US$640 for other community members in a lock box, while also placing some of her own savings in this ASCA and taking out loans. As the ASCA manager, Claudia has the unique ability to tap into her own savings in the ASCA when she needs money. Answers to the next module on financial tools will help shed important light on why particular tools are more important to the households than others.

Figure B3-2. Financial tools, current balances, and number of transactions for Claudia and Ercilio, Mozambique
15 July to 30 November, 2014



III. Conclusions

Early data from the initial phase of the Smallholder Diaries outline the complexity of the financial lives of smallholder households. They manage a variety of income sources, both connected to and independent of agriculture, and employ an array of informal financial tools—ranging from ROSCAs and ASCAs, to MFIs, agricultural traders, and family and friends—as well as in some cases products from formal financial service providers.

However, gaps remain. Not all of their needs are being met, and no smallholder family needs just one magic-bullet financial tool. More agricultural credit alone is insufficient and, for some smallholder households, this is irrelevant or even unadvisable. Instead, the experience of the Smallholder Diaries to date echoes the diversity of the 475 million smallholder households worldwide, with variations in the resource base, the relative importance of agricultural income, their blend of crops and livestock, how they engage with markets, and how those markets are organized. Recognizing the various profiles of smallholder households, initial data from the Smallholder Diaries signal that different combinations of financial tools will be relevant to different segments of smallholder families.

But what does a *robust* financial portfolio look like, and how specifically do these portfolios and services vary across the segments of smallholder households? As the Smallholder Diaries continue to capture cash flows, the ebbs and flows in income and consumption, household shocks, and important qualitative context, a richer picture of the financial lives of smallholder families will emerge with responses to these key questions.

Smallholder Diaries data will elucidate the diversity of smallholder households, their various livelihood strategies, the range of agricultural and nonagricultural income sources and their relative proportions, and the distinct financial mechanisms in use. These insights will also, most importantly, identify opportunities for financial service providers, policy makers, funders, and other stakeholders to improve and innovate in the financial tools used by smallholder households, responding specifically to their household profile and needs and advancing their financial inclusion.

References

Aksoy, M. Ataman, Javier Beverinotti, Katia Covarrubias, and Alberto Zezza. 2010. "Household Income Structures in Low-income Countries." In M. Ataman Aksoy and Bernard M. Hoekman, eds. *Food Prices and Rural Poverty*. Washington, D.C.: World Bank, pp.: 89–112. http://siteresources.worldbank.org/INTRANETTRADE/Resources/Pubs/Food_Prices_Rural_Poverty.pdf

Bankable Frontier Associates. 2013. "Rwanda Financial Diaries: Understanding the Financial Lives and Product Needs of Rwanda's Underserved Consumers." http://usa.visa.com/download/corporate/_media/rwanda-financial-diaries-bfa.pdf

Christen, Robert Peck, and Jamie Anderson. 2013. "Segmentation of Smallholder Households: Meeting the Range of Financial Needs in Agricultural Families." Focus Note 85. Washington, D.C.: CGAP. http://www.cgap.org/sites/default/files/Focus-Note-Segmentation-of-Smallholder-Households-April-2013_0.pdf

Collins, Daryl, Jonthan Morduch, Stuart Rutherford, and Orlanda Ruthven. 2009. *Portfolios of the Poor*. Princeton, N.J.: Princeton University Press.

Conway, Gordon. 2012. *One Billion Hungry: Can We Feed the World?* Ithaca, N.Y.: Cornell University. http://www.canwefeedtheworld.org/

Davis, Benjamin, Paul Winters, Gero Carletto, Katia Covarrubias, Esteban J. Quinones, Alberto Zezza, Kostas Stamoulis, Carlo Azzarri, and Stefania DiGiuseppe. 2010. "A Cross-Country Comparison of Rural Income Generating Activities." *World Development* 38 (1): 48–63. http://www.fao.org/fileadmin/user_upload/riga/pdf/cross_country_comparison_2010.pdf

Ellis, Frank. 1999. "Rural Livelihood Diversity in Developing Countries: Evidence and Policy Implications." Natural Resource Perspectives, Number 40. London: Overseas Development Institute. http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/2881.pdf

Financial Sector Deepening Kenya. 2014. "Kenya Financial Diaries: Shilingi Kwa Shilingi—The Financial Lives of the Poor." August. http://www.fsdkenya.org/new/our-work/financial-diaries.html

FinMark Financial Diaries. 2015. http://www.financialdiaries.com/index.htm. Accessed 11 February.

Hazell, Peter. 2011. "Five Big Questions about Five Hundred Million Small Farms." Presented at the IFAD Conference on New Directions for Smallholder Agriculture, Rome, 24–25 January. http://www.ifad.org/events/agriculture/doc/papers/hazell.pdf

Hazell, Peter, Colin Poulton, Steve Wiggins, and Andrew Dorward. 2007. "The Future of Small Farms for Poverty Reduction and Growth." Washington, D.C.: International Food Policy Research Institute. http://www.ifpri.org/sites/default/files/publications/vp42.pdf

International Fund for Agricultural Development. 2011a. "Rural Poverty Report 2011." Rome: IFAD. http://www.ifad.org/rpr2011/report/e/print_rpr2011.pdf

———. 2011b. "IFAD Conference on New Directions for Smallholder Agriculture: Introduction and Conference Overview." http://www.ifad.org/events/agriculture/background.htm#1

Jayne, T. S. 2012. Smallholder Farm Differentiation and Inclusive Markets. Presentation at USAID Evidence Summit, The Newseum, Washington, D.C., 12–13 December. http://fsg.afre.msu.edu/gisama/Jayne_USAID_Evidence_Summit_Dec_12_2012_v5.pdf

Jayne, T. S., David Mather, and Elliot Mghenyi. 2010. "Principal Challenges Confronting Smallholder Agriculture in Sub-Saharan Africa." *World Development* 38, no. 10: 1384–98.

Ledgerwood, Joanna, ed. 2013. *The New Microfinance Handbook: A Financial Market Perspective*. Washington, D.C.: World Bank. https://openknowledge.worldbank.org/bitstream/handle/10986/12272/9780821389270.pdf

Lowder, S. K., J. Skoet, and S. Singh. 2014. "What Do We Really Know About the Number and Distribution of Farms and Family Farms Worldwide?" Background paper for The State of Food and Agriculture 2014. ESA Working Paper No. 14-02. Rome: FAO. http://www.fao.org/docrep/019/i3729e/i3729e.pdf

Mas, Ignacio. 2014. "Money Resolutions, a Sketchbook." Working Paper. Washington, D.C.: CGAP.

Murdoch, Jonathan. 1995. "Income Smoothing and Consumption Smoothing." *Journal of Economic Perspectives*. http://www.nyu.edu/projects/morduch/documents/insurance/Income_Smoothing_and_Consumption_Smoothing.pdf

Nagayets, Oksana. 2005. "Small Farms: Current Status and Key Trends." In *The Future of Small Farms: Proceedings of a Research Workshop*, Wye College, 26–29 June. Washington, D.C.: International Food Policy Research Institute, pp. 355–67. http://www.ifpri.org/publication/future-small-farms

Rutherford, Stuart. 2001. *The Poor and Their Money*. Oxford: Oxford University Press.

Valdés, Alberto, William Foster, Gustavo Anriquez, Carlo Azzarri, Katia Covarrubias, Benjamin Davis, Stefania DiGiuseppe, Tim Essam, Tom Hertz, Ana Paula de la O, Esteban Quinones, Kostas Stamoulis, Paul Winters, and Alberto Zezza. 2009. "A Profile of the Rural Poor." Rome: Food and Agriculture Organization of the United Nations. http://www.fao.org/fileadmin/user_upload/riga/pdf/ak423e00.pdf

Winters, Paul, Benjamin Davis, Gero Carletto, Katia Covarrbias, Esteban J. Quinones, Alberto Zezza, Carlo Azzarri, and Kostas Stamoulis. 2009. "Assets, Activities, and Rural Income Generation: Evidence from a Multicountry Analysis." World Development 37 (9): 1435–52. http://www.fao.org/fileadmin/user_upload/riga/pdf/assets_activities_rural.pdf

World Bank. 2007. *World Development Report 2008—Agriculture for Development*. Washington, D.C.: World Bank. http://siteresources.worldbank.org/INTWDR2008/Resources/WDR_00_book.pdf

———. 2014. *World Development Indicators, 2014.* http://data.worldbank.org/indicator/NY.GDP.PCAP.CD

CGAP

No. 102
March 2015

Please share this Focus Note with your colleagues or request extra copies of this paper or others in this series.

CGAP welcomes your comments on this paper.

All CGAP publications are available on the CGAP Web site at www.cgap.org.

CGAP
1818 H Street, NW
MSN P3-300
Washington, DC
20433 USA

Tel: 202-473-9594
Fax: 202-522-3744

Email:
cgap@worldbank.org

This Focus Note was written by Jamie Anderson of CGAP and Wajiha Ahmed of BFA. The authors wish to thank Dana Boggess (Bill & Melinda Gates Foundation), Janine Firpo (Bill & Melinda Gates Foundation), Michael Hamp (IFAD), Ajai Nair (World Bank), Maria Pagura (World Bank), and Lindsay Wallace (The MasterCard Foundation) for their valuable support and insight in reviewing this paper.

The suggested citation for this Focus Note is as follows:
Anderson, Jamie, and Wajiha Ahmed. 2015. "Early Insights from Financial Diaries of Smallholder Households." Focus Note 102. Washington, D.C.: CGAP.

Print: ISBN 978-1-62696-068-8
pdf: ISBN 978-1-62696-069-5
epub: ISBN 978-1-62696-070-1
mobi: ISBN 978-1-62696-071-8