



Getting an education in rural Kenya: Findings based on the Kenya Financial Diaries

A PAPER PUBLISHED IN COLLABORATION WITH FSD KENYA

PUBLISHED BY
Jacobs Foundation
Seefeldquai 17, P.O. Box
CH-8034 Zurich
www.jacobsfoundation.org



IN COLLABORATION WITH
Financial Sector Deeping Trust Kenya



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EXECUTIVE SUMMARY

- 1. Background:** Smallholder farming households, which represent more than 2.5 billion people, make up the majority of people in the world who live on less than US\$2 a day. Many development interventions for smallholder farming households focus on increasing their productivity and consequently their income. When it comes to increases in productivity, are smallholders in particular need of more direct interventions aimed at improving the education of their children? The Jacobs Foundation commissioned this report to better understand the unique challenges that smallholder farming households face with respect to financing their children's education.
- 2. Objectives:** This report seeks to depict the Kenyan education environment from the point of view of the household, with specific emphasis on rural smallholder farming households. It seeks to determine how much Kenyan families actually spend on education, whether in private or public school systems, what percentage of income is spent on education as a proportion of total household income, what value Kenyans in the study place on education, and what financial tools Kenyans deploy in obtaining an education for their children.
- 3. Methodology:** The findings in this paper are based on the Kenyan Financial Diaries. Financial Diaries are a methodological tool that aims to capture fine-grained information on the financial lives of households. All cash flows pertaining to each household are captured over a period of several months. Although the information is self-reported, since it is collected frequently (twice per month) by trained interviewers, it is more accurate than a one-off survey. This quantitative financial information is supplemented by demographic data on the respondents, qualitative responses about well-being, information on major occurrences, and interviewers' observations. For more information, see Kenya Financial Diaries².
- 4. Key findings:** As the Kenyan Financial Diaries included only a small number of low-income households (298) across five specific geographical areas in Kenya, it is impossible to draw conclusions at the national level from these results. This was not the aim of this research. However, given the fine-grained nature of the data, the analysis yielded interesting insights:
 - a. Kenyan Financial Diaries households value education, as evidenced not only by their direct responses, but also by their spending. At the median, education accounts for 11% of their monthly consumption expenditures.
 - b. Agriculture-dominant households have lower per-capita income and the additional burden of larger fluctuations in monthly income compared with other rural households. For agriculture-dominant households, the median standard deviation of per-capita income is 80% of monthly per-capita income compared with 53% and 42% for part-time farmers and other rural households, respectively.
 - c. In addition to having more children (at the median 4 children, compared with 3 in other segments), agriculture-dominant households spend disproportionately more on education. At the median, they spend just under US\$10 per month, per child, compared with US\$6 spent by part-time farmers and US\$9 spent by urban households. For agriculture-dominant households, at the median this represents 5.9% of income and 18% of monthly expenses. Even when schools are free, there are additional expenses for materials, food, extra payments for teachers and exams, and a number of other costs that add up. School fees are seen as the major expense for most households and an important cause of concern and anxiety.
 - d. As a consequence of school fees and expenses that often exceed the households' capacity to pay, children are sometimes intentionally held back in primary school until the substantial expense of secondary school can be met. While we found that this is also true in urban areas, the problem is even more severe in rural areas, and especially for agriculture-dominant households where 93% of secondary school-age children are still at the primary level. Moreover, we observed that when a family is unable to pay for all the children to attend school (especially secondary school, which is more expensive), some may be forced to drop out so that at least one may continue.

- e. Our findings show that school fees are never paid in one large lump sum. The daily cash-flow data captured by the Diaries shows that households pay for education in small amounts, when they have money, throughout the year. It is even more common for them to scramble to pay a small portion of the fees only when they can no longer delay - after children have been sent home because of non-payment.
- f. When fees go unpaid for too long, children are sent home. This usually happens without any warning or ultimatum for the parents. Having a child sent home from school is more common among rural than urban households; this happened to 80% of agriculture-dominant households at least once during the period covered by the diaries. This was true of only 58% of urban households.
- g. A variety of non-financial and financial strategies are employed to finance educational expenses. Just as income is patched together from a variety of sources, households use a complex matrix of income sources, savings and credit to finance education. Commonly, school fees are partially paid using gifts and remittances from relatives (what we call “resources received” in this report). Often, there is a key “sponsor” who covers a substantial share of educational expenses. Agriculture-dominant households pay for school fees by combining income from selling crops and/or smaller but more stable income from milk and dairy products, income from self-employment or casual jobs, payouts from savings clubs and loans.
- h. A striking qualitative finding is that savings are not often the main source of funding for education, and plans for paying for school in the future are not always well formed or realistic. The households (smallholders or not) often find themselves in a last-minute struggle to come up with the money.

5. Conclusions: This report highlights the struggles and sacrifices, as well as the occasional failures, of households as they seek to educate their children. Although agriculture-dominant households are just as motivated as other types of households to ensure that their children are well educated, there is evidence that they are less able to ensure that their children’s education proceeds smoothly. In agriculture-dominant households, children are more often sent home from school for non-payment of fees than children from other kinds of households, and more secondary-aged children are held back in primary school.

The effects of high fees and school expenses are exacerbated by small and variable incomes, as well as by the lack of adequate financial instruments and a cultural belief that money that is not constantly invested is wasted.

ACKNOWLEDGMENTS

Many thanks go to Claudia Huber of the Jacobs Foundation for her invaluable support for this work as well as to Financial Sector Deepening Trust Kenya for allowing us to use the Financial Diaries Kenya data on which this report is based. We would also like to thank the respondents who participated in the Kenya Financial Diaries, as well as the field researchers who worked so hard to collect the data. Any errors that may be found in this document are our own.

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February 2015



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LIST OF ABBREVIATIONS AND ACRONYMS

KCPE	Kenya Certificate of Primary Education
KCSE	Kenya Certificate of Secondary Education
SACCO	Savings and Credit Cooperative
UN	United Nations
UNICEF	United Nations Children's Fund

US\$/KSH EXCHANGE RATE

The local currency in Kenya is the Kenya Shilling (Ksh). The United States Dollar (US\$) equivalent used throughout this document was calculated using a 12-month average between December 2012 and December 2013, the time during which household cash flows were being captured for the Kenya Financial Diaries project. It is Ksh84.73 for every US\$1.

GLOSSARY

The list below contains frequent and vernacular terms used throughout the document.

<i>Agriculture-dominant</i>	Households where agriculture is the main income source
<i>Part-time farmers</i>	Households involved in agriculture but in which agricultural income does not represent the largest share of total income
<i>Rural non-farmers</i>	Households that did not earn or spend anything from or on agriculture-related activities over the duration of the study
<i>Chama</i>	Savings club
<i>Chang'aa</i>	A type of illegally brewed alcoholic beverage
<i>Harambee(s)</i>	Fundraising(s)
<i>Kibarua</i>	Casual labor (plural: Vibarua)
<i>Okoa jahazi</i>	Emergency phone credit
<i>Shamba</i>	Garden

1. BACKGROUND: A KENYAN EDUCATION

Over the past two decades, governments, donors and international organizations have made efforts to design policies and invest more in children's education, which has translated into a significant increase in enrollment, particularly at the primary level. According to the UN (The Millenium Development Goals Report, 2014), the net enrollment rate for primary education in Sub-Saharan Africa increased from 60% to 78% between 2000 and 2012. Although this is promising progress, enrollment is still far from 100%. Moreover, high drop-out rates are a serious impediment to achieving universal primary education.

In 2003, following a period of cost-sharing policies affecting school expenses that led to a decrease in enrollment rates and an increase in the number of dropouts, the Kenyan government instituted free and compulsory primary education.³ The response to this policy was overwhelming, with record numbers of children seeking admission and enrollment. From December 2002 to December 2004, the number of children in public primary schools increased from 5.9 million to 7.1 million. The abolition of school fees also had a positive effect on primary school completion rates and decreased the rate of grade repetition at the primary level.⁴

According to United Nations Children's Fund (UNICEF) statistics,⁵ although 2008–2012 Kenyan primary school enrollment rates are relatively high, secondary school enrollment and attendance rates are dismally low.

TABLE 1: KENYAN PRIMARY SCHOOL ENROLLMENT RATES

2008–2012	MALE	FEMALE
Net ⁶ primary school enrollment rate (%)	84%	85%
Survival rate to last primary grade (%)	96.1%	96.1%
Net secondary school enrollment rate (%)	51.6%	48.4%
Net secondary school attendance rate (%)	39.5%	41.6%

Moreover, improvements in the quality of primary education in Kenya do not match progress in enrollment. The 2012 Uwezo Annual Learning Assessment⁷—the third of its kind carried out in Kenya and the largest such survey in Africa—underscores the poor quality of education: Kenyan children are not acquiring basic literacy and numeracy competency at the appropriate age and grade. Furthermore, absenteeism is high among children, especially those in the lower grades. On a positive note, the report finds that public schools have adequate numbers of trained teachers. The Uwezo report shows that only 30% of children in grade 3 can do grade-2 work, while 11% of children in grade 8 cannot do simple grade-2 math and 7% cannot read a simple story in either English or Swahili.

A World Bank report⁸ draws attention to some of the factors that affect the quality of education in Kenya. The number of books and teachers, while sufficient overall, is not evenly distributed throughout the country; other factors include teacher absenteeism because of illness, pupil absenteeism because of the effects of HIV/AIDS, orphaned pupils, inadequate physical structures, outdated teaching methods, inadequate teaching and learning aids, lack of sanitary pads for girls, long distances to schools, etc. A World Bank report cited by *The Economist*⁹ reveals that in 2013, Kenyan teachers were absent almost half the time, and students in Kenya's public schools received only a little more than two hours of instruction a day, on average. Another study found that only one-third of public school teachers scored at least 80% when tested on the curriculum they are expected to teach.

Moreover, despite the government's introduction of free and compulsory primary education, Kenyan education is in fact not free.¹⁰ Households still face education-related expenses for such items as school uniforms, textbooks, notebooks, lunch, transportation, registration fees for standardized tests, hiring teachers to cope with shortages, etc. These costs are rising every year, with the burden falling particularly on low-income households.

³ In Kenya, children are expected to start their schooling around the age of 3, with 1–2 years of pre-primary education, then enroll in primary school, which lasts 8 years. Depending on their marks on the Kenya Certificate of Primary Education (KCPE), they may qualify to attend secondary school, which entails forms 1–4. Secondary education is completed upon receipt of the Kenya Certificate of Secondary Education (KCSE). College or tertiary education takes 4 years and admission depends on the completion of KCSE.

⁴ <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2009/04/22/000334955-20090422075245/Rendered/PDF/482370PUBoAFR0101OFFICIALoUSEoONLY1.pdf>

⁵ http://www.unicef.org/infobycountry/kenya_statistics.html#117

⁶ Net enrollment rate is defined as: enrolled children in the official school age group/total number of children in the official school age group.

⁷ <http://www.uwezo.net/wp-content/uploads/2014/05/Kenya-Report-2012-WebFinalUpdate.pdf>

⁸ <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2009/04/22/000334955-20090422075245/Rendered/PDF/482370PUBoAFR0101OFFICIALoUSEoONLY1.pdf>

⁹ <http://www.economist.com/news/middle-east-and-africa/21596981-paid-private-schools-are-better-value-money-free-sort-classroom>

¹⁰ <http://www.economist.com/news/middle-east-and-africa/21596981-paid-private-schools-are-better-value-money-free-sort-classroom>



In fact, the well-intended elimination of primary school fees (and it is important to note that this applies only to primary school fees) may have had unintended financial consequences for households. A recent World Bank Paper¹¹ argues that the abolition of such fees has led to a sharp increase in demand for private schools, as public schools have become overcrowded. Private schools, in turn, have more than doubled their fees. The authors also maintain that abolishing fees has contributed to a perceived decline in public school quality. The previously cited Uwezo report confirms that private primary schools do indeed outperform public schools in terms of student skills. This finding also holds true when it comes to national standardized test scores. Given that access to secondary education is dependent on these scores, it is understandable that households are willing to pay the fees charged by private schools to obtain a higher-quality education and improve their children's chances of being admitted to secondary-level schooling.

Evidence seems to suggest that private returns per year are approximately proportional to each additional year of education. However, there are studies¹² that show that returns of higher education (tertiary) in Kenya are disproportionately higher, and this belief is a popular one among Kenyans. In order to be admitted to a university, one needs to succeed in secondary school, and in order to be admitted to a good secondary school, one needs a good primary school education. The efforts made by poor families are often so great that one needs to ask whether the additional value gained from a private school education is really worth it.

This study describes the Kenyan educational environment from the point of view of the household, with specific emphasis on rural smallholder farming households. It explores the following questions: How much do Kenyan families actually spend on education, whether private or public? What percentage of income is spent on education as a proportion of total household income? Do Kenyans believe that education is worth pursuing, given its costs? What financial tools do Kenyans deploy in order to obtain an education for their children?

¹¹ Can Free Provision Reduce Demand for Public Services? Evidence from Kenyan Education, Policy Research Working Paper 668, The World Bank, November 2013.

¹² <http://college.holycross.edu/ej/Volume32/V32N3P493-513.pdf>

2. THE KENYA FINANCIAL DIARIES

The findings in this paper are based on a very rich dataset, the Kenyan Financial Diaries. Financial Diaries are a methodological tool that captures fine-grained information on the financial lives of households. All cash flows pertaining to each household are recorded over a period of several months. While the information is self-reported, it is collected frequently (twice per month) by trained interviewers, making it more accurate than a one-off survey. This quantitative financial information is supplemented by demographic data on the respondents, qualitative responses about well-being, information about major events, and journal-type information concerning the interviewers' observations. Moreover, several short thematic surveys capturing qualitative information on life history, aspirations, etc. are conducted throughout the duration of the study.

The Kenyan Financial Diaries include a relatively small sample of households—only 300—and the sampling method does not allow for inferences about a larger population. All the results presented here should be regarded as indicative and used only to inform possible topics that warrant further exploration. All the same, the richness of the data provides a valuable window into the (financial) lives and attitudes towards education of poor rural households in Kenya. More details on the methodology and sample can be found in Annex A.

Since this paper is concerned primarily with farmers, we focus mainly on rural households (a total of 204), dividing them into three subgroups based on their involvement in agriculture and their dependence on agricultural income. Based on how important agricultural income is as a proportion of total household income, we define three rural household groups, in addition to an urban group, sometimes used for purposes of comparison. The first group is made up of households for which agriculture is the main income source¹³—agriculture-dominant. The second group—and the largest—includes households that are involved in agriculture, but for which agricultural income does not represent the largest share of total income—part-time farmers. The third group consists of households that had no earnings or expenditures related to agricultural activities over the duration of the study—rural non-farmers.

TABLE 2: NUMBER OF HOUSEHOLDS IN EACH SEGMENT

AGRICULTURE-DOMINANT	PART-TIME FARMERS	RURAL NON-FARMERS	URBAN
Rural households	Rural households	Rural households	Urban households
22	128	54	94

Information about the three segments' demographics, income and financial portfolios can be found in the Annexes.

In terms of methodology, note that throughout this report, we often rely on means and proportions as our main statistical tools. Occasionally, however, we report medians as well when this is meaningful. The median represents the middle of the distribution, with half below and half above. In the case of income, for example, the median is the value that separates the half of the population that earns more and the half that earns less. When the sample is small, the mean may be greatly influenced by outliers (unusually high or low values). Including the median as an additional or alternative statistic provides a better understanding of the data and an indication of the range of the underlying observations.

¹³ This does not necessarily mean that agriculture accounts for more than a certain percentage of income, but simply that it is the largest income source.

3. HIGH VALUE OF EDUCATION

Whether children’s education is perceived as valuable and how the benefits of such education compare with the costs are important demand-side considerations, with the potential to influence the outcomes of education policies, as well as a direct influence on household-level financial strategies and prioritization of spending.

In the case of farmers (although not exclusively), the cost of sending children to school is amplified by the additional opportunity cost of the children’s time. Children, after all, can help on the farm. In fact, a World Bank study on the abolition of school fees in several African countries⁴⁴ deems child labor to be a critical factor affecting school attendance in Kenya.

However, the decision to send children to school is not only driven by rational cost-benefit analyses. These decisions are also affected by culture, beliefs and attitudes. Through qualitative data gathered throughout the Diaries, we were able to gain insight into how our respondents perceive the value of education for their children. Indeed, we are left with the strong impression that Kenyans, and especially rural households, value education; they see it as a way of improving their children’s prospects in life and as a source of pride and a measure of accomplishment in life.

For example, in one of the qualitative modules of the Financial Diaries study, we asked one respondent from each household about the life accomplishments that made them most proud. Educating their children or siblings is one of the most common themes among all respondents, urban and rural alike, including farmers. While respondents also said they were proud of having a family and children and taking care of them, or of building a house or buying a piece of land, being able to send their children or siblings to school is mentioned more often than other achievements. In fact, of all respondents, approximately 25% mention education as one of their main sources of pride. Rural people were as likely to be proud of education-related achievements as urban people.

BOX 1: PRIDE IN EDUCATION

“He is proud to have educated his children. He took a loan to pay school fees. His wife does business to supplement family income.”

William, a farmer with two children enrolled in university and one in primary school.

“He is most proud of being able to educate his children. The first-born is in class seven and he intends to educate his children up to university level.”

Abdul, a 45 year old farmer with five young children, three of whom are attending school.

“He is proud of education, of being able to educate all his children. He intends to continue to do so for the remaining children in school until secondary. The ones who will do well will be educated until college level in order to secure good jobs.”

Cornelius, an elderly farmer with five children and grandchildren, two of whom are living with him and are still in school. His daughter Janine is attending college.

“She is proud of seeing her children through school—all have been through form 4. She was able to do this because her husband helped and because she was able to borrow from a women’s group [...] as well as from a shylock. She repaid by growing veggies.”

Violet, a 59 years old widowed farmer, lives with her adult daughter and four grandchildren. Two of the grandchildren are currently in primary school and one is in secondary.

“He is very proud because two of his children who were in university finished. This also makes his life easier because he is no longer strained to pay school fees.”

Benjamin, a 58-year-old farmer.

⁴⁴ Abolishing School Fees in Africa. Lessons from Ethiopia, Ghana, Kenya, Malawi, and Mozambique, The World Bank, 2009.

The answers given by farmers (Box 1) clearly reflect the great importance these respondents attach to education as a measure of success in life, but they also hint at struggles associated with putting children through school. When we asked respondents to tell us how they foresee the success of their children in life, nearly every single respondent indicated that they see a strong link between education and success. Many said they were optimistic about their children's prospects because they think they will be able to go to school.

Going to school and getting an education is clearly seen as a path to success in life, although not everyone is optimistic about the possibility of achieving it for their children (Box 2). Some respondents express apprehension and uncertainty about being able to put their children through school for long enough, or in a good-enough school, so that they will gain enough education to allow them to become successful and eventually help their families.

BOX 2: PERSPECTIVES ON EDUCATION AND WORRIES ABOUT SUCCESS

“He thinks his children will be successful, because he is investing in them in form of education. Education is key to success.”

Luka, a farmer with a son who attends college

“The children will be successful in life, but they have to work hard in school and they have to be supported by paying school fees for them.”

Dominic, a rural father of five. Only two of his children are of school age, the other three are still too young.

“Her children will achieve success, because she wants them to work hard in school and she pays school fees for them.”

Edwin and his wife are farmers. Two of their children are currently enrolled in primary school.

“She doubts her children will succeed, unless she saves money and provides them with a good education.”

Agatha is a 38-year-old single mother from an urban area. Her two daughters are 22 and 16.

“She doesn't know if her children will be successful. The elder son didn't go to school and she is not sure whether the younger children will continue in school or drop out.”

Rose, a rural single mother. Three of her children are enrolled in school, a fourth is still too young.

“He is not sure whether the children will succeed. If they work hard in school and he manages to pay school fees they will get good jobs.”

James, a rural father with five children in primary school.

Two of them (16 and 18) should have been in secondary school.

4. EDUCATION LEVELS IN THE FINANCIAL DIARIES SAMPLE

Recognizing the value Kenyans attach to education, and that they strive and hope to be able to offer it to their children, we next turn our attention to determining to what extent they succeed in doing so. A good way to do this is to compare the level of education of all respondents with the level of education of farmers.

We start by exploring the education level of those respondents not currently enrolled in school. These include adults, for the most part, but also a small proportion of children who were not attending school. While these children may later resume their education, in many cases they may have reached the highest level of education they will attain.

Not surprisingly, we find that educational achievement is higher for urban respondents than for rural respondents. Urban respondents have 9.2 years of education, on average, while rural respondents have 7.6 years of education. Approximately 9% of rural respondents have no education at all, compared with 4% of urban respondents. Nonetheless, these results are relatively favorable even for rural respondents and, interestingly, they are quite similar across the various categories of rural respondents.

Looking at school-age children (between 6 and 18 years old), we see high levels of school enrollment. Approximately 96% of school-age children in both rural and urban households are in fact enrolled in school. It should be noted, however, that although primary education is compulsory in Kenya, there is little enforcement of the law.

School enrollment is only one of the first steps towards education. Looking at enrollment rates alone can obscure other issues, such as the length of time it takes a child to actually graduate. For instance, children between 14 and 18 should be attending secondary school. However, in the Kenyan Diaries sample, we see that many of these children are still only in primary school. In urban areas, nearly 40% of children who should be in secondary school are still at the primary level. In rural areas, the problem is even more serious. Among agriculture-dominant households, 93% of secondary school-age children are still in primary school. Among part-time farmers and other rural households, the proportion is somewhat smaller—86% and 83% respectively—but still quite large. Children from rural areas who are between ages 14 and 15 and still enrolled in school have completed, on average, less than 6 years of education. This is 2 to 3 years less than they should have completed by that age.

There may be various reasons why children have not finished as many years of education as they should have. For example, their performance may not have been adequate for promotion to the next grade or to the secondary level, or they may need to work in the fields or in other family businesses, requiring them to drop out. However, field evidence and qualitative data suggest that in fact, in many cases, children are intentionally held back. Their parents may make them repeat primary school grades until they can afford the much larger expense of sending them to secondary school. This highlights how school fees and related expenses can affect levels of educational attainment.

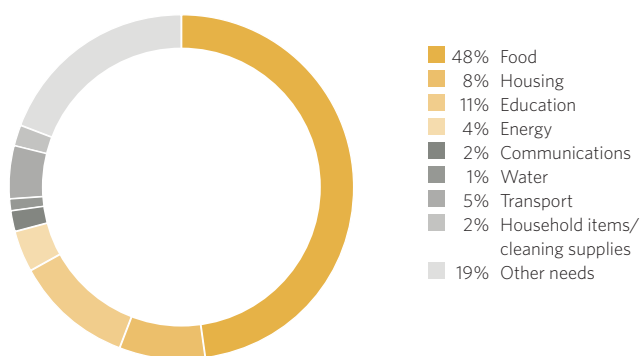
In the following sections we examine school fees and expenses in more detail, compare them with the income levels of various groups and assess their standing in the household portfolio of expenses.

5. HOUSEHOLD SPENDING ON EDUCATION

Although public primary school is supposed to be free, many Kenyans choose to send their children to private schools because they associate them (perhaps accurately) with better-quality education. Even when schools are available within walking distance of home, the preference is to send children to boarding school instead of having them come home at night, in order to keep the children more focused on their studies. Moreover, as previously mentioned, households incur other school-related expenses even if they opt for free public education.

For purposes of data collection, school-related expenses were assigned to three categories: school fees, scholastic materials (textbooks, notebooks, etc.), and other school expenses (pocket money, boarding costs, etc.). Our data have one important shortcoming, since we did not collect information about the individual children for whom fees were paid, nor did we determine whether the fees were paid for primary or secondary school. However, our quantitative and qualitative data show that the school expenses vary from one household to another, based on school level (for example secondary education is, as expected, much more expensive than primary school), the number of children enrolled, the school chosen and other factors.

FIGURE 1: MEDIAN SHARE OF CONSUMPTION ON VARIOUS HOUSEHOLD NEEDS (%)



After food, one of the largest expenses for a household is education. The total monthly expenditure for the median household adds up to KSh660 (US\$8). This is very high, given the relatively low incomes of our respondents. The mean per-capita income for rural respondents was less than US\$2 per day, while that of urban respondents was less than US\$3.50 per day (more about income in the next sections). Surprisingly, rural and urban households have similar expenses, although rural households are poorer than urban households.

When respondents in qualitative interviews were asked to predict their top three expenses in the coming year, a large majority listed school expenses as number one. Of 204 rural respondents, 147 mentioned school fees and related costs as one of their top three expenses. For 97 respondents, school fees were the first expense to come to mind. However, the actual amounts vary quite a lot from one household to another. For example, although some households were expecting to spend around KSh2,000–KSh3,000 (US\$24–US\$35) or less, others said they were expecting to pay much higher amounts on school fees and related expenses—as much as KSh200,000 (US\$2,360).

BOX 3: NEXT YEAR'S TOP EXPENSES FOR RURAL HOUSEHOLDS

Agriculture-dominant household with 2 children in college and one in primary school:

- School fees—KSh120,000 (US\$1,416)
- Paying workers who pick tea—KSh3,000 (US\$35)
- Farm inputs—KSh4,000 (US\$47)

Rural single mother with two children starting secondary school

- School fees—KSh31,000 (US\$366) for two kids in secondary school. One of them is just enrolling, so she will need books, uniform, shoes.
- No other major expenses

Part-time farming household with one child in primary school

- Building a house—KSh30,000 (US\$354)
- School fees—KSh10,000 (US\$118)
- Shamba labor—KSh3,000 (US\$35)

Part-time farmer household with one child in school

- Vocational training fees—KSh20,000 (US\$136)
- Farm inputs—KSh15,000 (US\$177)
- Food—KSh150/day (US\$2)

Large, combined part-time farmer household with six children in school

- Building a house—KSh100,000 (US\$1,180)
- Buying a water tank—KSh50,000 (US\$590)
- Taking the son to boarding school—KSh50,000 (US\$590)

Clearly, despite the free primary school policy, school fees and related expenses represent an important expenditure to Kenyan respondents. For some, it is on par with large asset investments such as building a house. Nonetheless, the respondents feel strongly about offering their children a good education. Given that rural households, and farmers in particular, are likely to be poorer and have incomes that fluctuate to a greater extent, the next section explores how paying for school fees compares with income level and variability, and looks at the proportion of income and expenses allocated by households to education.



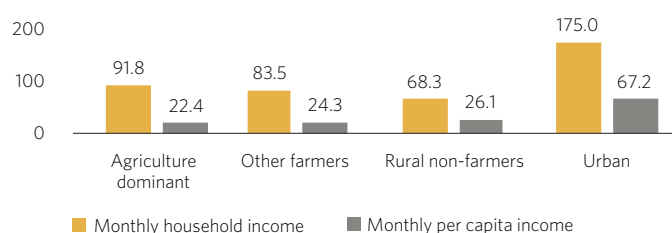
6. EDUCATION SPENDING BY SEGMENT

Being able to afford school fees and having money available when they are due (or rather when payment can no longer be delayed) is critical. To better understand these issues, this section examines not only income levels, but also differences in education expenditures and their share of income and total expenditures across the four household segments.

The Kenyan Diaries reveal that in rural Kenya, gifts and remittances from outside the household are a common and substantial source of income for a large proportion of households. However, agriculture-dominant households receive only a small proportion of their total income from remittances. Additionally, agriculture-dominant households do not typically earn income from regular employment.

When we compare incomes across rural segments, we see that agriculture-dominant households make a little more money at the household level than the other two rural segments. However, on a per-capita basis, agriculture dominance seems to be slightly correlated with a lower income. Still, it should be noted that these differences are not statistically significant, as there are large differences across households within each segment. To put these findings into perspective, the urban respondents (who are quite poor themselves) have a median per-capita monthly income that is about three times that of agriculture-dominant households.

FIGURE 2: TOTAL HOUSEHOLD INCOME, BY SEGMENT (MEDIAN, US\$)



Annex 2 offers more details about income sources, agricultural income and how it compares to income from other sources, how variable and “lumpy” it is, and the strategies farmers employ to patch together a living. One of the most interesting findings is that smallholder households do not typically rely on income from agriculture only. In fact, in our sample, we found that involvement in agriculture is associated with a high number of income sources, including many that are unrelated to agriculture. In addition to diversifying crops, households patch together income from as many other sources as they can as a strategy for smoothing income over time and mitigating risks.

A look at family size and number of children (Table 3) reveals that agriculture-dominant households are, on average, larger than other rural households. They have both more members overall and, also importantly, more children (more details on the socio-demographic composition of households can be found in Annex 2). This is consistent with our expectations. We also find that the percentages of households with children at either the primary or the secondary education level are very similar among all three rural groups, but a slightly larger proportion of urban households have children in secondary school. Agriculture-dominant households have more children in primary school per household than urban or the other rural households.

TABLE 3: HOUSEHOLD COMPOSITION AND SCHOOL ENROLLMENT OF CHILDREN, BY SEGMENT

	AGRICULTURE DOMINANT	PART-TIME FARMERS	RURAL NON-FARMERS	URBAN
Number of members per household (median)	6.5	5	4	4
Number of children per household (median)	4	3	3	2
% households with children in primary school	73%	76%	76%	54%
Number of children in primary school, per household* (median)	3	2	2	2
% households with children in secondary school	14%	19%	19%	26%
Number of children in secondary school, per household* (median)	1	1	1	1

*for households with children enrolled at that level

Against this backdrop, we consider how school fees and related expenses measure up to income, particularly taking into account the fact that approximately 90% of households in each segment have at least one child enrolled in school. The Diaries data reveal that agriculture-dominant households pay more per month on school fees and expenses than households from other segments—in fact, about two times as much. These are very large expenses for households with a median per-capita income of barely US\$30 per month, even after we take into account the consumption of self-produced food (Annex 2).

Table 4 shows just how large school expenses are as a proportion of household income and total expenses. Rural households dedicate a significant portion of their expenditures to paying for education. One household in particular, headed by a part-time farmer, reported spending on average more than 64% of his income to pay for school expenses.

School expenses account for a larger share of income and expenditures for agriculture-dominant households (18%) than for other types of households. In the case of urban households, the median share of expenditures for school fees is 9%. Moreover, although the data do not permit a rigorous analysis of expenses per child or per type of education, nor do they allow us to distinguish between private and public schooling, a rough calculation (Table 4) shows that agriculture-dominant households spend more on a per-child basis than other segments.

TABLE 4: SPENDING ON EDUCATION, BY SEGMENT (US\$)

	Proportion of monthly household income spent on school expenses		Proportion of monthly household expenses spent on school expenses		Monthly school expense per child*	
	Mean	Median	Mean	Median	Mean	Median
Agriculture dominant	8.6%	5.9%	22%	18%	US\$30.50	US\$9.50
Part-time farmers	8.2%	5.3%	17%	14%	US\$16.80	US\$6.10
Rural non-farmers	7.2%	3.7%	16%	11%	US\$12.30	US\$4.20
Urban	5.1%	3.2%	11%	9%	US\$17.10	US\$8.50

* Total number of children per household was calculated as 0.5* children in kindergarten or primary + children in secondary + children in tertiary

The calculations above¹⁵ suggest that even after we adjust for the higher number of children, agriculture-dominant households seem to invest more in the education of their children.

It is also interesting to note the age of the children relative to their level of education. As mentioned previously, a large number of Kenyan children are enrolled in a grade below what might be expected, given their age. The jump from primary to secondary school is especially important because fees are much higher for the secondary level, and some parents intentionally make their children repeat primary grades until they can afford the expense. Indeed, 93% of secondary level-age children (between 14 and 18 years old) from agriculture-dominant households are still in primary school. The percentage is slightly lower for other rural households (86% for part-time farmers and 83% for other rural households), and much lower for urban households (55%).

Kenyan, and agriculture-dominant households in particular, care about the education of their children enough to make large financial sacrifices to send them to school. School-related expenses account for a large proportion of households' income and are thus a significant financial burden. This burden, which is apparent in some of the qualitative responses and in our finding that many children are enrolled below the appropriate grade, might in fact be more than the families can bear. We came across cases where respondents chose to send their children to private or boarding schools that they simply could not afford.

Some respondents "stretch" their budget so much, and sometimes so unrealistically, that they leave no cushion for unexpected expenses, such as medical bills. When these unexpected expenses arise, they force families to delay payment of school fees, make extreme sacrifices, or even withdraw the child from school. One such example comes from one of the respondents who decided to send one of their children to an expensive secondary school using the money given to them at the end of the Diaries as a thank-you for participation. The money was only enough to pay for the first installment, yet the family had no plan for paying the fees in the future. They knew full well that they could not afford that school, yet they decided to take a chance and enroll their child anyway.

This type of behavior may also reflect the belief that investing in education for long enough so that the child can attend post-secondary schooling will eventually pay off. Investing in a child's education at any cost, in the hope that he or she will eventually help the family and younger siblings, is likely perceived to be even more crucial by households relying heavily on agriculture. Dividing the small land holdings of these farmers among their children would simply leave too little for each child – not enough to make a living. The great sacrifices families make to pay school fees supports the idea that farmers recognize the need for their children to expand their possibilities in life, so that at least some of them will be able to move away from a livelihood dependent on farming.

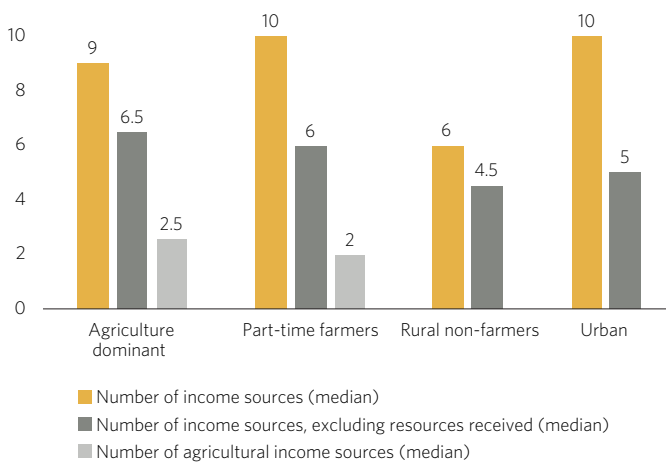
¹⁵ We calculate per-child expenses by dividing expenses by the number of children in kindergarten or primary, secondary or tertiary education, after discounting children in kindergarten or primary school to account for the lower price of education. Other types of calculations produced similar results.

7. SPENDING ON EDUCATION OVER THE YEAR

School fees and related expenses at least theoretically require timely payment and are a significant burden on the household income. The lumpy and uneven nature of incomes of rural and especially agriculture-dominant households often has implications for the payment of these expenses. This section examines such implications.

What stands out from the data on income is that most households patch together income from a large number of sources. To a certain extent, this is the result of trying to smooth out income and to diversify risk (although families do not necessarily perceive it in these terms) across income sources that are uncertain and volatile. But it's also a matter of necessity. Typically, no individual source generates enough income to meet the entirety of a household's needs.

FIGURE 3: NUMBER OF INCOME SOURCES, BY SEGMENT



Income volatility and efforts to cope with it seem to be even greater in the case of agriculture-dominant households. Over the period of the study, agriculture-dominant households earned income from 9–10 different sources at the median, while the other rural households earned income from 6 different sources at the median. Agricultural income was derived from 2–3 different sources at the median and, on average, the percentage of income from agriculture was 68% for agriculture-dominant households (0% for rural non-farmers—who more closely fit the definition of subsistence farmers). Many smallholder farming households earn agricultural income from selling milk, fruits, trees, or even cereals, which in fact bring in smaller and more constant streams than other types of crops.

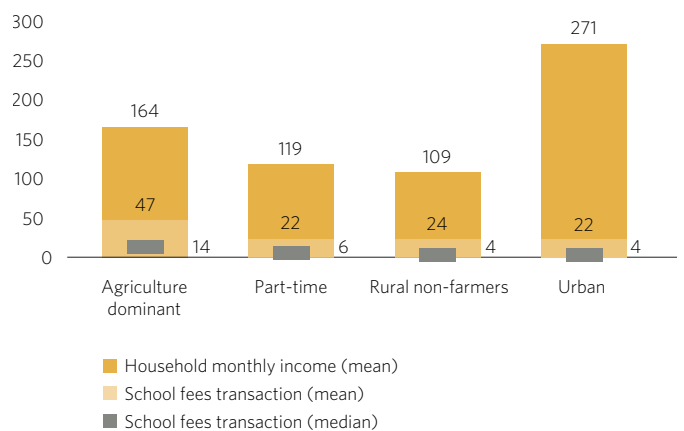
TABLE 5: STANDARD DEVIATION OF MONTHLY PER-CAPITA INCOME (US\$)

	STANDARD DEVIATION OF MONTHLY PER-CAPITA INCOME	
	Mean	Median
Agriculture-dominant	US\$40.10	US\$17.70
Part-time farmers	US\$25.70	US\$13.30
Rural non-farmers	US\$34.80	US\$10.60
Urban	US\$61.30	US\$34.70

Nonetheless, despite diversification, as shown in Table 5, our data offer some support for the idea that agriculture-dominant households have more volatile incomes than other rural households, but not urban households.¹⁶ For more details on earnings and a comparison of agricultural income and other income sources, see Annex 2.

A look at the size of school-fee transactions and installments shows that agriculture-dominant households have the largest school fee transaction sizes: US\$14 at the median and US\$47 at the mean—two times larger than transactions made by the other segments. These transactions are considerable, especially when compared with household income (Figure 4). The larger transaction sizes for agriculture-dominant households may in fact be a consequence of their lumpier incomes.

FIGURE 4: SCHOOL-FEE TRANSACTION SIZES RELATIVE TO HOUSEHOLD INCOME (US\$)

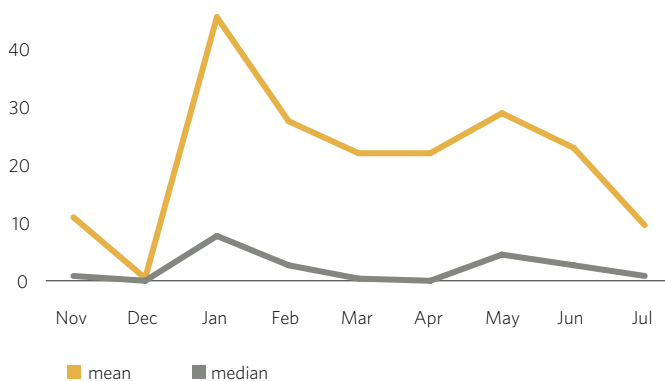


¹⁶ Standard deviations for income are higher for urban households, likely because they are calculated on the basis of much higher incomes.



Rural households (the pattern is similar if we consider only agriculture-dominant households) pay school fees throughout the year, with a spike in January, a second in May, and nearly no payments in December. For agriculture-dominant households, the average proportion of income spent on school fees in January and February jumps to 20% and 15%, respectively. It should also be kept in mind that these are generally poor families with little disposable income, thus these expenses loom larger.

FIGURE 5: RURAL HOUSEHOLD MONTHLY SCHOOL EXPENDITURE OVER THE YEAR (US\$)



On a monthly basis, the picture of school payments relative to income is quite dramatic. Over the duration of the study, for some households school expenses amounted to two or three times as much as monthly income during certain months.

The fee-payment system is designed to request and receive certain amounts of payment at specific times of the year. In reality, this does not happen. School fees are paid in installments of various sizes throughout the year. Owing to the fact that many parents simply cannot afford to pay the fees when they are due or in large installments, schools are forced to accept multiple partial payments, delays and discounts. In qualitative data, we see considerable evidence that parents scramble to come up with at least the minimum amount that would allow their children to stay in school, and in many cases they do this only after a child has already been sent home. Even so, school fees are an important expense for poor households with highly volatile incomes.

8. FUNDING EDUCATION

School fees are a huge concern, and much on the minds of the people of Kenya. We found that these expenses are so large that in some cases they are beyond the means of a household even if they were to employ the best financial planning and show great restraint in spending money. In fact, the qualitative data show that because these expenses are overwhelmingly high, respondents lack a clear long-term plan for paying them. They simply hope that something will come up when the time arrives. When asked what their plan is, some even mentioned God's will.

BOX 4: PERSPECTIVES ON HOW HOUSEHOLDS WILL FUND EDUCATION

“My daughter will be joining class seven, so school fees will go up. I am not sure how I will handle that. I need a house desperately but I don't know if I will start constructing it in the next year with my current state of finances.”

Single, female, part-time farmer mother of four children

“School fees [next year will be] about KSh45,000 (US\$531). Not sure where all these would come from but I hope to receive help from my children.”

Part-time farming household with four children and grandchildren in school and one adult daughter attending vocational training

“School fees [next year will be] KSh69,000 (US\$814) [for two of my children]. I am not sure where this [money] will come from. [But I] know they will go to school. [I have] some sugar cane which I hope it will earn me some substantial income. [There will also be] college fees which I cannot tell how much [will] be. The children might have to wait.”

Part-time farmer household with 4 children attending school, two at the secondary level

It is clear, however, that the lack of a clear long-term plan is not the consequence of negligence or carelessness. In fact, most respondents show sophistication and restraint, and they put quite a lot of thought into budgeting to meet their needs.

BOX 5: SOPHISTICATION AND RESTRAINT WHEN BUDGETING FOR EDUCATION

“[...] I have learned that when you get money, you should use it within the plan and needs. If I do get a little money, I plan for it to meet the needs, not that I am happy with it, but I plan for it. I later realized that the way you plan for your money matters.”

Samantha, a 28-year-old single mother of three

“The days when I get the casual jobs, no matter how much I am financially drained, I have to keep something even if it is fifty or twenty shillings until the day it will be enough.”

Danielle, a 31-year-old single mother

However, we see that even when there is a plan, some of the strategies envisioned for paying school fees in the future are not realistic. For example, the plan of a part-time farmer to sell KSh30,000 (US\$354) worth of maize to fund education is very unlikely to be feasible. A large number of respondents say they plan to fund next year's school fees through loans, although it is often far from certain that they will actually receive some of these loans.

Assessing sources of funding during the period of the Diaries and discussing plans for the future in qualitative interviews, it is evident that both urban and rural households employ a variety of financial and—importantly—non-financial strategies to come up with money for school fees. What most of them have in common is that they use multiple sources of funding, many of which are uncertain, and that they lack long-term strategies or plans for paying school fees. It often comes down to a last-minute struggle to obtain the money.

8.1 NON-FINANCIAL STRATEGIES

Although some respondents have a plan for obtaining the money to fund school expenses, in many cases the source is not very secure. It usually depends on agricultural yields, finding a casual work or relying on the generosity of family or community members. Receiving and offering support to friends and family in the form of remittances and fundraising in the community (harambees) are customary practices. In Kenya, families sometimes find an education “sponsor” for a child. The sponsor could be an organization, but is often a family member or a father who is no longer living with the child’s family. Resources received from outside the household are often used to pay part or all of school fees or other school-related expenses. Diane, for example, a 42-year-old widow who depends primarily on agriculture, lives with her granddaughter. She reports that the girl is in day school, but that Diane never pays her school fees because a church has agreed to finance her education.

As a share of total household income, remittances play a major role for part-time farmer households (40%), while they are much less significant for agriculture-dominant households (2%) and other rural households (16%). See income details in Annex 2.

When asked whether the money received from outside the household was intended for specific purposes, 13%–16% of households across all segments (including urban households) report receiving money intended specifically to help them with school fees and related expenses. Many respondents indicated that such help is crucial for their children’s education.

BOX 6: RELIANCE ON FAMILY TO PAY SCHOOL FEES

“School fees [will be] Ksh25,000 (US\$295) plus another Ksh15,000 (US\$177). I will probably increase looking for support from family and friends.”

Samson, part-time farmer

“School fees [will be] Ksh4,000 (US\$47). This will come out of my and my husband’s casual work income.”

Veronica, part-time farmer

“I am thinking of taking my children to a private school which would cost Ksh1,600 (US\$19) per month. If my husband and my daughter keep sending remittances, it would take care of this.”

Patricia, part-time farmer

“School fees [will be] Ksh100,000 (US\$1,180). My husband will send us money little by little, and we will pay in arrears once the children join college.”

Marietta, a mother from a non-farming rural household

“My daughter would not have gone back to school as she was sent away from school. Her uncle Andrew sent the money purposely for Winnie’s school fees.”

Aurelia a married urban mother with four children in school (from kindergarten to secondary)

“He [a brother] has supported all the children through school and college and without his help this would not have been possible.”

Jane is a part-time farmer who currently has one child in kindergarten and three others who no longer attend school, one of her older children graduated from college.

Smallholder farmers may sell agricultural products to cover school expenses, but they often rely on more complex strategies. Such strategies are usually based on multiple sources and reflect complex planning and judgment. A lot of choices, sometimes hard, need to be made.

BOX 7: MULTIPLE SOURCES AND COMPLEX PLANNING TO PAY FOR EDUCATION

“I have to plan for the money, to know where to take one portion, another portion, and another portion. In case I do not plan that way, maybe a child can be sent from school because of lack of school fees, or I might end up using all the money like eating it in the house, so I have to make sure that I plan for it.”

“We have trees that we sell to pay for school fees. [...] the bull that you have just seen there we want to sell it in December because we have a child who is in class eight. We are hoping that the money we will get, some of it we will buy a small calf and the rest we will use it as school fees when she is going to join form one.”

Lana, a 36-year-old mother from a part-time farming household

“Let’s say [...] I will get four thousand, but I do not have it now but I will get it after [chang’aa] is ready. I am not sure if the children are going to [be able to] go back to school on Monday but for the class eight child I have finished paying school fees. So, I am going to pay two thousand for the one who is in form two, then one thousand two hundred is the one that I will set aside for the next brew, and the remaining we will use in here in the house to buy the house hold.” *Lana also tells us that she takes odd jobs when they are available.* “I am working extra hard even if people call me to go and do work for them I go very fast because I want to get that money so that I can make sure that my kids are in school.”

Lana is also a brewer. She sells chang’aa- an illicitly brewed alcoholic beverage in the village and uses part of the profit to pay for education.

“When it reached time to pay school fees, he (the neighbor) would give me something like five hundred to take to school, [...] but when I reached form two, in terms of school uniforms, shoes, it was too difficult.”

Dan is a 25-year-old part-time farmer. He managed to finish high-school, the highest level of education achieved by anyone in his household. He tells us that although he received support from his family, he had to do “vibaruaas” like digging in other people’s farms in order to be able to pay for his school fees. He had to ask for help from friends and neighbors. Upon his father’s death, when Dan was in the eighth grade, an older brother stole and sold Dan’s inherited land. However, at least Dan received a calf from his father’s first wife. Dan raised the calf for several years and at the end of high-school, he sold it for KSh25,000 (US\$295). He used the money to repay most of his school debt. The remaining debt, KSh2,500 (US\$30) was covered by Dan’s mother from chang’aa sales.

Working through school is not uncommon, but it cannot be the only source of money, even for urban respondents who are lucky enough to find more productive jobs. Martin, for example, is a 23-year-old university student from an urban household. He too was sponsored by a church to go to high school, but now that he is in university, he has to pay his own expenses. He cobbles together the money to pay for school from different sources: he receives scholarships; an older brother helped him for a while, although he no longer does so; he befriended a wealthy lady whose brother gave him some money for school fees; and he also has an online job. He says that he cannot afford to buy a laptop, which would help him make more money from his job. Whenever he manages to earn more money, say KSh20,000–KSh30,000 (US\$236–US\$354), he puts it towards school fees. Nonetheless, at the time of the interview he owed money to the university and was worried that he would not be allowed to take his upcoming exams.

8.2 FINANCIAL STRATEGIES

When discussing plans for coming up with money to pay the next year's fees, respondents bring up financial strategies, which are often used in conjunction with non-financial strategies.

Very few (only 4 out of 300) households in the sample have school loans, two of them agriculture-dominant and one a part-time farmer's household. Their total school loans range from KSh50,000 to KSh92,000 (US\$590–US\$1,086). The one non-agricultural household that had borrowed money for school had a much smaller loan—KSh5,000 (US\$59). School loans are no more common among urban households (only one had such a loan). In addition to loans intended for school fees, there is also a school fees savings instrument, but it was used by only 3 rural households, and the amounts saved were not significant. However, field evidence shows that in some cases households take out loans supposedly for other purposes, such as investment or consumption, but in fact use them to pay school fees.

Some respondents tell us that they use formal financial instruments such as banks specifically for the purpose of saving money for school fees. Take the case of Mary, a single mother from a rural but not agriculture-dependent household: “[I save money with Equity Bank] because if it were not for that money my children could not have gone to school, since now they are in boarding school. I had to withdraw ten thousand shillings to take them to school.” At the time of the interview, Mary did not owe money for fees and was planning to pay the next round of fees with her share from a chama (a savings club). Another urban respondent said that he had recently started to save KSh1,000 (US\$12) per month in a SACCO and that he will use the money to expand his house, but perhaps also for his child's school fees.

John, a part-time farmer with three children in primary school and kindergarten, says that whenever he has some leftover money, he puts it into his M-Pesa account. The goal is to keep this money for emergencies, for example if a child is sent home from school, and perhaps to pay for secondary school once his eldest child starts.

Clearly, school fees are a predictable expense; accordingly, it would be possible (and wise) to put money aside in advance. However, we see that families often fail to plan ahead for school fees. Roger Thurow, in his book “The Last Hunger Season,” offers several accounts of the heartbreaking struggle of parents trying to come up with school fees in rural Kenya, but also describes how such parents often fail to plan ahead. Several reasons, which may not be mutually exclusive, can be put forward to explain this attitude.

BOX 8: PLANNING FINANCIAL STRATEGIES FOR EDUCATION

“I am not sure which school they will join and what the fee structure will be like but if it is too much, I will take them to a school where I can manage to pay with the savings I have in the house.”

Rebecca, from an agriculture-dominant household with five children attending primary or secondary school

“School fees [will be] Ksh120,000 (US\$1,416). I will borrow Ksh80,000 (US\$944) from Equity bank and I will sell a cow [to cover the difference].”

Daniel, from an agriculture-dominant household, has a son and a daughter in college

“School fees [will be] Ksh100,000 (US\$1,180): 3 children who will join form one. [I will take] a loan and depend on resources received from family members to meet the rest of the money.”

Mercy is an agriculture-dominant respondent. She has seven children, all currently attending primary school or kindergarten

“School fees [will be] Ksh15,000 (US\$177). I will get money from kibarua and saving from SILC (Savings and Internal Lending Communities).”

Joel is from an agriculture-dominant household and has a young son

A first possible answer involves the psychology of scarcity.¹⁷ The poor are always under pressure because of a lack of money, and always putting out financial “fires.” So they delay payments until they are unavoidable. Parents may not even see such disruptions as being damaging to their children’s education to the extent that they are.

Another explanation might come from a deep cultural belief that “money has to work,” as field researchers have found. In other words, respondents think that money “unused” for productive ends is money lost (although it could be argued that savings to avoid hardship later is money “working”), and the available savings instruments do not offer enough, if any, interest. Thus, school fees are paid only when they cannot be postponed any more — when the child gets sent home. This type of behavior can be seen as rational and utility-maximizing, especially if the cost of children missing school days is not perceived to be very high.

A related finding is that fees sometimes go unpaid and children get sent home even when households actually have money, according to their balance sheet. However, the money may not be liquid or immediately accessible for a particular need. For example, savings with an MFI may be unavailable for withdrawal when serving as collateral for an outstanding loan. ROSCA and ASCA payouts can only be claimed at certain times or if the member is able to negotiate an early payout with the other members. Such longer-term, less liquid savings reflect patience and determination to achieve certain goals. But they are not the best approach for paying school fees.



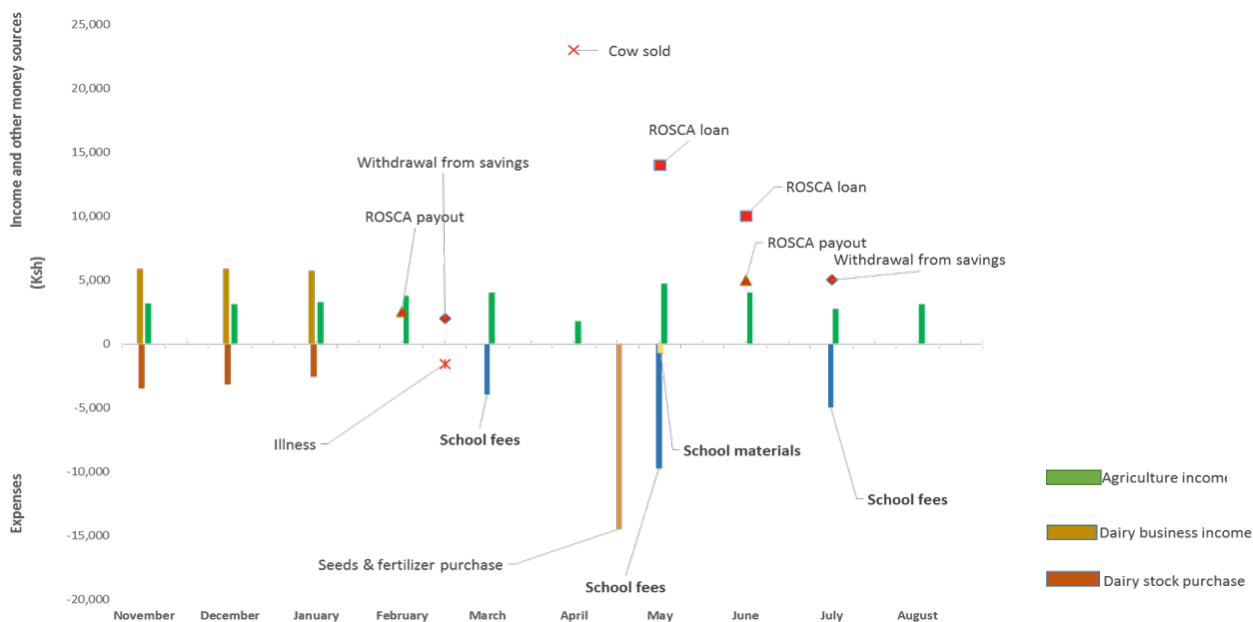
¹⁷ Mullainathan, Sendhil and Eldar Shafir (2013) *Scarcity: The New Science of Having Less and How It Defines Our Lives*. New York, NY: Times Books.

8.3 CASE STUDY: A LOOK AT THE JUGGLING ACT

The cash flows of Daniel's family over a period of several months are a good illustration of complex financial and non-financial strategies used to plan and account for large expenses such as agricultural inputs and school fees, and to deal with minor health

emergencies. Although the household is agriculture-dominant, its income is relatively steady; thus, in a way, there is one less financial issue to deal with.

FIGURE 6: INCOME AND MONEY SOURCES (KENYAN SHILLINGS)



BOX 9: CASE STUDY OF JUGGLING AGRICULTURE, SCHOOL FEES AND EMERGENCIES

Daniel is a 68-year-old farmer with a large family: He lives with his 51-year-old wife, 8 children, 1 daughter-in-law and 3 grandchildren. They grow maize and avocados and raise cattle for milk. Daniel's wife and a daughter have another business selling milk, and occasionally they work for other farmers. Maize is their main income source.

Daniel and his wife come from a farming background. Daniel attended school for three years, after which his father refused to pay his school fees. His wife is not educated either. However, Daniel values education. Although happy and proud of his accomplishments, he says he cannot consider himself successful until all his children are educated and have graduated from school. He believes that his children's success depends on their own hard work. When talking about his own future, he observes that he has come to an age when he needs to start relying on his children.

Five of the six children and grandchildren are of school age and are in fact attending school, although at the primary level—including

Jeffrey, who is 18 years old and in 8th grade. School fees represents a large proportion of Daniel's household income—on average nearly 28%. During the period of the diaries, the children were never sent home from school. The family saves money in several savings groups, ASCAs and ROSCAs, and one of these groups is dedicated to education expenses.

However, juggling household expenses, investing in agricultural inputs, paying school fees and taking care of emergencies is not an easy task. Figure 6 below schematically shows Daniel's family's streams of income and main financial transactions as compared with their agricultural and school-related expenses. During the period, one of the family members needed medical care. Before buying seeds and fertilizer, the family sold a cow.

When asked about his plans for the next year, Daniel said he hoped to install electricity in his house but that his main expense will be school fees, especially since another one of his children will start form 1. He estimates that he will need about KShs60,000 (US\$708) for education expenses. He hopes the money will come from selling maize.

9. UNPAID AND DELAYED FEES LEAD TO DISRUPTIONS IN EDUCATION

As shown, school fees and expenses can be significant. Because households often lack the money when fees are due, those fees and school expenses are often paid late.

Samantha is a young, single, urban mother with three children in school – two in primary school and one in kindergarten. She is quite poor but proud of her determination to reduce her level of debt, although school fees are another matter. She says *“if I am in hunger [...] they won’t know, and I am not in debt. It can only be school debt but not [a debt to] someone.”*

A worrisome consequence is that her children are frequently sent home from school, since the schools do not have any “warning” system in place—once the delay is deemed unacceptable, the child is sent home. In many cases families have to come up with at least a small part of payment or negotiate a deferral with the school.

Throughout the Diaries, in each interview we asked whether any children had been sent home since the last visit. Among rural households, we find that children were sent home (for different durations) during approximately 10% of the two-week periods covered by the interviews. The incidence was slightly higher among agriculture-dominant households. Children from some households were sent home up to 6 times over the study period. It is likely that some children missed even more school days because of issues unrelated to payment, such as sickness, farm work, simple truancy, etc.

BOX 10: CHILDREN WERE SENT HOME

“Pete and Diane were sent home for school fees on Tuesday 2nd of April. Anna took them back to school the same day. She was not able to pay the fees but she talked to the headmaster who agreed to let them back in school.”

“Duncan was sent home because of having school fees arrears. However on arriving home, Mariana told him to go back and explain they could not raise fees at the moment and so they would have to be patient. The head teacher allowed Duncan back into class.”

Even primary school children were sent home, sometimes for nonpayment of very small amounts.

BOX 11: CHILDREN WERE SENT HOME FOR NONPAYMENT OF SMALL AMOUNTS

“The primary school children have been sent home three times in the two weeks period over the activity fee.”

“Two of the children Amina and Ishmael were sent home, because they lacked 30 and 20 shillings respectively for examination.”

“Athman was sent home due to exams fees of 55 shillings, so the exams were on and he was missing.”

Given that primary school is supposed to be free in Kenya, parents are justifiably upset.

BOX 12: PARENTS ARE AWARE OF THE EDUCATION POLICY

“Regina has been chased out of school due to non-payment of tuition fees. ‘We are not going to pay since tuition is not compulsory, and the government has abolished the same. In fact, we can report them to the authorities.’”

At times, children are sent home because of nonpayment of other types of expenses: lunches, school trips, proper uniforms and shoes.

BOX 13: CHILDREN WERE SENT HOME FOR “PETTY” REASONS

“Aurelia was sent away from school because her shoes were worn out. Her father had to borrow money to send her back to school.”

Often, secondary-school children are sent home for arrears amounting to several thousand shillings. Making a partial payment may cause school administrators to be merciful, but this is not always the case. Sometimes, children end up staying home for long stretches of time.

BOX 14: PARTIAL PAYMENTS AT SCHOOL

“Stan was sent home last week but one (the week before last) for school fees. Ksh3,900 (US\$46) were needed at school, but they paid half of the money, and he went back to school.”

“Raphael and George were sent home because of school fees arrears. Raphael has arrears of Ksh1,000 (US\$12) and, Barbara took him back with KSh500 (US\$6) that she borrowed from Mama Akello.”

“Robert was sent home for school fees on 4th April. He has not yet gone back (as of 6th June) as there is no money. His sister has promised to send some money over the weekend.”

It is not difficult to see that when children are sent home and, implicitly, the practice of postponing payments until they can no longer be delayed or negotiated have negative effects on educational outcomes and on children’s as well parents’ emotional well-being. There may well be a certain level of shame and social stigma, although given the frequency with which this happens the social stigma cannot be very great. Diane, a part-time farmer and mother of four, worries when her children are sent home from school to fetch school fees and no money is available: “*They miss lessons and this impacts on their performance.*” In addition, children are sometimes unable to move on to the next grade, especially to secondary education, because the parents are in a very poor financial situation and the children need to wait another year. The accumulated education certainly erodes over the course of a year.

BOX 15: CASE STUDY OF A POOR WIDOW PAYING FOR EDUCATION

Catherine is a 40-year-old widow who lives with 6 children ranging in age from 7 to 20 years old. She is a tea farmer. Occasionally she earns extra income by doing odd jobs, and sometimes she receives some money from her mother and brother. When her husband died, she was supposed to receive a government pension but so far this has not happened.

Although her family is not among the poorest in the study, their food depends greatly on the maize and milk they produce. Because of a drought, she once lost a large part of her crop. She says that her family has experienced periods of inappropriate food and even hunger.

Catherine went to school until grade 8. She views her only success in life as managing to keep her children in school. However, she has a very hard time doing so. She depends greatly on her brother, and says that she would not be able to send her kids to high school if her brother stopped helping her.

During the Diaries, her children were sent home from school 7 times to get money for school or exam fees or for lunch. Usually, it is because Catherine owes US\$11–US\$13, but on one occasion the kids were sent home to get US\$28. One day, when both a daughter and a son were sent home to get fee money, Catherine was sick and had no money even to buy medicine. However, she managed to sell some tea to pay the fees.

Paying school fees is one of Catherine’s top sources of stress. One of her sons was supposed to start form 1 (grade 9) but she couldn’t afford the fees. In the following year, she hopes she will manage to send 3 of her children to high school. Catherine herself is taking classes on investments, entrepreneurship and business. Paying for them is an added financial and mental burden. She thinks next year her school-fee expenses will be around US\$1,400. She says she will borrow and hope for help from family.

10. CONCLUSIONS

Rural households in general, and agriculture-dominant households in particular, face a triple burden as they seek to ensure that their children are educated in hopes of improving the lives of the next generation. Firstly, their per-capita incomes are smaller, yet they spend proportionately more on education per child than do urban households. Secondly, they have an average of one more school-aged child per household, so their total education bill is much higher every month. Third, their income is more variable, which makes it more difficult to come up with the money when it is needed.

The effects of those strains are reflected in the Financial Diaries data. In agriculture-dominant households, children are more often sent home from school for nonpayment of fees, more secondary-aged children are held back in primary school and school expenses are almost entirely met by sponsors from outside the households. Although agriculture-dominant households are just as motivated as other types of households to ensure that their children are well educated, there is evidence that they are, in particular, less able to provide a smooth delivery of that education. Thus development programs that seek to improve agricultural productivity while also promoting the educational attainment of smallholder farming households are striking at the heart of the burdens borne by these families.

What this analysis cannot tell us, of course, is what kinds of interventions might help. At first glance, one might think that creating a specialized savings or credit mechanism should be at the core of a financial inclusion strategy designed to enable smallholders to meet their educational needs. However, the problem of funding education is not just about finding enough money to meet educational needs—more importantly, it’s about finding the right amount of money at the right time, despite all of the other necessities that command the attention of smallholders. It might be fruitful to explore innovations and pathways that not only enhance the savings and borrowing potential of households so that they can meet their educational needs, but also take into account the timing of education expenditures and improve the transparency with which smallholders tap their social networks. The next goal should be to develop and test these ideas and bring them to market in a sustainable way.



ANNEX 1: SAMPLE AND SEGMENTS

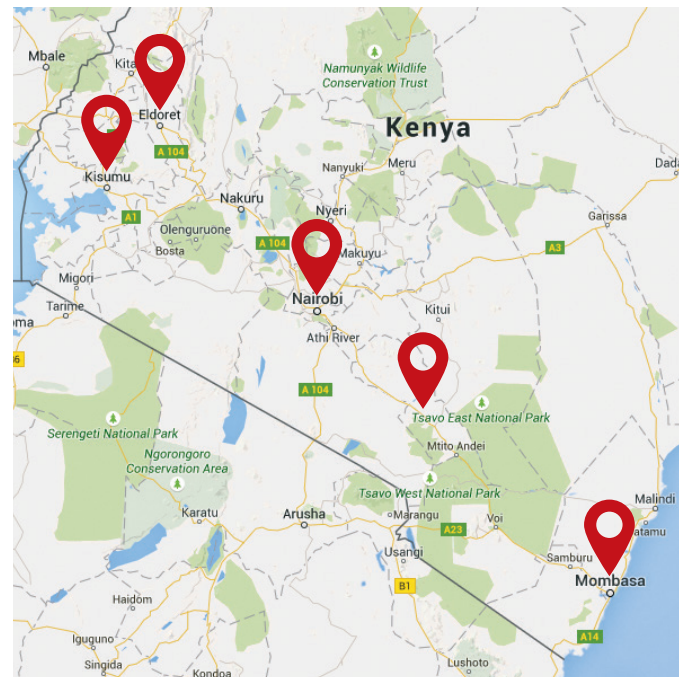
The Kenyan Financial Diaries followed 300 low-income Kenyan households from diverse geographical regions and with diverse livelihood conditions. The project attempted to capture all cash flows of each household for nearly 12 months, between December 2012 and December 2013, thereby allowing us to tell a fine-grained story about respondents' financial lives.

The households included in the study were located in the Eldoret, Makueni, Nairobi, Mombasa and Vihiga regions. Nairobi is the major urban hub of the country; Makueni was selected to reflect rural livelihoods in an area with a history of food insecurity, and in fact was recovering from a serious drought in the preceding year; Mombasa represents the urban environment, a port economy and some of the rural areas where national surveys continuously reveal high levels of poverty; Eldoret has a strong agricultural economy with nearby tea-producing zones, and also serves as an important, though smaller, urban trading center; and Vihiga was chosen to allow us to better understand rural livelihoods in Western Kenya and include households that were members of CARE-trained savings groups.

The sampling of the households was not random, nor intended to be representative of any specific population. We selected households to reflect the diversity of livelihood strategies, income levels (within a low-income range) and household structures that exist across Kenya. Our final sample reflects those intentions, with 31% of households in urban areas and 69% in rural areas, quite similar to the 2009 national census distribution of 32% to 68%. In terms of poverty, 72% of the Financial Diaries households get by on less than the equivalent of US\$2/day. The remainder are still low-income, with 95% falling below a US\$5/day threshold. However, it is worth mentioning that although by the usual poverty standards most would be considered poor, these are ordinary Kenyans. In fact, in the country-specific context, although the respondents could not by any means be considered rich, very few see themselves as truly "poor."

We once again caution that owing to the sampling methodology and sample size, the results presented in this paper should not be interpreted as representative of low-income populations in general, the Kenyan low-income segment, or Kenyan smallholder farmers. As mentioned above, the results of our analysis of the Financial Diaries should be regarded only as indicators of behaviors, choices and experiences rather than used to make inferences about larger populations. It should also be noted that the small sample size, especially when further segmented (see below), does not, in most cases, allow conclusions to be drawn at a statistically significant confidence level.

FIGURE 7: THE SITES OF KENYA FINANCIAL DIARIES



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ANNEX 2: PROFILES OF AGRICULTURAL SEGMENTS

Agriculture

The regions have different profiles. Many of the Eldoret and Vihiga respondents are tea growers, while some also buy and sell tea grown by others. In Eldoret, some of the families—among the poorest—are landless and hence engage in tea picking for others. In Vihiga, the land holdings of families are very small.

FIGURE 8: REGIONAL DISTRIBUTION OF AGRICULTURAL SEGMENTS

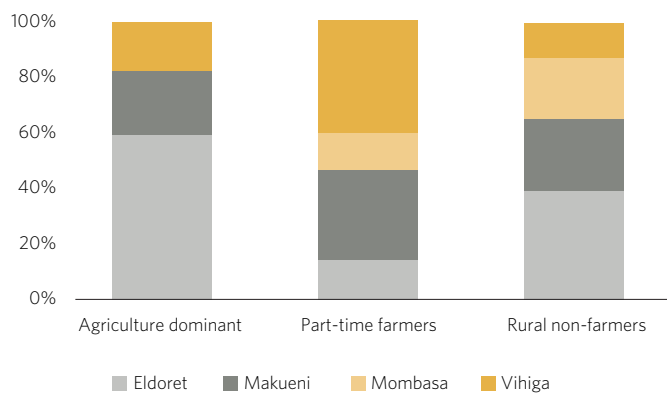
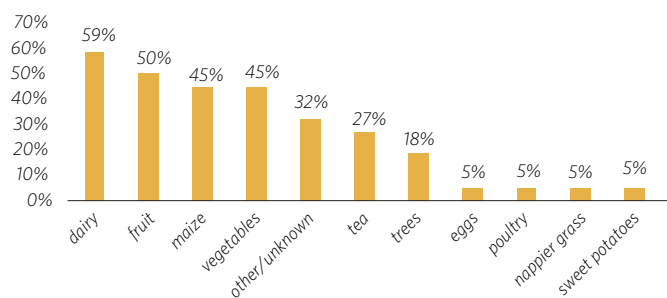


FIGURE 9: TYPE OF AGRICULTURAL PRODUCTS (% of households selling)



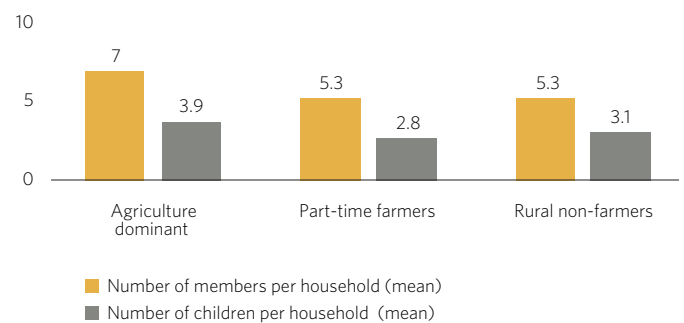
In Eldoret and Vihiga, households grow tea; many of the tea farmers in this area have a side business of buying and selling other farmers' tea. Most of these businesses receive the bulk of their money once a year, in April, as a bonus. Also at one of the Eldoret sites, some families are tea pickers. These families are typically landless, are paid based on quantity picked and are usually extremely poor. In Vihiga, land sizes are so small that few families could earn more from agriculture than they already do. Makueni is interesting because of the large share of rural non-farmers.

The agriculture-dominant households engage in selling various types of agricultural products. Dairy products, various types of fruit (avocados, mangos, bananas, etc.), maize and vegetables are the most common. The only cash crop encountered in the study was tea.

Demographics, housing and physical assets

Agricultural households are typically portrayed as larger and having a higher number of children. This is indeed the case in our sample. Agriculture-dominant families have on average 7 members and 4 children, which puts them above the other two segments by approximately 1.7 household members and 1 child.

FIGURE 10: NUMBER OF HOUSEHOLD MEMBERS, BY AGRICULTURAL SEGMENT



Moreover, agriculture-dominant households are typically headed by males (only 27% of the household heads are females); female household heads are more common among part-time farmers and in the other rural segments.

TABLE 6: DEMOGRAPHICS, BY AGRICULTURAL SEGMENTS

	AGRICULTURE DOMINANT	PART-TIME FARMERS	RURAL NON-FARMERS
Female headed households (%)	27%	61%	57%
Adults age (mean)	39.8	39.7	36.3
Number of members per household (mean)	7.0	5.3	5.3
Number of children per household (mean)	3.9	2.8	3.1

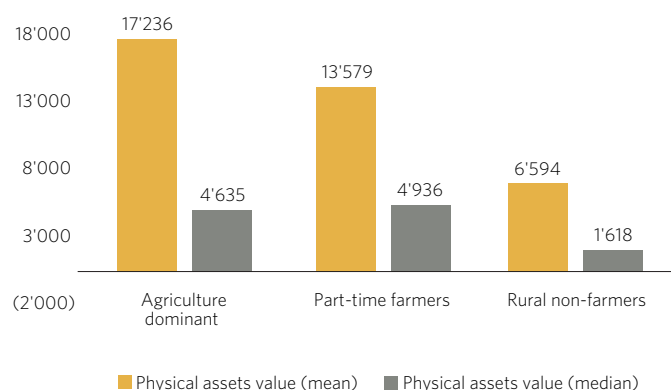
A higher percentage of the households involved in agriculture own the houses they live in—approximately 90% of both the agriculture-dominant and the part-time farmer segments, compared with 65% of the rural non-farmers. In terms of the physical characteristics of the houses, it was not evident that the households involved in agriculture lived in smaller or poorer-quality houses than other rural households.

TABLE 7: HOUSING, BY AGRICULTURAL SEGMENTS

	AGRICULTURE-DOMINANT	PART-TIME FARMERS	RURAL NON-FARMERS
Own house (%)	90%	90%	65%
Room number	3.2	3.1	2.2
Thatched grass roof (%)	5%	9%	13%
Brick or stone walls (%)	38%	41%	38%
Cement floor (%)	43%	36%	44%

The total value of physical assets of agriculture-dominant households is higher, on average, than that of the other two segments. Since physical assets include land, this is not necessarily surprising.

FIGURE 11: TOTAL PHYSICAL ASSET VALUE (US\$)

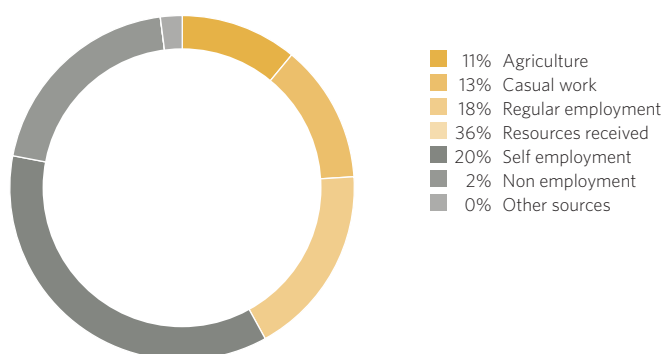


Income dominance and income level by segment

For Financial Diaries purposes, incomes were classified as follows: regular income—received from a steady job; casual employment income—received from odd jobs; temporary contractual employment income—received from short-term jobs (the latter two categories were combined into “casual work” for this paper), self-employment income—received from respondents’ own enterprises such as selling products at a stand; agricultural income—related to agricultural activities; resources received—income received from non-household members as gifts or remittances (this type

of income does not include any type of social security income); and non-employment income received from all other sources—all other types of income.

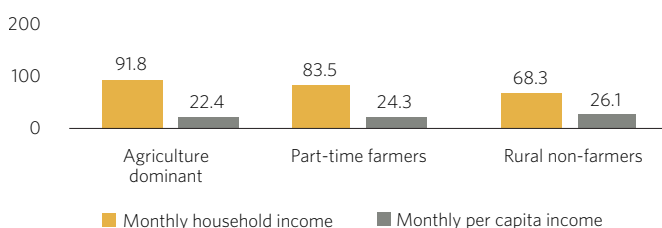
FIGURE 12: DOMINANT INCOME SOURCES FOR RURAL HOUSEHOLDS



Agriculture-dominant households account for approximately 11% of the entire rural sample, while households that rely mainly on resources received from outside the household (remittances and other gifts) represent a share of 35% of rural households. Contrary to initial screening interviews, a much larger proportion of respondents said that agriculture was their main income source (18% of the entire sample, including urban households), while very few (8% of the entire sample) reported that resources received constituted their main source of income. This finding speaks to the level of interconnection and integration between rural and urban households. Many of the resources received come from children who have moved to the city after school and are now helping the family.

We see that at the household level, agriculture-dominant households make a little more money than the other two categories. In per-capita terms, however, agriculture-dominant households appear to be correlated with lower income.

FIGURE 13: TOTAL MONTHLY INCOME, BY SEGMENT (MEDIAN, US\$)



However, it should be noted that these differences are not statistically significant, as there are large differences across households within each segment. To put these findings into perspective, the urban respondents (quite poor themselves) had a median per-capita income of US\$67.20 per month.

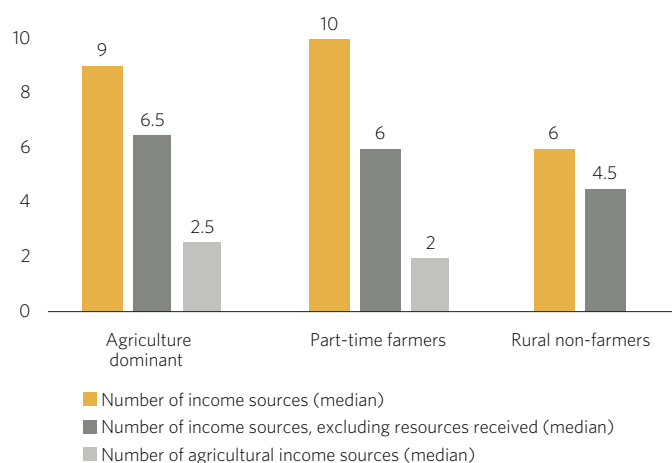
It appears that although agricultural income dependence is not associated with lower per-household income, it is associated with slightly lower per-capita income. However, the differences across the segments are not significant.

Income smoothing and diversification

Agricultural income is expected to be lumpy, as it comes in large but infrequent installments and is subject to many risks – such as crops failing because of natural conditions, losing harvests because of poor-quality storage, prices falling, or an inability to reach buyers.

All the rural households in this study have a large number of income sources. Households involved in agriculture rely on 3–4 income sources more than non-agricultural rural households (at the median) with part-time farmers having the most sources of income.

FIGURE 14: INCOME SOURCES, BY SEGMENT (COUNT)

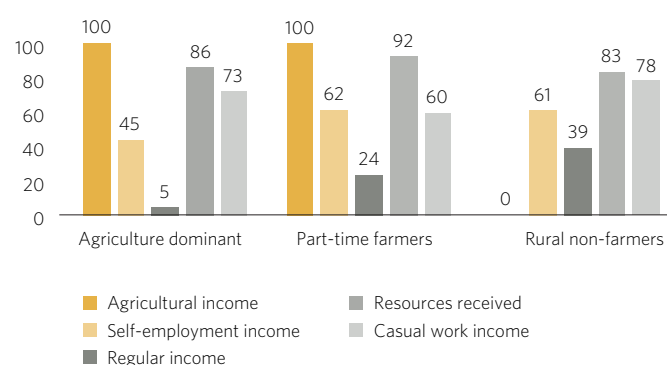


Agricultural households are involved in even more non-agricultural income-earning activities than households with no agricultural income (although this measure includes remittances and other help received from outside the household). However, as suggested by a growing body of literature, farmers' involvement in non-agricultural activities may not reflect an income-maximization strategy, but rather a coping strategy.¹⁸ In other words, it may not be the case that agriculture leaves households with a lot of free time to engage in other activities to earn extra money, but perhaps instead that households sometimes neglect agriculture for other activities (and this lowers their productivity) so as to hedge against the risk of low earnings from agriculture.

In addition to their non-agricultural income sources, agricultural households have at the median 2 and 2.5 agricultural income sources for part-time farmers and agriculture-dominant households respectively. These numbers are likely to understate the reality, as many crops are comingled and reported as one agricultural income. In addition to being involved in many income-earning activities aside from agriculture, smallholder farmers also hedge against income risks typically associated with agriculture by growing several types of crops.

In following income sources in the Diaries, we count one-off sources such as help received from non-household members (as remittances or gifts). To account for the possibility of bias in the level of networks, social connections and remittances (although even these may be construed as risk-hedging strategies), we also compare the number of income sources after excluding these types of incomes. However, agriculture-dominant households still have the largest number of income sources, at the median, followed by part-time farmers.

FIGURE 15: PROPORTION OF HOUSEHOLDS RECEIVING TYPES OF INCOME, BY SEGMENT (%)



¹⁸ See *Seasonal Credit Constraints and Agricultural Labor Supply: Evidence from Zambia*, Fink, Jack, Masyie, 2014.

TABLE 8: SHARE OF TOTAL HOUSEHOLD INCOME, BY SEGMENT (MEDIAN, %)

	AGRICULTURAL INCOME	SELF-EMPLOYMENT INCOME	REGULAR INCOME	RESOURCES RECEIVED	CASUAL WORK INCOME
Agriculture-dominant	68%	6%	39%	2%	17%
Part-time farmers	0%	15%	47%	40%	11%
Rural non-farmers	NA	41%	59%	16%	18%

For agriculture-dominant households, agricultural income represents 68% of total household income (at the median), whereas for part-time farmers it is 0%, meaning that most of them are in fact subsistence farmers. The most striking finding is just how few agriculture-dominant households (in fact only one) have any source of regular income.

Not surprising for Kenya's remittance-heavy culture, we find that a large percentage of households receive help from outside the household. Kenyan households are often part of complex social networks which can and often do help during times of crisis (although this type of coping mechanism is often imperfect), as well as smoothing out fluctuating incomes. However, the other side of the coin is an implied obligation for the household to help others, which can often wipe out savings or put tremendous pressure on the household budget.

Among part-time farmers, nearly everyone receives resources from outside the household, and the importance of this type of income in total household income is significant—40% at the median.¹⁹ For agriculture-dominant households, the importance of remittances and gifts is not very great—they represent only 2% of total household income. Typically, whereas in agriculture-dominant households the husband is more often at home with the family, the husband in part-time farmer households tends to work in the city and send money home.

Involvement in agriculture is associated with a large number of income sources, including non-agriculture sources. Households try to smooth their income and mitigate risks by diversifying crops and patching together income from as many other sources as possible. A large proportion of rural households, regardless of their segment, receive gifts and remittances from outside the household. However, for agriculture-dominant households this type of income makes up only a small proportion of total household income. It is uncommon for agriculture-dominant households to receive regular employment income, but approximately the same proportion as in other segments earn income from casual work—although its importance in total household income is much less than for other segments.

Agriculture as income source

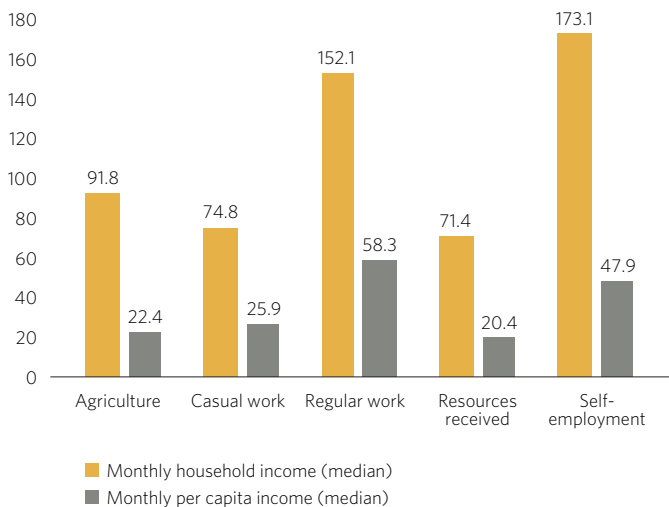
In this subsection we compare the dominance of income from agriculture with the dominance of other types of income. As previously explained, a dominant income type is defined as the income type that brings in the largest share of total household income during the entire study period (not necessarily representing more than 50% of household income).

We compare median total household and per-capita income, based on this dominant income typology. We first computed the average monthly income of each household. At the median, in terms of total household income, agriculture-dominant households are not the poorest; families that rely on self-employment, or on resources received from others, are poorer. However, in per-capita²⁰ terms, agriculture-dominant households are among the poorest. Only households for which resources received are the main income source are poorer in terms of per-capita income.

We should note that when calculating total household income, agricultural and self-employment income were measured as net income by deducting the cost of inputs such as labor, fertilizer, pesticides and stock. This type of calculation, while giving an accurate representation of net income, underestimates the well-being of those agricultural households that also consume some of their production and overlooks the fact that, especially in agriculture, spending for inputs is likely to come from savings (or perhaps borrowing) rather than from that month's income.

¹⁹Per capita income (in this table and all subsequent ones) was calculated using the OECD suggested formula for adult equivalency Audit Equivalent Scale = $1 + 0.7^*$ (No. of adults -1) + 0.5^* No. of children. This formula is not without controversy, however it offers a reasonably intuitive way to account for the lower caloric intake of children, some fix costs associated with living in a household, as well as the economies of scale of living together.

²⁰If the households consume some of the products of their self-employment (for example if they sell chapatis but also eat some of the merchandise), we are likely underestimating their net income.

FIGURE 16: MONTHLY INCOME, BY RURAL HOUSEHOLD DOMINANT INCOME TYPE (MEDIAN, US\$)

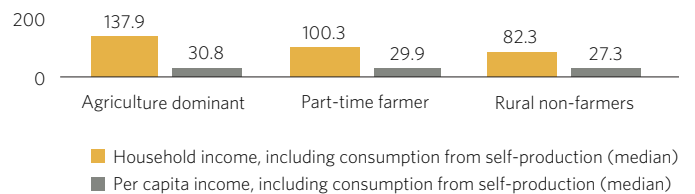
It is important to note that the findings above refer to household income from all sources, grouped by the household's dominant income. They do not refer to income of a specific type. Thus, these findings should not be interpreted as "profitability" of an income type over another, as they may also reflect the household's ability to patch together incomes from multiple sources. Based on the findings above, it appears that relying on agriculture may indeed result in a smaller amount of per-capita monetary income.

To sum up, only a small proportion of our sample depends on agricultural income as the dominant income source. At the household level, agriculture-dominant households are poorer than regular employment- and self-employment-dominant households, but not as poor as households that depend on casual work or resources received as their main income source. On the other hand, in per-capita income terms, agriculture-dependent households are among the poorest; only those dependent on resources received are poorer.

Consumption of households' own agricultural produce

It is important to remember that so far we have not taken into account the consumption of agricultural households' own produce in calculating their income. Although rural non-farmer households may meet a portion of their food needs by cultivating some of it or by raising livestock, it is likely that this proportion is higher for farmers. This section examines data on consumption from self-production to determine its significance in compensating for a lower monetary income. The data on consumption of

self-produced agricultural goods were recorded in the Financial Diaries. The conversion into monetary terms was made using the respondents' and interviewers' best knowledge of market prices at the time of the interview.

FIGURE 17: TOTAL MONTHLY INCOME, INCLUDING CONSUMPTION FROM SELF-PRODUCTION, BY SEGMENT (US\$)

Indeed, once we take into account consumption from self-production (this includes not only agricultural products, but also, for example, products sold by self-employed respondents), it is clear that farmers are far from being the poorest even in terms of per-capita income. Their per-capita income is in fact slightly higher than that of households that are not involved in agriculture, with the caveat that the evaluation of self-production consumption might overstate the true value.

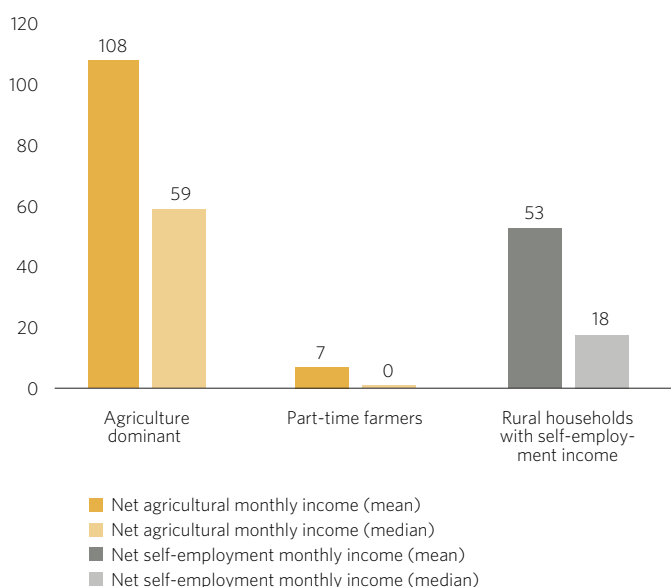
The consumption of self-produced agricultural products helps to make up for lower per-capita monetary income. However, we should not jump to the conclusion that being involved in agriculture is necessarily as profitable as other types of income-earning activities.

Lumpiness of agricultural income

Agricultural income is often portrayed as income received in several (or even one) large installments over the course of the year, usually with a large time lapse after agricultural expenses are incurred. By its nature, agricultural income can also be risky as it depends on a number of factors, many of which are completely out of the farmer's control, such as weather, climatic conditions, pests, theft, etc. Even for (partially) controllable risks, mitigation methods might often be inaccessible to the poorer farmers (insurance, irrigation, etc.).

This section investigates some of the salient characteristics of agricultural income, focusing on aspects related to unevenness. It also contrasts agricultural income with self-employment—a different type of risky and often uncertain type of income.

FIGURE 18: NET INCOME FROM AGRICULTURE AND SELF-EMPLOYMENT (US\$)



Taking into account the fact that agricultural income could be received in large installments and may involve months with no income or—worse yet—only expenses, we find that agriculture-dominant households make on average a mean net income of approximately US\$108 per month from agriculture (although the median is nearly half of that). Part-time farmers earn an average of US\$0 as a group, since although they may sell some of their output, they are basically subsistence farmers.

Self-employment income earned by households in any of our three segments has a mean of US\$52.50 per month and a median of US\$18 per month. Thus self-employment for many households involves very small businesses that do not bring in very large amounts²¹.

As mentioned throughout the paper and in the above figures, we usually consider net income when discussing agriculture and self-employment income. This definition of income subtracts expenses related to the business or to agriculture, making it similar to accounting for profit. However, in the next section we allow for a more nuanced view of these types of income by separately analyzing gross income (positive inflows) and expenses for inputs, labor, stock, etc.

²¹ If the households consume some of the products of their self-employment (for example if they sell chapatis but also eat some of the merchandise), we are likely underestimating their net income.

When we look at gross income (and ignoring any associated expenses), incomes become somewhat more substantial, especially for part-time farmers. Both gross agricultural income and expenses vary substantially across households, even when we consider household-level averages.

On the other hand, a perhaps surprising finding is that agriculture-dominant households earned income, on average, during 90% of the months in the study. This can be explained in part by the fact that many families earn relatively steady streams of income from selling milk and eggs, which are produced more or less throughout the year. Part-time farmers earn income only during 39% of the months. Agriculture-related expenses do not arise quite as infrequently as one might expect. Both agriculture-dominant and part-time farmers incur agricultural expenses during approximately 40% of the months.

TABLE 9: AGRICULTURAL VERSUS SELF-EMPLOYMENT INCOME

	Average gross agricultural monthly income		% of monthly household expenses spent on school expenses	Monthly school expense per child*		Monthly school expense per child*
	mean*	median*		mean*	median*	
Agriculture-dominant	US\$138.2	US\$76.6	90%	US\$(32.6)	US\$(19.6)	37%
Part-time farmers	US\$29.3	US\$11.9	39%	US\$(20.8)	US\$(11.6)	41%
	Average gross self-employment monthly income		% of months with gross income	Average self-employment monthly expense		% of months with expenses
	mean*	median*		mean*	median*	
Households with self-employment income	US\$230.7	US\$68.5	70%	US\$(230.8)	US\$(80.8)	71%

* only for months with income

On average, gross income from self-employment is greater than agricultural income. However, expenses per month are also much larger.²² Self-employed families’ earned income or incurred expenses over approximately 70% of the months. At some level, these findings may reflect the fleeting nature of some of these businesses—some of the households may have started or stopped self-employment during the study.

²² Since the number of months studied is not very large, and self-employment businesses have a more volatile lifespan than agriculture, it is also likely that we are capturing some larger stock purchases that are meant to be amortized later.

To better assess and put into perspective the lumpiness of agricultural income, in addition to looking at month-level income and expenses we also explore the magnitude of agricultural and self-employment-related transactions. The table below shows that in fact, agricultural sales take place in relatively small batches. Although the data show quite a bit of variation, the median transaction size is only a little more than US\$1, even for agriculture-dominant households. This finding confirms the idea that households are often engaged in selling milk and eggs, as well as perhaps crops, when the needs arises rather than in large installments.

The sizes of expense transactions also vary quite a bit, but at the median they are fairly low, both for agriculture and for self-employment

TABLE 10: AGRICULTURAL AND SELF-EMPLOYMENT INFLOWS AND OUTFLOWS

	Agricultural inflow size		Self-employment inflow size	Self-employment inflow size	
	mean	median		mean	median
Agriculture-dominant	US\$10.7	US\$1.4	All households with self-employment income	US\$15	US\$7
Part-time farmers	US\$5.6	US\$1.1		US\$15	US\$7
	Agricultural outflow size		Self-employment outflow size	Self-employment outflow size	
	mean	median		mean	median
Agriculture-dominant	US\$(9.1)	US\$(2.1)	All households with self-employment income	US\$(16)	US\$(5)
Part-time farmers	US\$(9.6)	US\$(4.2)		US\$(16)	US\$(5)

To sum up, agricultural income may not be received in as large installments or as seldom as is sometimes believed. In fact, on average, households receive at least some agricultural income in a majority of the months. Transaction sizes for both revenues and expenses are quite small, reflecting the fact that many agricultural households make sure that they have some relatively stable sources such as selling milk or eggs or vegetables. If anything, agricultural income is less lumpy than self-employment income.

An assessment of agricultural income stability using standard deviation

We have seen that agricultural income may not be quite as lumpy as one might think, at least when all types of crops and livestock incomes are aggregated. In this section, the variability of month-to-month agriculture income is assessed using standard deviation.

Standard deviation is a statistical measure of variability that is computed as the square root of the squared average deviations from the mean.

Not surprisingly, the standard deviation for agricultural income is much larger for agriculture-dominant households than for part-time farmers. In fact, the mean standard deviation is almost as large as the average positive agricultural income.

TABLE 11: STANDARD DEVIATION OF MONTHLY POSITIVE AGRICULTURAL INCOME

	STANDARD DEVIATION OF MONTHLY POSITIVE AGRICULTURE INCOME*	
	mean	Median
Agriculture dominant	US\$138.50	US\$71.90
Part-time farmers	US\$21.10	US\$6.30

*including months with no income

However, as previously reported, farmers smooth income by taking on other jobs—especially during months with low levels of agricultural income. Looking at the standard deviation of per-capita income, agriculture-dominant households have the largest variation in per-capita income, reflecting in part the large standard deviation in gross agricultural income and the large standard deviation in agricultural expenses, but also the lack of more stable income sources such as regular income. However, the difference in per-capita standard deviation is not extremely large, suggestive of the mitigating strategies employed by households.

TABLE 12: STANDARD DEVIATION OF MONTHLY PER CAPITA INCOME (US\$)

	STANDARD DEVIATION OF MONTHLY PER CAPITA INCOME	
	mean	Median
Agriculture-dominant	US\$40.10	US\$17.70
Part-time farmers	US\$25.70	US\$13.30
Rural non-farmers	US\$34.80	US\$10.60

When assessing the stability of agricultural income using standard deviation, we see that there is still variability in month-to-month gross income from agriculture, even when households diversify crops and keep livestock as additional sources of income. For agriculture-dominant households, this instability is only partially offset by other types of income. Overall, these households have the largest standard deviation of per-capita income of the three groups.

ANNEX 3: FINANCIAL PORTFOLIOS BY SEGMENT

As shown in *Portfolios of the Poor*, the poor are active and sophisticated managers of complex financial portfolios. The respondents in the Kenyan Financial Diaries study confirm this finding. In the entire sample, the median number of different financial instruments used by a household over the duration of the study was 14, and the mean was 17.

In this section we explore the financial instruments used by rural households, and by smallholder farmers in particular. Since their income is relatively more volatile than that of other rural households, and they also need to save up to buy inputs such as seeds and fertilizer, smallholders are likely to have specific financial needs.

Since we sometimes make a distinction between formal and informal financial instruments, some clarification may be useful. Typically, classification as formal or informal is based on the existence of a legal infrastructure that provides recourse and protection. Examples of formal financial instruments include savings in a bank and borrowing from a bank. Microfinance institutions are often classified as semi-formal institutions, while examples of informal financial instruments include borrowing from friends and family and saving with a ROSCA.

Financial assets

On average, the rural households use a large number of instruments for saving money. Across the entire sample, the average number of savings instruments is 6.7 per household, the maximum being an impressive 31.

With regard to the number of savings instruments, there are no large differences among the three segments. However, agriculture may still play a role in the types and intensity of usage.

TABLE 13: NUMBER OF FINANCIAL SAVINGS INSTRUMENTS PER HOUSEHOLD, BY SEGMENT

	NO. OF FINANCIAL INSTRUMENTS USED FOR SAVING PER HOUSEHOLD	
	mean	median
Agriculture-dominant	5.4	5.5
Part-time farmers	7.2	6
Rural non-farmer	6.1	5

There appears to be no predilection to use certain instruments among some groups. In fact, the distribution looks fairly similar across the three segments. Among all three segments, ROSCAs (a form of mid-term savings) and mobile money and cash at home

(forms of short-term liquid savings) are the most commonly used forms of financial savings. Lending to friends and family as a way of saving is also common. For farmers it is important to save money for buying inputs (several times a year). At this level of aggregation, there are only insignificant differences across the three groups.

TABLE 14: SHARE OF HOUSEHOLDS WITH DIFFERENT SAVINGS INSTRUMENTS, BY SEGMENT

	AGRICULTURE-DOMINANT	PART-TIME FARMERS	RURAL NON-FARMERS
% of all financial instruments used for saving			
Saving in a ROSCA ²³	21%	25%	23%
Mobile money	21%	17%	18%
Keeping money at home	13%	13%	19%
Lending to friends and family	13%	9%	8%
Checking or current account	10%	6%	5%
Saving in an ASCA ²⁴	10%	12%	9%
Savings account	4%	3%	3%
Credit given to clients	4%	6%	6%
Layaway	3%	3%	2%
Wage or rental arrears owed to respondents	1%	2%	2%

Moreover, it appears that many of the transactions related to tea growing are made through bank accounts. Indeed, the proportion of households with formal bank accounts is higher among households involved in agriculture than among other rural households, although it is still relatively low. Among the 204 rural households in this study, only 38% have a bank account.

Medium-term restricted savings (ASCA/ROSCA) are the most popular savings option among all three segments, without any large differences.

²³ A rotating credit and savings association (ROSCA) is a group of individuals who agree to save a certain amount of money with a certain frequency. At each meeting, one of the group members receives the entire amount (the pot).

²⁴ An accumulating savings and credit association (ASCA) is similar to a ROSCA. However, members take loans, which are called back in at the end of the period, and the entire amount plus profit from interest is distributed back to the members.

²⁵ <http://www.gsma.com/connectedwomen/wp-content/uploads/2013/07/MMU-Infographic-The-Kenyan-journey-to-digital-financial-inclusion.pdf>

The success of mobile money in Kenya is one of the most fascinating financial-instrument stories: 74% of the adult population is using mobile money, according to a 2014 report.²⁵ Much of this phenomenon can be explained by Kenya's culture of remittances, in which many workers in cities send money back home to rural villages. In our sample, we see that approximately 90% of the households have at least one member who has a mobile money account.

TABLE 15: PERCENTAGE OF HOUSEHOLDS USING INSTRUMENTS AS SAVINGS, BY SEGMENT

	AGRICULTURE-DOMINANT	PART-TIME FARMERS	RURAL NON-FARMERS
Bank savings account(s)	55%	40%	26%
ROSCA/ASCA savings	76%	84%	87%
Mobile money	91%	93%	89%

As for transactions into and from savings instruments, agriculture-dominant households are least active (least number of transactions), while part-time farmers are most active, although the differences are not very large. On the other hand, we see large differences in terms of the median values of these transactions. The agriculture-dominant households engage in much larger transactions both in and out of their financial instruments as compared with part-time farmers and especially rural non-farmers.

TABLE 16: HOUSEHOLD AVERAGE NUMBER AND VALUE OF SAVING TRANSACTIONS PER MONTH (MEDIAN, US\$)

	AGRICULTURE-DOMINANT	PART-TIME FARMERS	RURAL NON-FARMERS
Household average per month (median)			
Savings deposits number	1.3	1.8	1.3
Savings withdrawals number	3.6	4.7	3.7
Average household transaction value (median)			
Savings deposit	US\$34.9	US\$19.9	US\$12.4
Savings withdrawal	US\$20.3	US\$10.1	US\$6.5

To sum up, agriculture-dominant households are similar to households from other segments in the number of financial instruments they use that are intended for savings. In fact, at the mean, it appears that they use fewer such instruments. However, agriculture-dominant households exhibit a different pattern of transactions, in that they make fewer but larger deposits and withdrawals.

Financial liabilities

In analyzing the liability portfolios of the three rural types of households, we find that they use a very similar number of financial instruments for credit.

TABLE 17: NUMBER OF FINANCIAL CREDIT INSTRUMENTS PER HOUSEHOLD, BY SEGMENT

	MEAN	MEDIAN
Agriculture-dominant	4.5	4
Part-time farmers	4.9	4
Rural non-farmers	4.6	3.5

Informal borrowing, whether this means borrowing from friends or family or taking advantage of informal credit from a store, is by far the most common type of financial liability. Across all three segments, borrowing from friends and family and taking advantage of credit from a store account for over 50% of all financial instruments used for borrowing. The proportion of households using informal instruments is relatively similar across the segments.

TABLE 18: FINANCIAL CREDIT INSTRUMENTS, BY SEGMENT

	AGRICULTURE-DOMINANT	PART-TIME FARMERS	RURAL NON-FARMERS
% of financial instruments used for borrowing			
Friends and family: borrowing	27%	28%	25%
Informal credit at a store	24%	27%	33%
Arrears owed by respondents	12%	8%	14%
Borrowing from an informal group	8%	14%	5%
Individual business or agriculture loan	8%	4%	2%
Okoa Jahazi (emergency phone credit)	8%	3%	2%
Moneylender or shylock borrowing	4%	3%	1%
School fees loan	3%	1%	1%
Consumer/personal loan	2%	2%	2%
Hire purchase	1%	1%	2%
Payday loan	1%	0%	0%
Supplier credit	1%	1%	3%
Wage advance	1%	2%	2%
Act as money guard	0%	3%	3%

Formal borrowing is not very common among these rural households. In this context we define formal borrowing as borrowing in a regulated form (examples: joint liability loans, wage advance, supplier credit). Among the three segments, the agriculture-dominant households are the least likely to have used formal borrowing over the period of the study.

TABLE 19: SHARE OF HOUSEHOLDS USING FORMAL VERSUS INFORMAL BORROWING, BY SEGMENT

	AGRICULTURE-DOMINANT	PART-TIME FARMERS	RURAL NON-FARMERS
% of households using formal borrowing	32%	41%	44%
% of households using informal borrowing	86%	90%	85%

Agriculture-dominant households do not stand out in terms of their borrowing or repayment patterns. Other rural households repay loans in smaller installments than agricultural households, but the difference is not very large in absolute terms.

TABLE 20: HOUSEHOLD TRANSACTION NUMBERS AND SIZES, BY SEGMENT

	AGRICULTURE-DOMINANT	PART-TIME FARMERS	RURAL NON-FARMERS
Household average per month (median)			
Borrowing repayments number	1.1	0.8	1.2
New borrowing number	0.9	0.9	0.8
Average household transaction value (median)			
Borrowing repayment	US\$4.7	US\$4.6	US\$2.4
New borrowing	US\$6.3	US\$9.9	US\$7.2

As is the nature of data collection using Diaries, we are bound to find more and more transactions as more time passes and the respondents become more trusting and better at recollecting what has happened in the past. However, we find that the number of borrowing transactions is much higher in June and July for agriculture-dominant households, a difference that is not seen in the other two segments. Among agriculture-dominant households, nearly 24% of all borrowing transactions occur in June and nearly 28% in July—the latest months in our data. For agriculture-dominant households, 73% of the borrowing transactions during June and July are informal credit at a store and 20% are supplier credit.

The usage of various credit instruments is not very different across the three segments. However, agriculture-dominant households are somewhat less likely to use formal borrowing than the households in the other two segments. The median value of new borrowing is relatively small—less than US\$7 for agriculture-dominant households.

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