



MILK Brief #35:

“Doing the Math” – Loan Protection for Maize Farmers in Burkina Faso¹

Key Findings. The MicroInsurance Centre’s Microinsurance Learning and Knowledge (MILK) Team studied drought-related costs and financing for maize farmers in Dedougou, Burkina Faso, focusing on farmers’ highly variable cash flow and the role that Allianz’s maize loan protection insurance product played in coping with a drought. We found:

- Vulnerability to environmental hazard extends beyond agricultural yield: though most farmers have diversified their income, farmers rely on agricultural revenue to invest in other income streams and are unable to utilize diverse strategies when yields are low. This finding highlights the importance of insurance to protect against the risk of drought.
- Many insured respondents did not fully understand the insurance product, and our findings suggest that insured farmers may have limited their ex-ante risk mitigation behavior as they expected more from the product. As a result, insured farmers actually relied on more burdensome ex-post strategies than their uninsured counterparts.
- Our analysis suggests that this insurance policy may be linked to an inappropriately designed loan. Relatively low levels of loan coverage compared to a high loan amount due in one large bullet payment (most farmers choose to make 11-month bullet payments on maize loans) reduces the potential value of the insurance by limiting its impact on loan payment relief.
- This is further complicated by our cash flow analysis, which suggests that farmers are actually utilizing significant amounts of cotton crop revenue to pay off their maize loans.

Studying Allianz’s² maize loan protection insurance in West Burkina Faso

Agriculture employs 90% of the labor force in Burkina Faso (CIA World Factbook, 2014), where the majority of farmers are resource poor and produce below subsistence level. Food crops such as maize and cereals, a few cash crops (primarily cotton) and livestock dominate production. Low productivity is largely the result of regional environmental issues: over 82% of land in Burkina Faso is considered non-cultivable due to poor soil quality and desertification (The World Bank, 2014), and average rainfall has decreased by 25% over the past 50 years (Salifu, 2009). On top of these environmental risks, farmers are vulnerable to global market fluctuations, and infrastructure constraints make accessing even local markets difficult.



¹ This MILK Brief was prepared by Barbara Magnoni and Danielle Sobol (June 2014).

² The Client Math study was commissioned by Allianz, with support provided by MILK and GIZ.



Drought is the most variable and detrimental of these risks. Low rainfall affects crop yields specifically, with the consequent effects on household income exacerbated by the closed and interdependent nature of rural economies in Burkina Faso villages. Though most farmers have diversified their income (in our sample, 83% of farmers had at least 1 additional income source in their household, and 16% had 3 or more additional income sources), without income from crops to invest, other businesses suffer. Low yields also dampen demand for goods and services produced in non-agricultural activities, affecting all businesses in rural communities. Consequentially, rains dictate more than crop yield for subsistence farmers in West Burkina Faso – they can determine the economic outlook for entire villages and for the region as a whole.



Allianz's Loan Protection Insurance

In an effort to address the high risk of drought across the region, Allianz, in collaboration with PlaNet Guarantee, offers a variety of insurance products covering different crops for weather risk. Among these is a parametric insurance product³ called *Siman Panga* that protects farmers' input loans for maize.⁴ The product was launched in 2011 and slowly extended in 2012.

This insurance offers loan forgiveness on the basis of a level of relative evapotranspiration (RE).⁵ When the RE level falls under a certain threshold insured maize farmers are forgiven a percentage of their loan based on the production phase, the severity of the event, and their location.

The MicroInsurance Centre's MILK project investigated this loan protection product as distributed through one of the channels working with Allianz, l'Association de promotion de la finance inclusive (APFI), a not-for-profit microfinance institution that serves inhabitants of remote villages in the Dedougou Department of Burkina Faso. APFI offers input loans for all farming activities; however, insurance is mandatory for the portion of the loan used for maize, as long as the loan is disbursed before the end of the initial sales period. After this period, insurance is not available.⁶

Farmers can choose between a lump sum (bullet) loan repayment after 11 months and regular monthly payments, both at a 2% monthly interest rate. The majority of farmers choose bullet payments (93% of our sample pays in this manner). Those who purchase insurance can deposit a lower level of collateral savings on the loan (only 10% of the maize loan compared to 20% for the uninsured) and pay a 10.8% premium upfront for the insurance. Clients typically insure loans of about CFA 100,000 (USD 222) per hectare of maize.

Methodology

In May 2014, the MILK research team travelled to the Dedougou Department in Burkina Faso to interview maize farmers about the cost and benefits of APFI input loan insurance. The research utilized the Client Math methodology (See Box 1: CLIENT MATH) to investigate the client value of this microinsurance product.

The team targeted two groups of APFI loan recipients, all of whom suffered through a drought in 2012. It is worth noting that the 2012 drought was not considered a severe drought on the RE index (see Box 2). We

Box 1: CLIENT MATH

Client Math uses in-depth interviews of low-income people (some with insurance and some without) who recently suffered the same insurable shock. We quantify the full cost of the shock, as well as the financial response, exploring the role insurance played in helping clients deal with the financial burden.

³ Parametric insurance offers a benefit upon the occurrence of a specified triggering event (rather than indemnifying a loss).

⁴ Allianz and PlaNet Guarantee offer additional drought protection policies as well, including a cotton policy and a cash insurance maize policy. The loan protection maize product was chosen for this study because it is the most commonly sold of these products.

⁵ Evapotranspiration is the cumulative effect of evaporation (the process by which water moves from the earth into the air) and plant transpiration (the process by which water is lost as it moves through a plant).

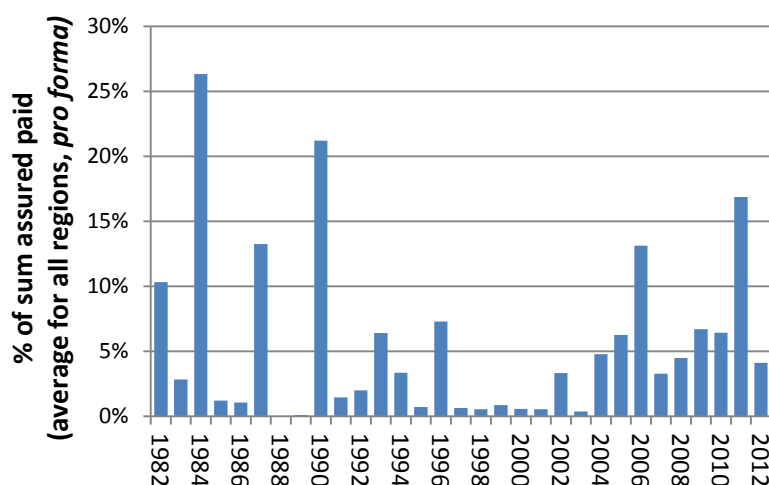
⁶ The maize insurance offered through APFI represents 28% of the maize insurance offered by PlaNet Guarantee / Allianz and 22% of all insurance they offer in the region.



spoke with 81 respondents: 41 who had purchased Allianz' loan protection insurance during the 2012 season and 40 who had not, as they got their loans outside of the sales period. The former group of farmers was interviewed in order to assess the role insurance played in coping with drought-related costs, while the latter was interviewed in order to assess how APFI clients were able to cope with the drought in the absence of insurance. As such, we included a detailed analysis of each respondent's household cash flows and income diversification strategies as part of the study. It is worth noting as well that some of the differences outlined between the two groups in this paper may be related to the fact that uninsured loan recipients received their loans later than the insured.

Box 2: The 2012 Drought

Pro-forma historical payouts per year, 1982 to 2012
Maize LateStart in Burkina Faso



The previous 30 years of relative evapotranspiration data indicate that the drought in 2012 was a relatively moderate one, triggering an average payout (across 318 locations) of about 4% of the sum assured. Pro-forma calculations, shown in the figure, indicate that the triggered payouts would have been greater in several of the prior years, due to relatively more severe droughts. This reflects PG's strategy of having a trigger that provides a higher frequency of payouts in order to educate the market and build trust, but a lower coverage level to maintain relatively low premiums.



The team worked with APFI claims data and client listings to select a list of both insured and uninsured respondents. While the insured clients were randomly selected from 2012 claims data, their uninsured counterparts were selected based on their similarity to the randomly selected insured group. Through a partnership with Facts International, the MILK team conducted the 81 tablet-based surveys in the villages of Fakouna and Lah, as well as two focus group discussions with farmers in Fakouna.

Who are the respondents?

Respondents were sampled from the villages of Lah and Fakouna in the Dedougou Department. Both villages suffered from the 2012 drought; however, the evapotranspiration index triggered during the seeding phase in Lah and during the vegetative phase in Fakouna, affording Fakouna insurance clients a slightly higher payout as they likely had greater losses. Table 1 summarizes some of the important socioeconomic and demographic characteristics of the sample. Differences between the insured and uninsured samples were generally small and in all cases statistically insignificant, suggesting that the sample is appropriate for comparison.



Table 1: Socioeconomic and Demographic Characteristics of Respondents

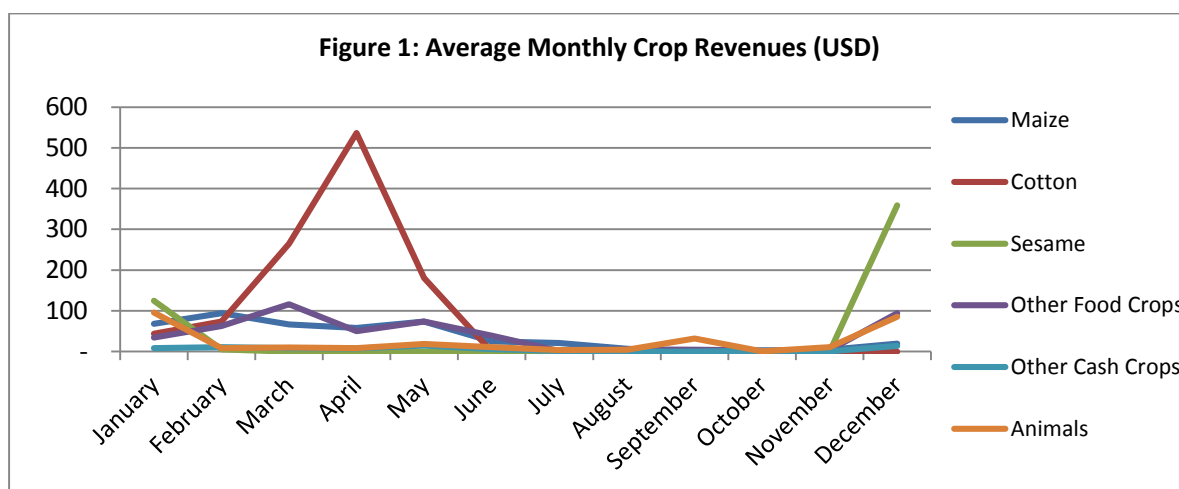
	Insured (n= 41)	Uninsured (n= 40)	p ⁷
Village			
<i>Fakouna</i>	20	21	
<i>Lah</i>	21	19	
Age	43.1	46.3	0.16
Household Size	13	12	0.23
Farm Area	11.5 ha	11.1 ha	0.74
% Farm Area Dedicated to Maize Production	19.9%	19.3%	0.70
Yearly HH Income ⁸	USD 2,735	USD 3,191	0.40
APFI Loan Size ⁹	USD 320	USD 302	0.87

Farming: Risky Business

Cash Flow

Our surveyors asked respondents about the sources and uses of monthly cash flows to ascertain their income volatility and diversification. The high variability of income and the relatively stable nature of expenses throughout the year compound the environmental hazards associated with farming. Figure 1 shows average monthly income by crop, and Figure 2 shows the average monthly income and expenses for respondents in this study.¹⁰

The largest source of agricultural income is cotton (on average USD 1,095 yearly), followed by sesame (on average USD 481 yearly) and then maize (on average USD 440 yearly). Cotton also appears to have the highest levels of variability, characterized with one high “spike” in April. Overall, farmers’ income is inconsistent, and largely non-existent from June through September.



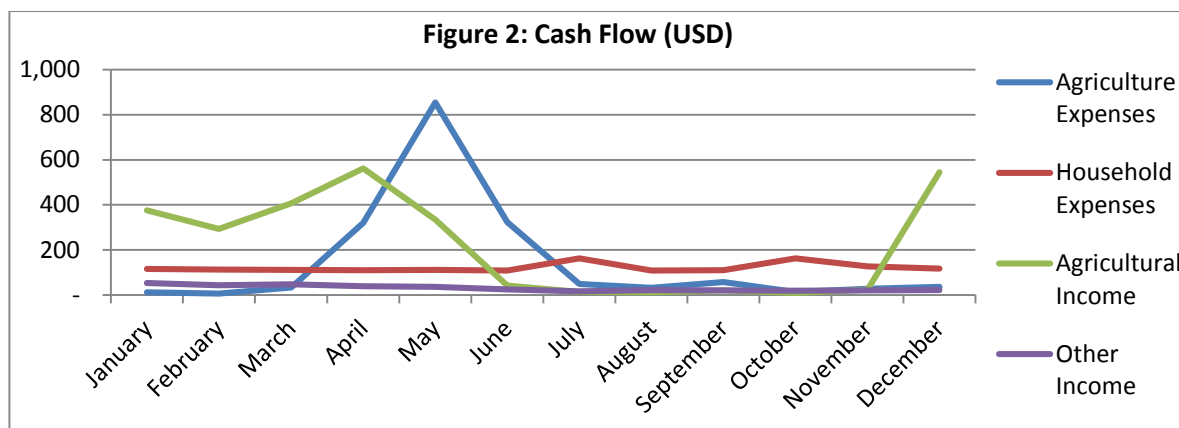
Agricultural expenses vary in line with the agricultural income cycle: farmers spend the most following agricultural revenue peaks in April, mostly as a result of one large outlay in May when they pay off their input loans. Other household expenses remain consistent throughout the year, with two small spikes in July and October when school fees are paid.

⁷ A p-value below 0.05 indicates a statistically significant difference between the two groups.

⁸ All income and expense estimates exclude one outlier that skewed the averages in this small sample.

⁹ This figure represents the average loan size that respondents take out from APFI each season.

¹⁰ Income from animals may be underestimated, as animals are generally sold when they are fully-grown or in response to a crisis. This inconsistency is hard to capture when assessing cash flow.



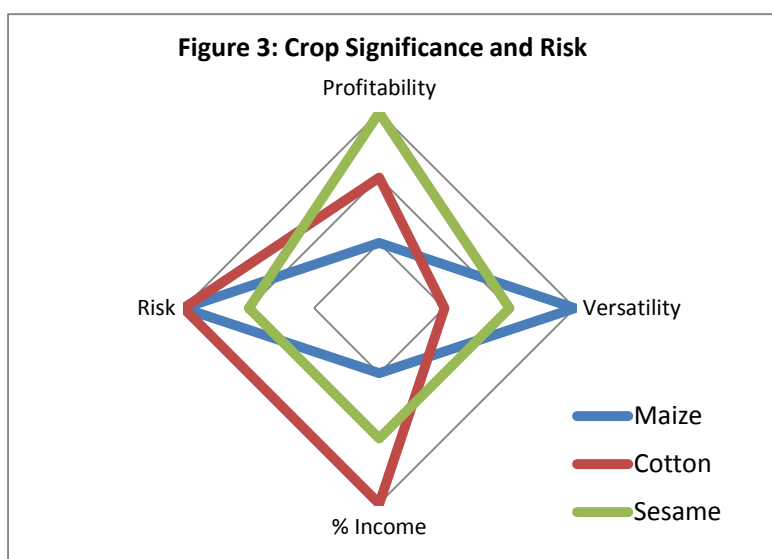
Because agricultural income is often used to invest in other businesses, an agricultural shock can make the lean months even leaner. Trade in non-agricultural goods is the most common secondary income source, both for respondents and their spouse(s) and other household members. Often this involves purchasing clothing, fuel, or other goods from Dedougou (the closest peri-urban center) and re-selling those goods in the village. It is also quite common for women to use food crop harvests to make *dolo* (a local alcohol made from Sorghum) or *beignets* (fried bean dough) for sale in the village. However, when agricultural yield is low, it is difficult for farmers to invest in the inputs needed to support these secondary businesses. Respondents pointed to only three income-generating options that do not require investment from agricultural income: manufacturing goods from natural products, gold mining, and migrating to Cote d'Ivoire as laborers. All three of these options are highly burdensome: it is illegal to manufacture goods out of natural (forestry) products without a permit, gold mining has very low yield and can be both dangerous and potentially illegal, and migration can disrupt family lives and create new risks. Remittances play a nearly insignificant role in respondents' financial lives: the 21% of farmers in our sample who receive remittances receive an average of only USD 159 each year.

Ultimately, though farmers' income is diversified, they rely heavily on agricultural income for their homes as well as for investing in other income streams. This pressure on agricultural income intensifies farmers' vulnerability to environmental hazard.

Risk and Significance by Crop

The benefits of many types of microinsurance are often ex-post in that purchasers receive the products' value as a result of a financial shock and subsequent insurance claim. For agricultural microinsurance, however, clients can obtain value ex-ante or even if a shock never occurs: having the insurance alone can lead to changes in behavior. For example, farmers may prefer to invest in higher risk / higher reward crops versus more prudent choices (Cole et al., 2011; Karlan et al., 2012; Kurosaki and Fafchamps, 2002). Additionally, insured farmers may choose to diversify less, knowing that the downside of concentrating risk in fewer crops is protected (Hill, 2009).





Our survey sought to understand the relative risks and rewards of different crops as perceived by the farmers themselves, in order to gain a better understanding of the types of behaviors that having insurance may have influenced ex-ante. Figure 3 plots the relative profitability, percentage of income, perceived risk and versatility of use of three main crops: maize, sesame and cotton. While cotton generates the highest percentage of income for respondents, the majority of respondents reported sesame as the most profitable crop, as sesame inputs are cheaper, and the cotton market is dominated by a single, exploitative buyer. In

addition, sesame was overwhelmingly reported as the least risky crop. **Maize fared poorly across the board, providing less household income, lower profitability and more risk than cotton or sesame.** However, maize is an important crop in that it represents a large portion of household food consumption. On average, respondents report consuming between 40% and 50% of their maize yields. Allianz' maize insurance aims primarily to improve food security by reducing the riskiness of this versatile and well-consumed crop, rather than increasing income and profitability (which would be better achieved by products covering cotton or sesame crops).

Risk Mitigation: Ex-Ante and Ex-Post

There is a distinction between measures that farmers may take to protect themselves in advance of expected droughts (ex-ante) that may or may not occur in the future and those they may take after (ex-post). We asked farmers about these distinctions and found a large variation in strategies (Table 2). Insurance is rapidly becoming a favorite among these strategies, reported by 39% of farmers (44% of those insured in 2012 and 33% of those uninsured). This likely reflects a limited number of ex-ante strategies – the result of the large dependence on climate-linked activities in the villages we visited – and a general lack of opportunities for diversification into non-farm activities. In general, ex-ante strategies are the least burdensome and are favored by respondents. More burdensome strategies are necessary after a drought, and few are sufficient to cover all of farmers' needs. Often they involve depleting assets (such as selling off animals), borrowing without having a dependable source of funds to repay loans, reducing spending, or working more.



Table 2: Risk Mitigation Strategies

Ex-Ante Strategies	Reported Utilization (% of respondents)	Ex-Post Strategies	Reported Utilization (% of respondents)
Purchase insurance	39%	Sell livestock	15%
Grow short cycle crops and / or crops that require little water or inputs	16%	Take out additional loans	14%
Lower input loan amount	10%	Diversify activities	8%
Diversify activities	8%	Reduce spending and / or consumption	5%



Insurance and the 2012 Drought

Costs of the Drought¹¹

To better understand the use of ex-post strategies and how insurance may have mitigated some of the more burdensome strategies used in response to drought, we used the Client Math methodology to calculate the costs to farmers of the 2012 drought, specifically in terms of its effects on maize crops. The two major costs of the drought were **lost income** from what would have been sold, and **money spent on food** to replace maize for consumption (see Figure 4).

Insured respondents reported losing a larger amount of maize, losing 1,800 kg of maize crop as a result of the drought, compared to 1,500 kg for the uninsured. Insured respondents reported that if there had been no drought they would have sold 50% of this crop and consumed the remainder, while uninsured respondents reported that they would have sold 63% and consumed the remainder. As Figure 4 indicates, the drought cost insured respondents an average of **USD 307**, compared to **USD 274 for the uninsured**. This difference is not statistically significant, and likely reflects the fact that insured respondents lost slightly more of their maize crops.

The costs in Figure 4 likely underestimate the strain on farmers' households following the 2012 drought, as drought affects not only maize crops, but all crop sales along with other income streams. In particular, the amount spent on food to replace maize that would have been consumed is lower than might be expected given that these households typically consume 40-50% of maize crops. This lower spending is likely due to reduced food consumption (described below) and / or consumption of other crops that otherwise would have been sold. Table 3 describes some of the additional ways in which respondents reported their agricultural and non-agricultural incomes to have been affected by the 2012 drought.

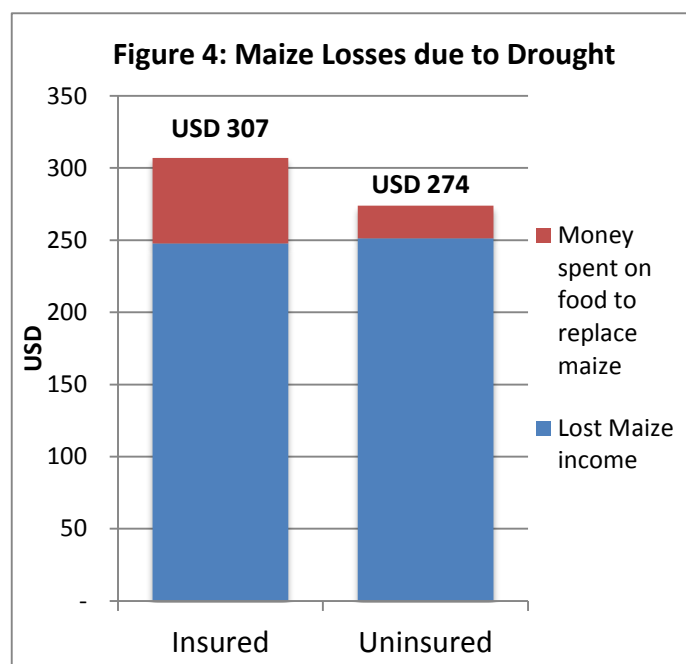


Table 3: Farmers' Reporting of Income Streams Reduced by Drought

Agricultural Income	Non-Farming Income
Inability to invest in other crops	Inability to invest in goods purchased in town to sell in the village
Inability to invest in livestock	No market for sale of goods purchased in town to resell in the village
Inability to produce and sell drinks and beverages that utilize agricultural harvests	Inability to pay for motorbike fuel, making travel into the village for work nearly impossible
Inability to get a loan the following year	Inability to purchase manufacturing materials

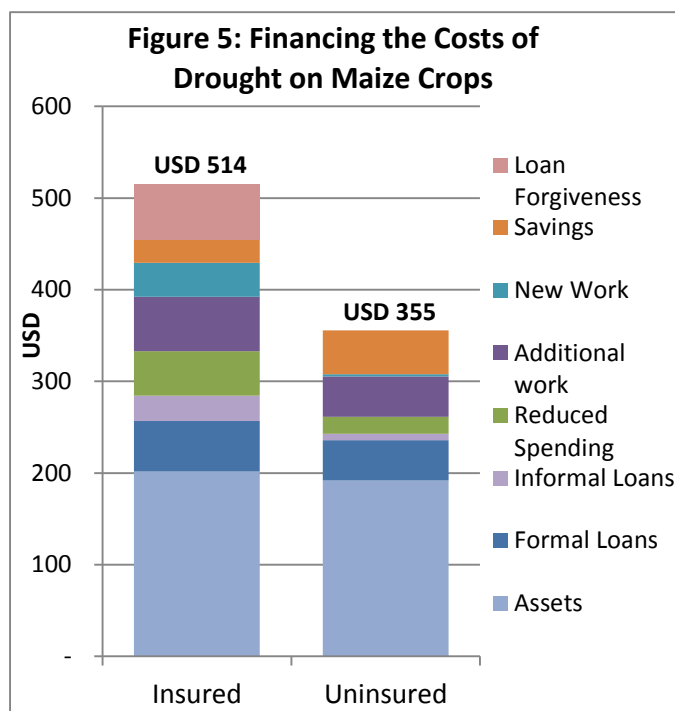
Financing Drought Costs

To understand how respondents dealt with the costs of a poor harvest we consider eight financing strategies. We asked respondents to report strategies specifically linked to the loss of maize crops; however, the co-dependence of economic activities may lead to some over-estimation of the financing needs, since other crops and household activities suffered as well. This leads to financing that, in total, exceeds the costs shown in Figure 4.

¹¹ Drought costs and financing averages exclude four outliers who skewed the averages in this small sample.



Farmers turned to formal and informal loans, asset sales, savings, reduced spending, taking on additional work, taking on new work, and Allianz' loan protection insurance (see Figure 5). Both insured and uninsured respondents utilized **asset sales** - almost exclusively livestock - to finance the majority of the shock (39% and 54%, respectively). Saving in livestock is a reliable ex-ante strategy that is often used to fill different types of income gaps and can cover significant financing needs. Asset sales can, however, be costly, especially when assets must be sold quickly at a discount (as may be likely when many households in the community sell similar assets at the same time).



Not everyone has access to sufficient assets, however. The most frequently used strategy was **reducing spending** (63% of insured and 50% of uninsured respondents utilized this strategy). In most cases respondents reported cutting food expenditures, while some reported reductions in education and health spending as well. Despite being the most frequently used financing mechanism, limiting expenditure comprised only a small portion of financing: only 9% of the insureds' total financing and 5% of the uninsureds' came from reduced spending.

The second most utilized strategy was **working more** – increasing time spent on income-generating activities that the respondent was previously engaged in as well as taking on new types of work. This accounted for 19% of the total amount that the insured financed and 13% of the amount that the uninsured financed. **Formal loans** accounted for 11% of

financing for the insured and for 12% of financing for the uninsured, while **informal loans** accounted for 5% and 2%. Last, insured respondents financed 5% of their total financed amounts with **savings**, and the uninsured financed 13% with savings. None of the respondents received gifts or remittances to finance drought costs.

Insured Financing

The insurance coverage was designed to relieve some (but not all) of the burden of the microfinance loan repayment for farmers who suffered a shock. As such, we examine the role of this coverage in the financing behavior of the insured clients and compare some of this behavior to that of the uninsured. Both groups financed more than their shock costs. This may be due to some reported financing being allocated to non-maize losses, but likely also reflects the fact that selling assets was such a widely used strategy (51% of insured and 43% of uninsured respondents utilized asset sales to finance drought costs)¹². Though selling livestock is an accessible strategy, the livestock sold were likely in some cases worth more than the respondents needed to finance the shock. In addition, respondents explained that had they been able to sell the livestock when it was 'ready to be sold,' they would have been able to make more money off of it, demonstrating that this strategy has far-reaching, burdensome effects.

The insured over-financed drought costs more than the uninsured by a margin of 37%, including the 12% of financing received from the insurance benefit. Insured respondents borrowed 39% more, reduced spending by 62% more, and used 52% more income than the uninsured, suggesting that the financial value of being insured was limited if not negative. We suggest that this is because the ex-ante benefit of insurance may have trumped the ex-post benefit. That is to say, insured respondents, having chosen insurance as their primary ex-ante mitigation strategy, may not have prepared for a bad season

¹² These figures refer to the frequency of use: the percentages of clients who utilized asset sales in financing drought costs (51% of insured respondents and 43% of uninsured respondents). Alternately, the top of page 7 discusses the percent of the total amount financed for which asset sales accounted (sales of assets account for 39% of the total amount that insured respondents financed and 54% of the total amount that uninsured respondents financed).



in the ways we discuss above, such as further diversifying crop types and timing, seeking other employment or reducing loan amounts. This behavior may be the result of the fact that the majority of insured respondents misunderstood their policy and overestimated the benefit they would receive from insurance. Indeed, 73% expected the entirety of their outstanding loan to be forgiven in the event of a drought.



In reality, debt relief was much lower than clients expected, at about 19% of loan size. This payout reflects the insurers' estimated cost of this relatively innocuous drought. The payout resulted in coverage of about 20% of costs: insured respondents had an average of USD 60 of their loan amount forgiven, while the average cost of the drought was USD 307 for insured respondents (including direct and indirect costs). As discussed above, insured clients may have changed their ex-ante risk mitigation behavior and been less prepared for a bad season than their uninsured counterparts. Ultimately, insurance coverage was insufficient to cover the reduction in other types of ex-ante preparation, and the insured had to rely on more burdensome ex-post strategies when drought struck.

A Closer Look at Selected Respondents

The data above offer some insight into the overall responses from our interviews. But averages often obscure the nuances that individual stories can offer. Our interviews tell individual stories that shed further light on the trends highlighted above.

Kalifa, Insured

Kalifa is a 45-year-old farmer. He lives in Lah, outside Dedougou in north-western Burkina Faso, where he owns 13 hectares of farmland and cultivates 9 different crops (see Table 4).

To supplement his income from crops, Kalifa raises animals, and both he and his wife sell non-agricultural goods in the weekly village market.

Four of Kalifa's 13 hectares of farmland are dedicated to maize: 50% of his maize yields are sold and the remainder is consumed. He reports that his riskiest crop is sesame, while his most profitable activity is raising large animals.

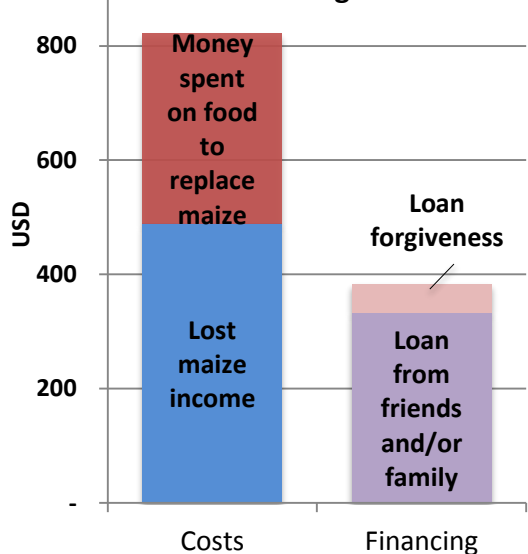
Kalifa currently has a loan with APFI, and USD 222 of this loan is insured under Allianz's agro-index insurance for maize. In 2012 he insured USD 222 with Allianz insurance as well, and after the drought that caused his maize yields to be 2000 kg less than expected, he received a USD 50 benefit in the form of loan forgiveness from the insurance. We interviewed Kalifa and learned that the drought cost him over USD 800 in lost maize income and household nourishment (Figure 6). He financed a large portion of this cost with an informal loan, but was still short of compensating for the entire loss.

The loan forgiveness from the insurance represented a small portion of the total risk. It was not fungible, and thus could not be used to purchase additional food for the household. Ultimately, though Kalifa was able to pay back his loans, he has not recovered from the 2012 season. He explains, **"When we work with loans, getting over a shock takes a long time."** Kalifa was unable to use maize income to invest in his other crops, which magnified the impact of the drought over the long-term.

Table 4: Kalifa's Socioeconomic and Demographic Information

Yearly Income	USD 3,168
Formal Savings Account	Yes
HH size	8 (3 adults, 5 children)
Crops	Maize, Beans, Rice, Fruit, Grains, Cowpeas, Cotton, Groundnuts, Sesame

Figure 6: Kalifa's Costs and Financing



When asked if insurance relieved the burden of a drought, Kalifa explained that coverage is too low. **“The insurance needs to cover everything in case of a bad season so that we don't have to sell animals or take out loans to pay back.”**

When Kalifa first purchased loan protection insurance he expected the insurance to cover the entire loan amount that he had insured. Even with the knowledge that coverage is lower than he had expected, Kalifa still prepares for a bad season by purchasing insurance and preparing to take out loans ex-post. There are few alternatives in this arid area; he recognizes that while he and his family have tried to diversify their crops and income as best they can, they are still highly exposed to weather shocks.

Lassia, Uninsured

Lassia is a 25-year-old from Lah, outside Dedougou in north-western Burkina Faso, where he lives with his mother, his wife, and 5 children. He owns and farms 30 ha of farmland (over twice what most of his neighbors own and farm), and dedicates 2 ha of this land to maize production. In addition to agricultural income, Lassia works as a craftsman when he can buy materials. His wife makes and sells *dolo* (a type of alcohol) and his mother makes and sells *soumbala* (a condiment popular in the region).

Table 5: Lassia's Socioeconomic and Demographic Information

Yearly Income	USD 4,887
Formal Savings Account	Yes
HH size	8 (3 adults 5 children)
Crops	Maize, Beans, Rice, Grains, Cowpeas, Cotton, Groundnuts, Sesame

Lassia currently holds Allianz's agro-index insurance to insure the USD 222 of his APFI agricultural input loan that he uses for maize inputs. In 2012, however, he did not purchase insurance as he felt that he did not need it.

The drought in 2012 caused Lassia and his family to lose 2000 kg of maize. Instead of coping with this loss by both selling less and consuming less, Lassia and his family consumed the portion of the maize that they would have sold. Lassia sold animals in order to replace that lost income, and explains that when he expects a bad season, his primary ex-ante risk mitigation strategy is to invest in his animals.

Implications

Low-income Burkinabe farmers have limited diversification strategies and work within relatively closed economic systems, which still rely heavily on weather patterns. A drought can devastate the area: it can affect key maize, cotton and sesame crops, reduce cash flow used to buy inputs for small businesses, and depress overall demand for the goods and services offered by farmers' non-agricultural work. There is great potential for insurance to add value for low-income farmers exactly because of this highly risky and weather-dependent economic system.

This potential is not always achieved, however, as in the case of the Allianz product.¹³ Relatively low

¹³ Though analysis of the product showed limited value for the 2012 season, it may be that a multi-year assessment would have yielded different results.



levels of loan coverage compared to a high loan amount due in one large bullet payment (because most farmers choose to make 11-month bullet payments on maize loans) reduce the potential value of the insurance by limiting its impact on loan payment relief. If insurance were offered for loans that are paid monthly, small levels of insurance coverage may make more of a difference to clients than coverage of 20% of a larger payment, as in the case of the product we analyzed. In addition, the bullet loan payments come due shortly after cotton crops are sold (Figure 2). It is likely that cotton crop revenues are used toward the payment of maize loans, which suggests a mismatch between the loan products and their use. By insuring maize crops, this product does not sufficiently address farmers' main repayment risk: a cotton crop failure (although Allianz also offers insurance covering cotton crops).

The costs of the 2012 drought were nearly identical for both the insured and uninsured farmers in this study. Insurance should have allowed the insured farmers to rely on less burdensome financing strategies after the drought. Their misunderstanding of the product actually had the *opposite* effect, as it likely changed their ex-ante risk mitigation behavior. As a result, insured farmers borrowed more, reduced consumption more, and worked more additional ex-post hours than the uninsured. This highlights the importance of offering clear and transparent information on insurance products to make sure that farmers make informed decisions in advance of poor harvests. In addition, the mismatch between the ex-ante advantages of insurance and compensation for the ex-post costs has some implications for studying the ex-ante behavioral effects of insurance. While reducing crop diversification may help boost farmers' incomes in good seasons, these incremental revenues should be measured against the costs of the unmitigated risk if insurance does not fully mitigate the risks of this reduced diversification. This is particularly important when the insurance coverage, such as in this case, does not include cash payouts.

Though Allianz and PlaNet Guarantee do offer a cash-based maize insurance product (not linked to credit) to farmers in Burkina Faso, the loan protection product is more attractive than a cash-based product to the financial institution intermediary (because it mitigates credit risk) and is therefore mandatory when most maize loans are made. Focus groups conducted with farmers during product design also found that farmers prioritize loan repayment benefits. However, our Client Math findings suggest that farmers may benefit greatly from an additional cash payout that could be used to invest in other income-generating activities and relieve the significant burden of ex-post financing strategies. This is consistent with many of our other studies that focus on debt relief coverage for weather-related shocks (primarily property coverage for floods), in which insured clients received little or no cash support and had a difficult time bouncing back from their shock (e.g. MILK Briefs [#10](#), [#15](#), [#17](#)). In most cases, credit access was preserved and in some cases, it was used actively. In other cases, however, clients were concerned about taking on new borrowing given their lesser ability to repay loans (MILK Brief [#10](#)).

Despite the findings above, farmers were not averse to the insurance. If anything, both the insured and uninsured generally had positive views of insurance, with 90% saying they would recommend this product to friends and 63% believing that the insurance offered some relief from the effects of the drought. These results are not necessarily contradictory with the "math" above. Farmers were not likely comparing their behavior with insurance to the behavior they may have exhibited without insurance, but rather analyzing the specific point in time when the drought hit them and financial needs arose. The insurance unequivocally reduced their debt obligations and thus offered some relief. Additionally, it is important to consider that farmers may not have felt like they "paid" the high cost of the product because of the way payment was structured. Those who purchased insurance were exempted by the APFI from having to set aside a savings reserve of an equivalent amount. As a result, the cash outlay was not perceived to be especially onerous vis-à-vis the uninsured, who also had to tie funds up in savings (although they had future access to the savings). Because of this unique payment scheme, it is difficult to assess whether satisfaction would have been as high if the premium were paid out of a different, more fungible pool.

Lessons for Future Products

This first initiative to apply the Client Math methodology to agricultural insurance products highlights a number of important lessons for thinking about the value of agricultural microinsurance.

Understanding the cash flows of farmers, including their major investment and loan payment cycles, can be critical to understanding which crops to cover and when. In the case of Allianz' loan protection insurance for maize crops in Burkina, linking an insurance policy to an inappropriately designed loan may have reduced its value to APFI customers.



In designing high impact products, those offering insurance should identify which crops offer farmers the most reward in terms of percentage of income and profitability and balance this with the risk of the crops. A critical flaw in this specific product appears to have been its linkage with maize loans, which seem poorly structured in relation to farmers' income streams. Linking insurance to bullet loans for cash crops, such as cotton, that are better suited to such loans may make more sense. In the area we visited in Burkina Faso, however, suppliers of farm inputs – rather than financial service providers – provided most of these loans, and this channel might be difficult to engage in offering insurance for poor farmers. Finding the appropriate delivery channel is thus critical: not only one willing to offer microinsurance, but one offering loans that are structured to be paid in line with harvests and sales, which are easier to insure.

Insurance product design should take into account existing income diversification strategies and recognize that insurance coverage may incentivize farmers to reduce these strategies, even where insurance coverage is insufficient to replace the risk mitigation that these other strategies offer. Client education and experience with the product may help to avoid this. Education is especially important when working with farmers who may make long-term decisions based on their insurance status and their perception of its coverage. In the case of Burkina Faso, at the time of our interviews, most farmers had some working knowledge of the product, in part because they had experienced it or seen other community members with it. However, they were not aware when they purchased it of the amount of coverage and may have exhibited riskier behaviors in anticipation of a significant cushion if the weather was too dry.

Cash is important. Loan relief in insurance policies offers respite by reducing the amount of money needed for outlays, but it doesn't directly put food on the table. Offering small cash benefits with insurance coverage could help farmers get their families back on their feet in the near term by maintaining their food consumption or supporting investments in other businesses.

In light of the strong dependence on weather-linked farm crops, **insurers and other stakeholders would benefit from offering technical assistance and loans to help diversify household income.** These products might be extremely valuable complements to insurance for protecting household revenues from weather risk and could include incentives for women to finance their own small business activities and build new skills and capacities for farm and non-farm technologies.



Microinsurance Learning and Knowledge (MILK) is a project of the MicroInsurance Centre that is working collaboratively to understand client value and business case in microinsurance. Barbara Magnoni leads the client value effort and Rick Koven leads the effort on the business case. Contact Michael J. McCord (mjmccord@microinsurancecentre.org), who directs the project, for more information.



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