→ In December 2010, the winter spell caused a geological fault that destroyed Gramalote. Today, more than 900 families that were forced to leave are awaiting the new construction of the town in the Miraflores district. The rebuilding project will cost approximately COP$163.000.000.000.


ADVERTENCIA
ABSTENGASE DE INGRESAR A ESTE LUGAR, MANTENGA
UNA DISTANCIA PRUDENTE DE LA ESTRUCTURA
LA ADMINISTRACIÓN MUNICIPAL DE GRAMALOTE INFORMA:

→ The sisters, Carmen, Luz Stella and Elva Marina Santander (in the photo from left to right), are leaders of the Gramalote readaptation project.

# Chapter 3
# Vulnerability to shocks and response mechanisms

Ximena Cadena*
Claudia Quintero

→ From 2010 to 2014, the life of Carmen Cecilia Santander changed: now she has María Natalia, her two year-old daughter and she is a social worker of the new Gramalote.

* We would like to thank Ana María Ibáñez for her comments.

## → 3.1. Introduction

To really understand the dynamics of poverty, it is essential to identify and understand the shocks to which families are exposed, the factors that make them vulnerable, as well as the risks they face and their recovery strategies. Understanding such factors also helps to formulate relevant public policy to prevent and mitigate the risks that households in Colombia are subject to. Shocks, as denoted by the economics literature, are events that can happen to members of a household and which have the potential —depending on their available mitigation strategies— to affect their income generation abilities or cash flows. For example, the loss of employment or illness of a member of the household may frequently require action to replace the lost income or to cover additional expenses, all of which can affect the general well-being of the household. Other shocks such as violence or natural disasters can deteriorate household assets and require investment in reconstruction and protection to avoid future damage.

In this chapter, we describe the main destabilizing events that affected Colombian households between 2010 and 2013. Based on the longitudinal data, we analyze the factors that influenced the families' vulnerability as well as their response and recovery capabilities.

Different mechanisms can be used to manage risk and respond to destabilizing events. Some involve recurring to networks and social ties in the community (relatives and friends) as a source of aid at difficult times. Others have to do with using the financial and labor markets to cushion the effects of the shocks. There are also a number of government programs, such as insurance mechanisms, which offer support to families in conditions of vulnerability. In other cases, the response possibilities are minimal and the effects on well-being are evident, even in the long term. In this chapter, we describe the main destabilizing events that affected Colombian households between 2010 and 2013. Based on the longitudinal data, we analyze the factors that influenced the families' vulnerability as well as their response and recovery capabilities. We also look at the effects of such shocks on the households' well-being and the mechanisms they used to respond to such events. Finally, we offer some policy recommendations.

## 3.2. Adverse events affecting households between 2010 and 2013

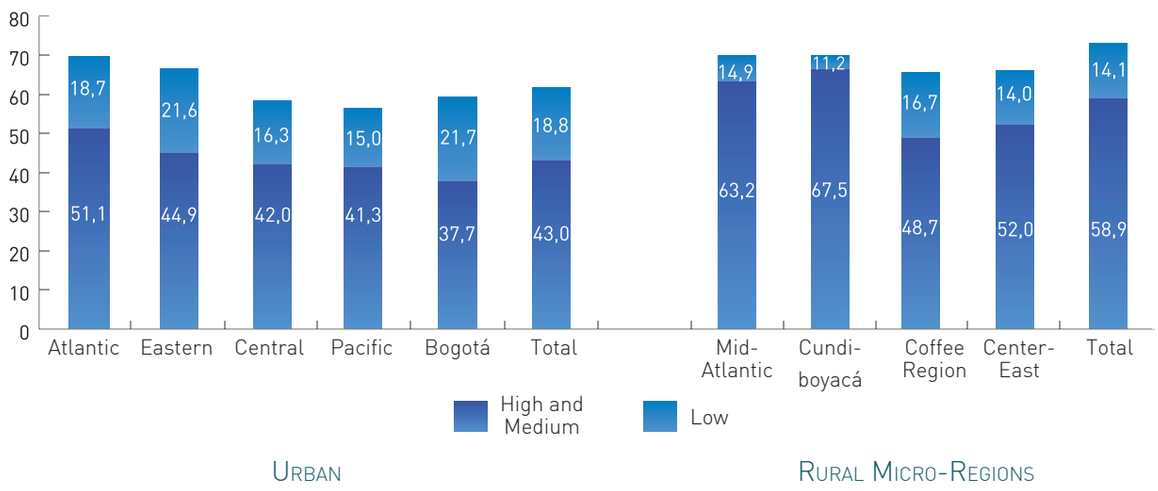
The questionnaire includes a specific chapter on household shocks that summarizes the events that the households may have been subject to during the three years between the two ELCA visits (2010 and 2013). The questions help reveal the economic impact of these events and the measures taken by the households to overcome them. This module captures information regarding a list of fifteen adverse events for all households over the three years. Given the agricultural and livestock activities the households are engaged in, two additional questions —related to the loss of crops or animals— are included for the rural area. In this analysis, a classification system is used to characterize the shocks experienced by the Colombian households between 2010 and 2013. The Appendix to this chapter presents an in-depth description of each event, its impact and the category to which it is assigned. In total, 61.7% of the urban households and 73.0% of the rural households reported having experienced at least one destabilizing event in the household over the three years. In particular, 42.9% and 58.9% of the urban and rural households (respectively) considered that at least one of the events they suffered ranked as having a high or medium impact on the economic stability of the household.[1]

Figure 3.1 shows the percentage of households that reported regional level shocks for the ELCA urban and rural samples (four micro-regions). The darker bars represent shocks with a medium to high impact on the households' economic stability and the lighter bars indicate shocks with a lesser impact. There are notable differences by regions and by levels of wealth. The Atlantic region in the urban sample and the mid-Atlantic and Cundiboyacá regions in the rural area appear to present greater impacts of shocks.

1. We will henceforth refer to considerably important shocks as those events that the household classifies as having had a medium to high impact (not low) on the economic stability of the household.

## Figure 3.1.

Households that experienced shocks over the three years and economic impact by region (percentage of households).




*Source:* Authors' calculations based on ELCA 2010 and 2013

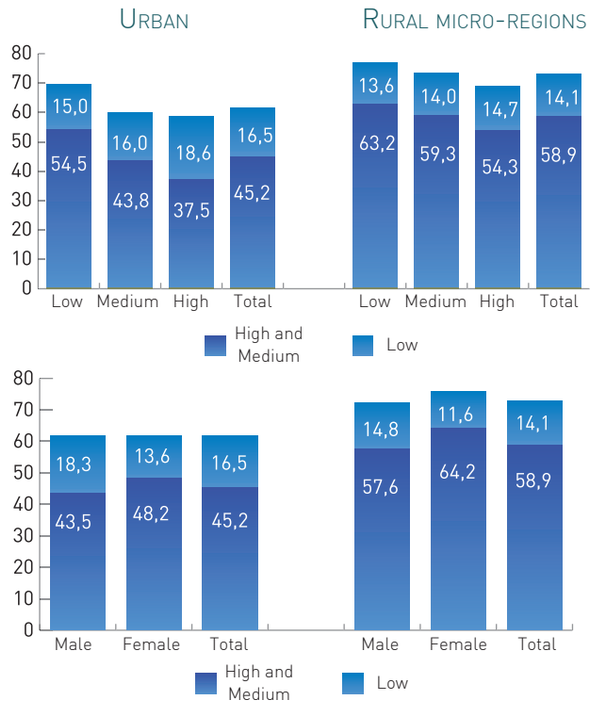
Households that experienced at least one destabilizing event over the three years. The dark bar shows the households that experienced a shock with a medium to high economic impact. The clear bar shows those which experienced a shock with low economic impact. The rural sample is only representative of the mid-Atlantic, Cundiboyacá, Coffee Region and Center-East micro-regions.

→ Chinú, Córdoba. The hardest trial in the life of Ms. Inés María Álvarez was the death of her only son, four years ago. She has seven daughters.

Figure 3.2 shows the occurrence of shocks by levels of wealth and gender of the household head. In both areas, there are significant differences in the occurrence of shocks (cumulative total for dark and light bars) and shocks with a considerable impact (dark bars), between the high and low levels, according to the wealth index. These differences are more noticeable in the urban area. In terms of the gender of the household head, this does not appear to significantly affect the probability of experiencing shocks in the urban area, whereas the households with female heads in the rural area report a greater incidence of high impact shocks (dark bar).

## Figure 3.2.

Households which experienced shocks over the three years and economic impact by level of wealth and gender of the household head (percentage of households).



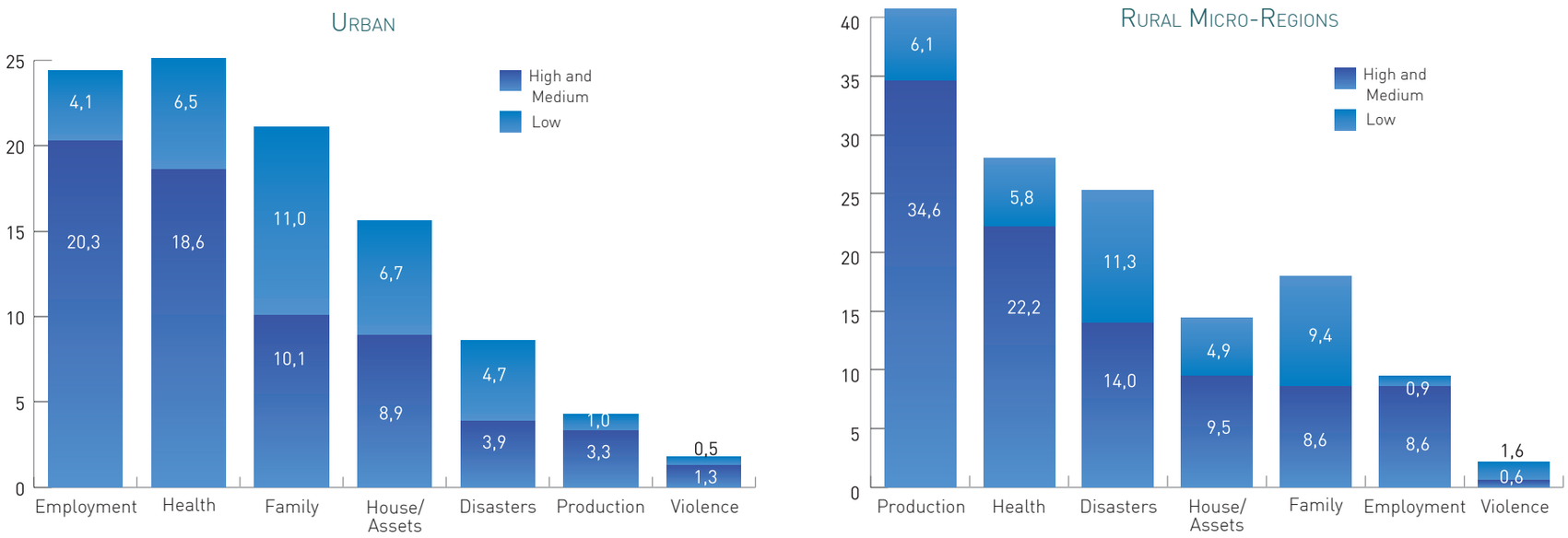

*Source:* Authors' calculations based on ELCA 2010 and 2013

Households that experienced at least one destabilizing event over the three years. The dark bar shows the households that experienced a shock with a medium to high economic impact. The clear bar shows those which experienced a shock with low economic impact. The level of wealth corresponds to the third part of a continuous wealth index, based on durable assets and the households' access to public services. The rural sample is only representative of the mid-Atlantic, Cundiboyacá, Coffee Region and Center-East micro-regions.

A household can be affected by different types of shock. The most common and significant in both urban and rural areas are those events that affect the household's ability to generate income. In the urban area, this includes loss of employment by the household head or spouse or any other member of the household (24.4 in total and 20.3% with considerable impact). In the rural area, these are associated with livestock and production shocks and include plagues or loss of crops or livestock, and bankruptcy of the family businesses (40.1% in total and 34.6% with considerable impact). In second place are health shocks. These occur when a member of the household has an accident or suffers an illness which impedes her/him from carrying out her/his daily activities. This may bring economic implications for the household when the person stops working or receiving important income for the sustainability of the household. Or, in the case that a child in the household falls ill, some adult in the household will have to dedicate time to taking care of the sick child. Additionally, the expenses associated with medical attention and medicine may require additional funds or cut-backs on other expenses. The other types of shock differ in relative importance in the urban and rural areas. While natural disasters (floods, avalanches, landslides, overflows, gale winds, tremors and earthquakes) affected a large proportion of the rural households (25.3% total and 14.0% with a medium to high impact in the rural area, and 8.5% and 3.9% in the urban area respectively); family shocks (death, separation or the arrival of new members of the household) or house and asset shocks (change of residence or loss of assets) were more common in the urban area. Figure 3.3 shows the percentage of households that reported at least one shock of each type and the corresponding level of impact in the rural and urban areas.

## Figure 3.3.

Households which experienced shocks over the three years and economic impact by type of event (percentage of households).




*Source:* Authors' calculations based on ELCA 2010 and 2013

Households that experienced at least one destabilizing event over the three years. The dark bar shows the households that experienced a shock with a medium to high economic impact. The clear bar shows those which experienced a shock with low economic impact. The events were classified into the categories shown in the figure. For more details on the content, see Appendix 1. The rural sample is only representative of the mid-Atlantic, Cundiboyacá, Coffee Region and Center-East micro-regions.

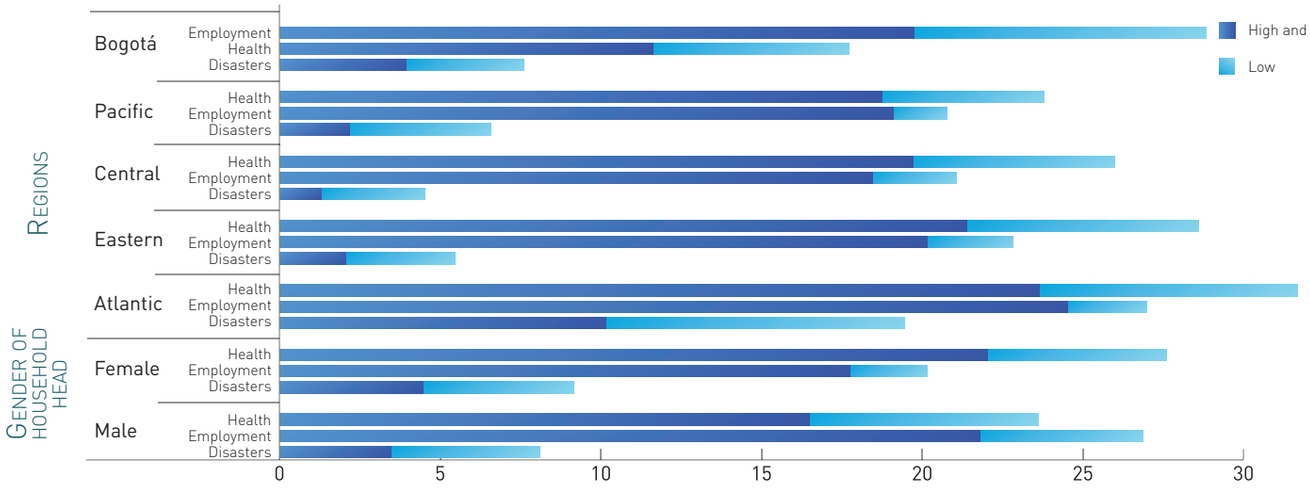
A number of regional and socioeconomic characteristics can influence the households' level of vulnerability when faced with certain types of events. For households in Bogotá, for example, employment shocks are particularly important. They occur with greater frequency and affect the economic stability of the household more significantly than any other type of shock. In other urban regions, in contrast, health shocks seem to be as prevalent and important as employment shocks. Also, in the Eastern and Central Regions, a greater proportion of households report health shocks, with medium to high economic impacts, than they do employment shocks with the same intensity. The Atlantic region presents the greatest percentage of households reporting employment, health, and disaster shocks for any level of intensity (see Figure 3.4).

Figure 3.4 details the percentage of households that experienced employment, health, and disaster shocks in the urban area in accordance with the gender of the household head. The households with female heads reported a greater proportion of health shocks (27.6% total and 22.0% with considerable impact), whereas households with male heads report having experienced more employment shocks. Natural disasters do not appear to have affected households with male or female heads in a distinctive manner.

Although the ELCA rural sample households showed no evidence of significant differences in the incidence of shocks by level of wealth or by the gender of the household head, there are, nevertheless, regional contrasts. The greatest proportion of production shocks occurred in the Cundiboyacá Region (50.5% total and 44.7% with considerable impact), followed by the mid-Atlantic and Center-East regions (nearly 35% with medium-high impact). Households in the Coffee Region reported production shocks in a significantly lower proportion; in fact, the region was most affected by health shocks than production shocks (see Figure 3.5).

## Figure 3.4.

Urban households that experienced shocks over the three years by type of event, region and gender of household head (percentage of households).

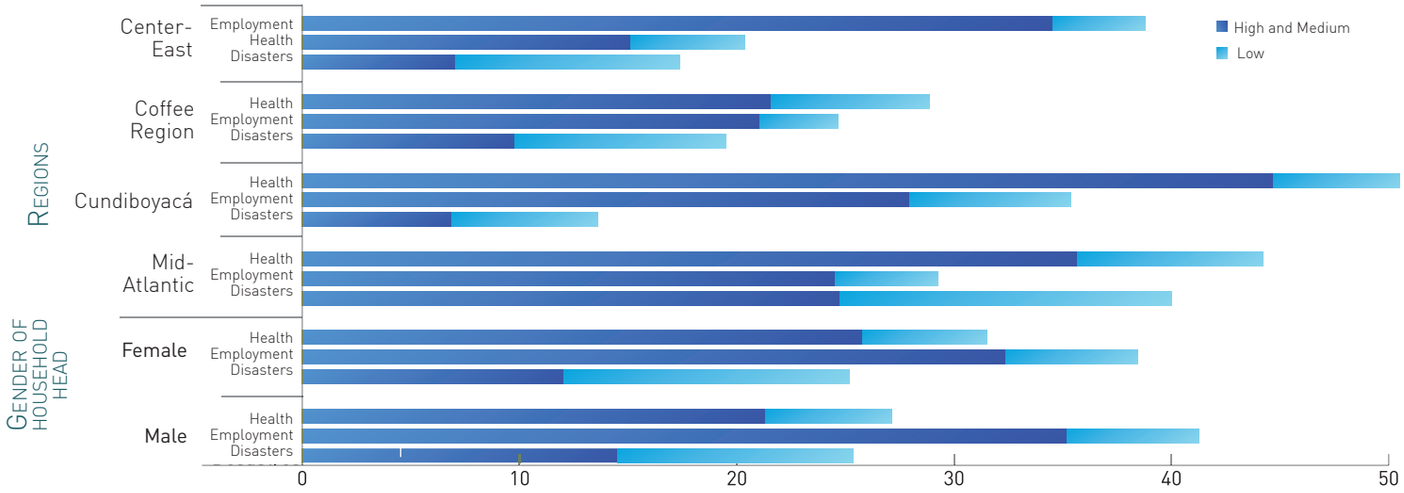



Households that experienced at least one destabilizing event over the three years. The dark bar shows the households that experienced a shock with a medium to high economic impact. The clear bar shows those which experienced a shock with low economic impact. The events were classified into the categories shown in the figure. For more details on the content, see Appendix 1.

*Source:* Authors' calculations based on ELCA 2010 and 2013

**Figure 3.5.**

Rural households that experienced shocks over the three years by type of event, region and gender of household head (percentage of households).




Households that experienced at least one destabilizing event over the three years. The dark bar shows the households that experienced a shock with a medium to high economic impact. The clear bar shows those which experienced a shock with low economic impact. The events were classified into the categories shown in the figure. For more details on the content, see Appendix 1. The rural sample is only representative for the mid-Atlantic, Cundiboyacá, Coffee Region and Center-East micro-regions.

*Source:* Authors' calculations based on ELCA 2010 and 2013

## 3.2.1. Natural disasters

During the second semester of 2010, a short time after completing the data collection for the first wave of ELCA, Colombia experienced a period of high rainfall known worldwide as the phenomenon of La Niña. These rains caused floods, rivers overflowing and other natural disasters in different parts of the country. For example, Gramalote, a town located in Norte de Santander —included in the ELCA urban sample— was destroyed by an avalanche which caused a landslide near Cerro de la Cruz. The impact of the disaster was such that Colombia was declared by German Watch as the third most significantly affected country in the world by weather-related disasters (Harmeling, 2012). In 2011, the winter spell caused new damage and droughts.

To understand the dimensions of these extreme climatic events and the natural disasters they caused, questions were included in the ELCA questionnaire in order to investigate the degree to which they affected households, their dwellings and communities. The questions also inquired about the governmental aid programs and other sources of support that were used during the emergencies.

The main natural disasters that affected the ELCA households over the three years were floods, affecting rural and urban households to the same degree (10%) and gale winds (14%), particularly in the rural areas. These disasters occurred with greater intensity in the urban areas of the Atlantic Region where 21.3% of households reported having experienced floods and 6.8% reported damage as a consequence of gale winds. In the rural area, the mid-Atlantic region was also characterized by high impact levels, and strong winds were also frequent in the Coffee and the Center-East regions.

In many cases, these natural disasters caused total (5.5% urban and 6.6% rural) or partial (53.4% urban and 66.3% rural) destruction of the homes, which then required improvement or repair. In fact, natural disasters forced nearly 15% of those affected in both areas to move. Fourteen percent of the urban and rural households that experienced some kind of disaster reported that the water source or service was partially or totally destroyed. In particular, Bogotá stands out due to the destruction of its water and sewage systems and for requiring home reparation assistance.

→ Cereté (Córdoba). José Miguel Petro has COPD (Lung Disease), which has made him slow down. He used to breed fighting roosters.

According to reports filed by the households, the government and other entities' response to the emergency was weak. Even though *Colombia Humanitaria's* management reports show investments of nearly COP$5.3 billion, with a high component of social accompaniment through the provision of food, other goods and shelter solutions, according to the information gathered by ELCA, only 10.3% of the households affected by natural disasters in the urban area and 5.3% in the rural area reported having received aid from natural disaster programs in 2012 (see Table 3.1). In the urban area, the support was mostly concentrated in Bogotá (34.9% of those affected received some type of aid from the government) where people were provided with health brigades, tax aid, money (cash), groceries, clothes and household articles. Despite having been strongly affected, the aid reported as having been provided by the government and organizations in the rural area was much less. The most outstanding programs included the health brigades. However, some households benefitted from Red Unidos and, particularly in the Coffee Region, people benefitted from credit waivers. Groceries and goods for the household were provided mostly in the mid-Atlantic region, while home repair assistance was more concentrated in the Coffee Region.

**Table 3.1.**
Households that benefitted from natural disaster aid programs (percentage of affected households).

| Urban | | Rural Micro-Regions | |
|---|---|---|---|
| Atlantic | 5,74 | Mid-Atlantic | 5,19 |
| Eastern | 1,81 | Cundiboyacá | 3,91 |
| Central | 0 | Coffee Region | 10,13 |
| Pacific | 0 | Center-East | 3,56 |
| Bogotá | 34,95 | | |
| Total | 10,31 | Total | 5,36 |

*Source:* Authors' calculations based on ELCA 2010 and 2013

Households that received or benefitted from some natural disaster assistance program or aid during 2012. This is calculated over the total number of affected households. The rural sample is only representative of the mid-Atlantic, Cundiboyacá, Coffee Region and Center-East micro-regions.

## 3.3. Vulnerability to shocks

The shocks that a household suffers can be reflected in its subsequent socio-economic conditions. For example, the follow-up survey after the event can show that family shocks can generate a recomposition of the household in terms of number of members and heads. Similarly, a household's prior conditions can determine the probability of the event occurring and, more concretely, the level of economic impact that the shock may cause. In this section, the longitudinal information collected through ELCA is used to study the vulnerability of the households. To do this, the conditions reported in 2010 (before the shock) are used to study how they affect the probability of experiencing shocks of considerable impact between the two waves of the study.

→ With the milk from her two cows, Lucrecia Martínez (Puente Nacional) makes a curd cheese that she sells for 7 thousand pesos. This is her only fixed income.

The households' capacity to prepare for shocks can affect the possibility of them occurring and, in case they do, determine their economic impact, the response mechanisms, and recovery capacity. Lack of preparedness when faced with risk can begin a vicious cycle, which results in greater future vulnerability and less resilience. In fact, the households that, in ELCA 2010, reported having suffered adverse effects over the previous twelve months were more likely to report shocks occurring between the two ELCA waves with medium or high impacts on the economic stability of the household in ELCA 2013. Figure 3.6 presents the percentage of households that reported medium to high level shocks in 2013 by type of event. The red bars indicate the proportion of households that also reported shocks in 2010 and the blue indicate those that had not reported adverse events in the last twelve months in 2010.[2] While 39.5% (52.8%) of the urban (rural) households that did not report shocks in 2010, suffered at least one adverse event in 2013, 54.6% (63.1%) of those that reported shocks in 2010, reported them again for the period between ELCA 2010 and ELCA 2013. In the urban areas, the differences between both groups are statistically significant for all types of shock except violence, and in the rural area, for the most important: production and health.

## Figure 3.6.

Vulnerability to shocks with medium to high economic impact over time and by area (percentage of households).


*Source:* Authors' calculations based on ELCA 2010 and 2013

Households that experienced shocks with medium to high economic impact over the three years. The events were classified into the categories shown in the figure. More details on these can be found in Appendix 1. The rural sample is only representative of the mid-Atlantic, Cundiboyacá, Coffee Region and Center-East micro-regions. A 95% confidence interval is reported.

2. The baseline questionnaire for 2010 asked about the shocks for the reference period of twelve months. While in 2013, the period of reference was of three years to cover the time span between the two waves.

In 2014, the World Bank, in its World Development Report (WDR, 2014) presented a disaster preparedness index that groups indicators into four categories: human capital, physical and financial assets, social support and State support. Foa (2013) calculates and presents the index for 140 countries. He argues that human capital offers knowledge, skills, and health which allows the flexibility to prepare for and manage risks when they occur; physical and financial assets —savings and credits— can absorb the effects of shocks; State and social support also allow the households to rely on mechanisms of formal and informal support through health insurance, pensions, access to programs and infrastructure or, simply, on the aid that friends and relatives can provide in challenging times.

This reference framework is useful for studying the vulnerability and response capacity of the households when dealing with adverse events. Figure 3.7 presents the percentage of urban households that reported suffering shocks of medium to high impact in 2013, in accordance with their characteristics in 2010. The characteristics associated with human capital include the education level of the household head or spouse (having finished secondary education or having achieved a degree in higher education, be it technical, technological or university), and preventative health measures of the household members (preventative health visits). The probability of those households with higher levels of human capital in 2010 —education and health prevention— suffering shocks was over five percentage points below those that did not complete secondary education or present risky health behaviors.

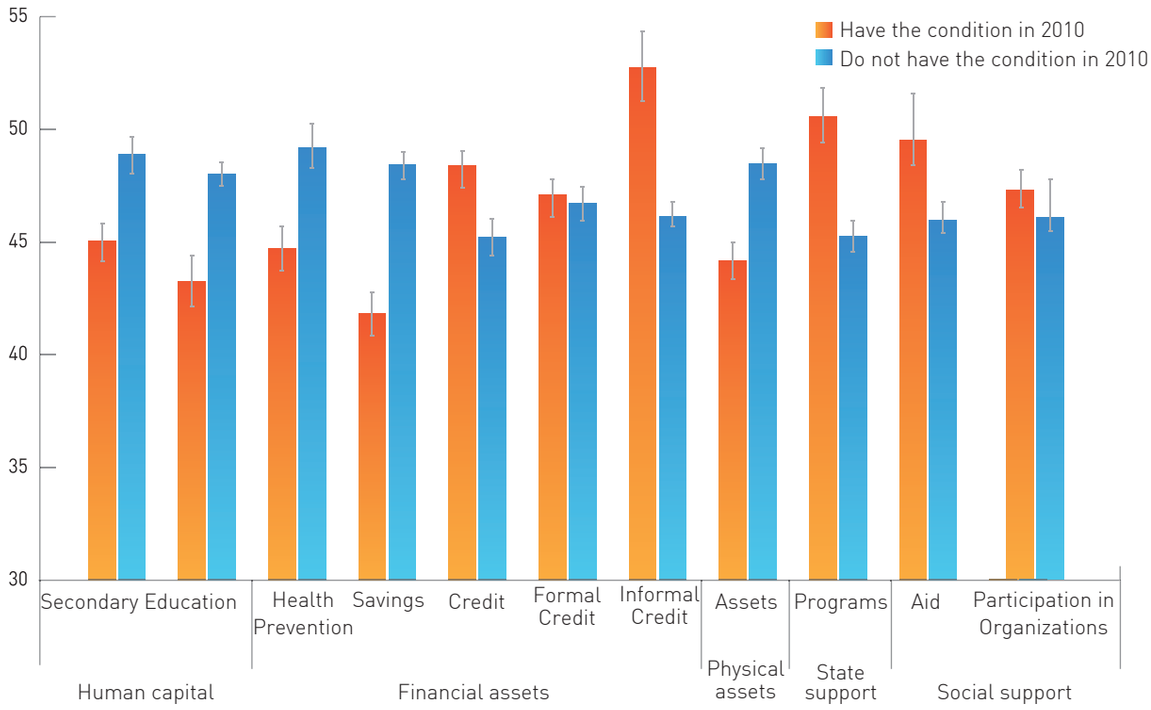
→ The big fruit and vegetables supermarkets lowered local sales in Corabastos and Facatativá for the García Segura family from Bogotá.

There are five indicators of financial and physical assets ownership. The financial assets can be divided into savings and access to credit, which may be formal or informal. The households that saved money in 2010 reported fewer occurrences of shocks between 2010 and 2013 than those that did not (41.8% and 48.4% respectively). Access to informal credit seems to be related with greater vulnerability. Physical assets include motorcycles, cars, houses, lots or machinery and other assets for rent such as rooms, warehouses, garages, etc. and, as with savings, these are associated with a lesser probability of experiencing events which considerably destabilize the household.

State support in the case of households can be identified by their access to governmental programs (Familias en Acción, Training Programs in SENA, ICBF Programs, Red Unidos, aid for displaced people and for natural disasters, among others). This and the aid indicator (receiving aid in money or in kind and contributions from family, friends or institutions) seem to be related with greater levels of vulnerability. Finally, participation in social organizations (head or spouse participates in some social or community organization) as an alternative indicator of social support does not significantly influence the probability of experiencing shocks with considerable economic impact. It is possible that the indicators of social and State support identify households that are particularly poor and vulnerable, which due to their situation receive support from the State, relatives, friends and other organizations, and they experience the effects of shocks more strongly.

## Figure 3.7.

Probability of experiencing shocks with medium to high economic impact in accordance with previous characteristics in the urban area (percentage of households).




*Source:* Authors' calculations based on ELCA 2010 and 2013

Households that experienced shocks with medium to high economic impact over the three years. The information on the characteristics is from 2010. The level of education relates to the household head. The physical assets include motorcycles, cars, houses, lots or machinery and other assets for rent such as rooms, warehouses, garages, etc. Receiving State support is defined as being beneficiaries of some governmental program, and participation in organizations refers to the household head or the spouse participating in some social or community organization. A 95% confidence interval is reported.

The economic effects of the shocks can be determined by their impact, but also by the households' mitigation and recovery strategies.

→ The Palacios Campo household in Barrancabermeja are facing a time of great need. Two of the household members, women heads of household, have a job cleaning pipes.

The index components affect the probability of experiencing distinct types of shock in a differential manner. Health shocks with high impacts on the households' economic stability are more frequent when levels of human capital and physical assets are lower and in those households that received social and State support in 2010. Intense employment shocks affect households which have physical assets and no governmental aid to a lesser extent (around 20% compared with 24% of those that did not have physical assets or State programs in 2010). Human capital and financial assets help reduce the probability of natural disasters, considerably affecting the economic stability of the household.

## 3.4. Risk-management mechanisms in the households

The economic effects of the shocks can be determined by their impact, but also by the households' mitigation and recovery strategies. Therefore, a household which can resort to its savings or other assets, when an unexpected event reduces its income or increases expenses, is able to deal with the shock and recover much more easily than one that has to engage in actions which directly affect its short, medium and long term well-being such as moving home, reducing food expenses or taking the children out of school.

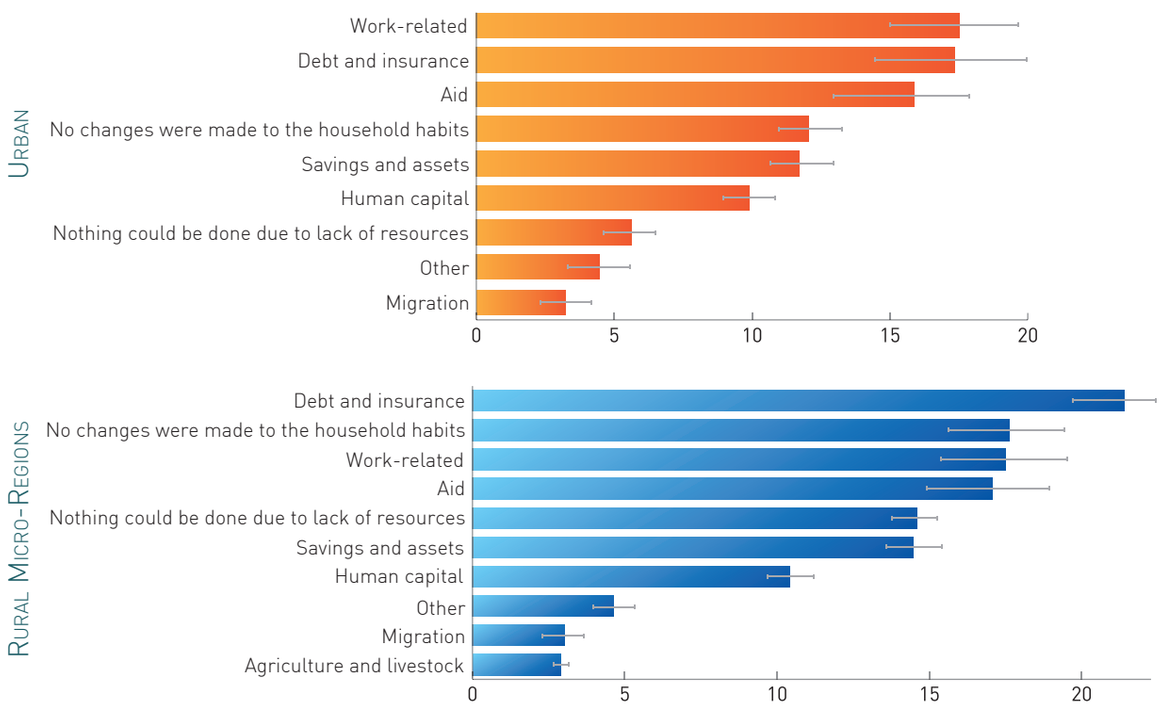
In ELCA 2013, those households that reported medium or high economic impact shocks were asked what the members of the household did to deal with or overcome the problem. The responses are classified into twenty and twenty-two options respectively for urban and rural households grouped into seven categories as shown in Appendix 1.

Figure 3.8 presents the percentage of households that with at least one shock of considerable economic impact used some kind of response mechanism. In the urban area, the most common responses had to do with employment, whereby the members of the household who did not work sought employment and those that already worked increased their working hours (17.5% of the households that suffered some kind of strong shock reported this type of response). Very close to this percentage are households that resorted to going into debt or using insurance (17.4%) or seeking aid from family, friends or institutions (15.9%). In the rural area, the most frequent response is the use of credit —particularly with families or friends— and insurance (21.4%). The responses related to work or aid also stand out (17.5% and 17.1% of the households that experienced shocks, respectively).

Even though they are not the most frequent, it is worth noting other responses reported by the households when faced with shocks. The proportion of households which reported not taking any action to deal with an event with a considerable economic impact is high: 12.1% of urban households and 17.6% of rural ones reported not having to change household habits and 5.6% and 14.6% reported not being able to do anything when faced with the event due to lack of resources or alternatives. It is also significant to note the use of household assets to deal with the effects of these events (11.7% and 14.5% of the urban and rural households, respectively). This includes spending savings or selling or mortgaging some asset, which

## Figure 3.8.

Household responses to dealing with shocks by area (percentage of households).

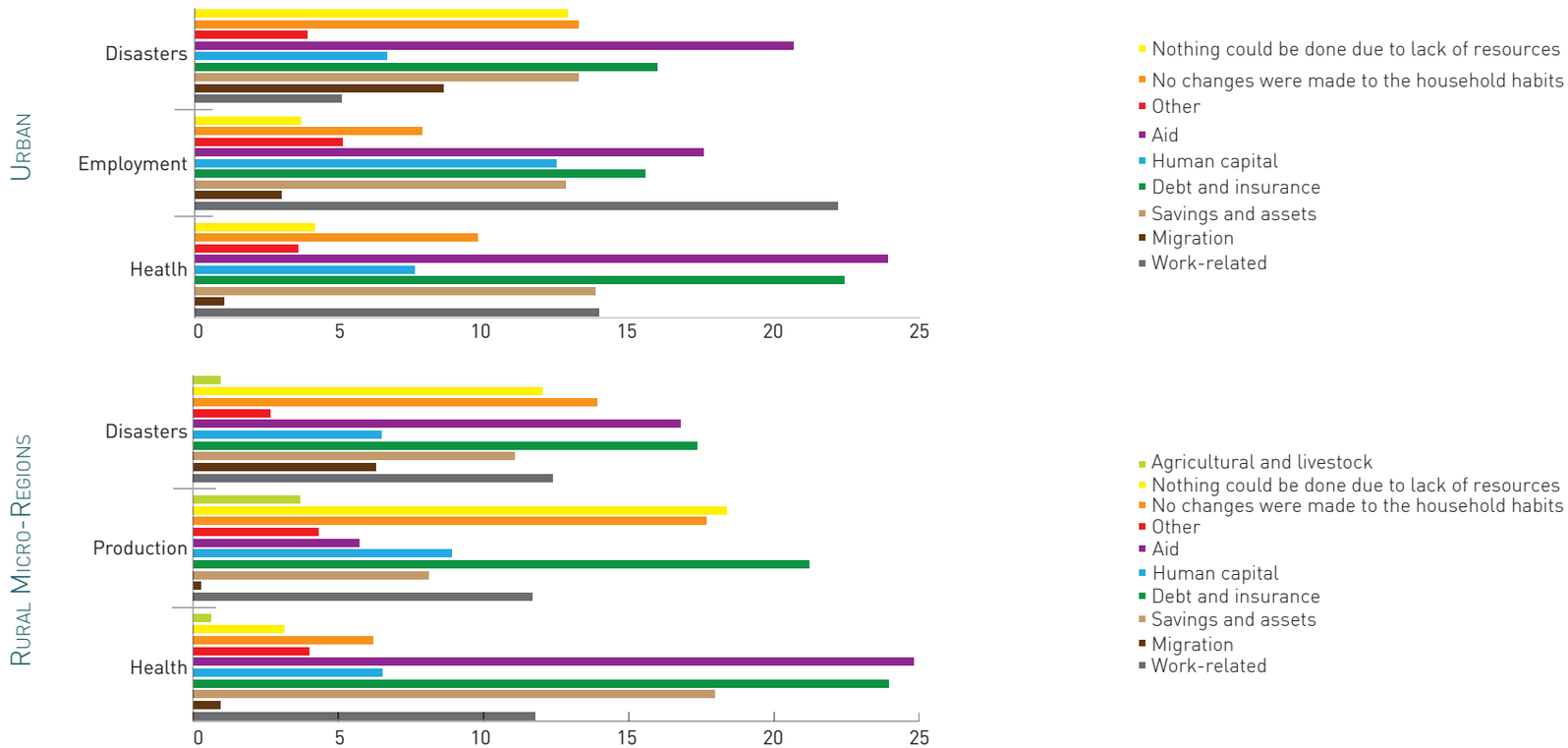



*Source:* Authors' calculations based on ELCA 2010 and 2013

Household responses in dealing with shock are for those that experienced a shock with medium to high economic impact over the three years. The events were classified into the categories shown in the figure. More details on these can be found in Appendix 1. The rural sample is only representative of the mid-Atlantic, Cundiboyacá, Coffee Region and Center-East micro-regions. A 95% confidence interval was reported.

## Figure 3.9.

Households' responses by type of event and area (percentage of responses).




*Source:* Authors' calculations based on ELCA 2010 and 2013

Households' responses in dealing with shock are for those that experienced a shock with medium to high economic impact over the three years. The responses and types of events were classified into the categories shown in the figure. More details on these can be found in Appendix 1. The rural sample is only representative of the mid-Atlantic, Cundiboyacá, Coffee Region and Center-East micro-regions.

can be attractive alternatives to temporarily accommodate the needs of the household. However, this can turn out to be costly in the mid-term in cases whereby the loss of capital due to the loss of the household's production assets leads to a poverty trap which is very difficult to escape (Carter, Little, Mogues, and Negatu, 2007).

The use of human capital-related strategies is very costly in the mid- to long-term. When faced with shock, nearly 9.9% of the households in both areas attempted to reduce food consumption and educational expenses or they took the children out of school altogether. Finally, 3.2% of the households in the urban and rural areas were forced to move

house (within or outside the town or country) when faced with a shock and this same proportion of rural households resorted to agricultural or livestock-related strategies such as increasing the use of fungicides or killing livestock to deal with production shocks.

Even though some strategies appear to be more popular than others, in times of crisis, it is generally possible to identify trends by which some response mechanisms are more appropriate for dealing with certain types of shock. Figure 3.9 outlines the distribution of responses by type of shock, which, in turn, reveals hidden details in the added data. The migration-related strategies are particularly important when violent events or natural disasters occur causing forced displacement and the use of savings and assets. For health shocks, asking for aid and using savings and assets are important strategies. In the urban area, work-related strategies seem to be closely linked with employment shocks; whereas, in the rural area, production shocks frequently do not cause responses in the household because of the lack of resources or possibilities or because they do not require changes in the household habits. The response strategy used by a household when facing or overcoming adverse events will depend on its conditions and possibilities. The description presented up to now shows that, in many cases, these strategies cannot be referred to as "optimal" due to the costs that they incur and the fact that they tend to be needs rather than choices.

For example, the strategies related with asking family and relatives or institutions for aid are especially implemented by the poorest households and those with female household heads in the urban areas. Clearly, regional customs also play a role in terms of asking for aid in the community in times of crisis. In the urban area, the Atlantic region stands out for having high levels of aid (28.2% of households report this as their response strategy), while in Bogotá, asking for aid is significantly less frequent (6.5%). The rural households in the mid-Atlantic region resort more to asking for aid (21.6%), followed by the households in the Coffee and the Cundiboyacá regions and, finally, the Center-East region, where only 11.9% of the households ask the community for aid when adverse events occur. This same regional pattern in the rural area exists insofar as migration, whereby the mid-Atlantic and Coffee Region are much more affected by migration (5%) than the Cundiboyacá and Center-East regions (1%).

In the same way as with vulnerability, a household's response strategies are determined by its conditions prior to the event. In particular, the components of the disaster preparedness index (WDR, 2014) identify characteristics that can provide households with alternative responses that are less costly and allow for better recovery after the shock. The households with the highest levels of human capital in 2010 resorted more to their own assets and fewer labor market-related strategies. Those households that saved or had formal credits in 2010 (financial assets) are more likely to end up going into debt and spending their savings or cashing out other assets, and less likely to ask others for aid. In contrast, the households which, in 2010, were already receiving aid from State programs or transfers from other sources resorted more to asking for aid and working, and were less likely to use their own assets probably because they were already de-capitalized.

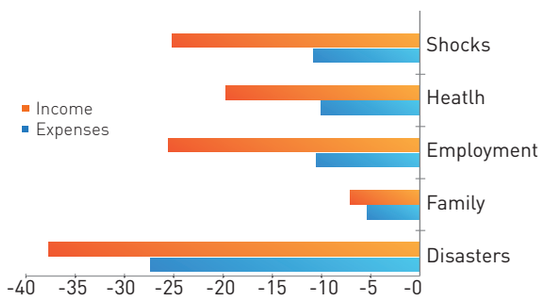
→ At 68 years of age, Luis Eduardo Palacios works as a doorman in Barranca. It is a temporary job; he has no social security and works 12-hour shifts.

## 3.5. Effects on well-being and some recommendations

The dynamics described up to this point indicate that Colombian households differ in their levels of vulnerability to different shocks and in their possible response options to overcome them. Between 2010 and 2013, a great proportion of families experienced events that caused economic instability. In this section, we will present a number of estimations of the effect of the shocks; the role played by the previous conditions that may have allowed for a certain level of preparedness; and the households' strategies in terms of individual income and expenses, once the events occur.[3]

On the one hand, we seek to explore the effects of the shock on the households' ability to generate income. The loss of employment, incapacity at work due to a health problem, the loss of a member of the household, or of productive assets, etc., can affect a household's income for periods of time, especially when the conditions for disaster preparedness are deficient (for example, lack of social security, savings or insurance, etc.). The expenses analysis takes into account that in the presence of shock, the households' particular conditions lead them to resort to strategies that can smooth consumption and lessen the impact of the shocks. In fact, Figure 3.10 shows that for the urban area, the effect of shocks on individual income is always greater than it is on individual expenditure.

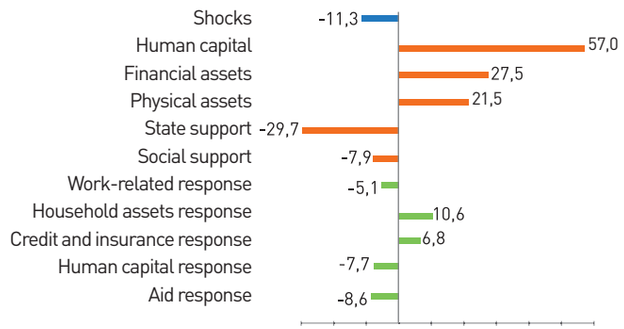
**Figure 3.10.**
The effects of shocks on changes in household income and expenses per person in the urban area (percentage).




*Source:* Authors' calculations based on ELCA 2010 and 2013

The estimations were made using the 2010-2013 data panel and the difference in differences method, which allows for comparing the changes in the variables of interest (income and expenses per person) with regards to the changes in the conditions of the household between the two periods (shocks). The effects of the shocks are shown in the percentages over the basic level of income and expenses. The events were classified into the categories shown in the figure. For more detail on its content, see Appendix 1.

**Figure 3.11.**
The effects of shocks on changes in individual expenses, characteristics and responses in the urban area (percentage).




*Fource:* Authors' calculations based on ELCA 2010 and 2013

The orange bars present the effect of household conditions on individual expenses before the shock (in 2010). The green bars show the effects of each type of response on individual consumption. The estimations were made using the 2010-2013 panel data and difference in differences method, which allows for comparing the changes in the variables of interest (income and expenses per person) with regards to the changes in the conditions of the household between the two periods (shocks). The events were classified into the categories shown in the figure. For more detail on its content, see Appendix 1.

Natural disasters had the greatest effect on household well-being by negatively affecting the income and expenses per capita by 37.7% and 27.4% respectively. Employment and health-related shocks affected the income by 25.6% and 19.7% respectively, but are reflected by an almost 10% reduction of expenses per person. Family shocks, despite having a significant statistical effect on well-being, were lower in magnitude (around 6%).

3. The estimations were made using the 2010-2013 panel data and using the method of difference in differences, which allows for comparing the changes in the variables of interest (income and expenses per person) with regards to the changes in the conditions of the household between the two periods (shocks). The effects of the shocks are shown in the percentages over the basic level of income and expenses. In this chapter, only results on the urban level are presented. In chapter 8, Ibáñez et al. (2014) undertake an analysis for the rural area including other relevant aspects related with access to land and livestock production for these households.

Finally, Figure 3.11 outlines the effects of the conditions before shocks (which are summarized using the disaster preparedness index components) and of the possible response mechanisms used by the households when dealing with limitations on their levels of consumption.[4] The average impact of high impact shocks is a reduction of 11.3% in per capita consumption. The orange bars present the effect of household conditions on individual expenses before the shock occurred (in the 2010 baseline survey). Human capital, financial assets, and physical assets offer conditions that can cushion the negative effects of the shock on consumption. The households that have received governmental and community aid since 2010 are in conditions of dependency, which negatively affect their level of consumption when a destabilizing event occurs. In the same figure, the green bars show the effects of each type of response on individual consumption. The responses related with household assets (spend savings or sell off assets), access to credit, or insurance help to cushion the effects of shocks by countering the negative effects on consumption. In contrast, other response mechanisms such as working more or asking for aid, turn out to be more costly in terms of well-being. In particular, the human capital-related responses had a negative impact on human capital, which deepened the effects of shocks between 2010 and 2013. Also, given that they have long-term effects on the accumulation of human capital and the ability to generate more income, these could perpetuate the effects of the shock over time.

In conclusion, identifying the mechanisms used by the households is essential for public policy design and implementation. The policies aimed at reducing vulnerability and exposure to risk and poverty must take into account the effects of the shocks and the back-up strategies available. The Colombian households are exposed to adverse effects that can affect them economically. The level of vulnerability and the effects on well-being are minor for those with greater levels of human capital and with access to physical and financial assets. Some policies focused on strengthening human capital (education and health) and access to formal financial services (products that favor savings and access to credit and insurance) could, in addition to being desirable as they are, have important repercussions on the households' level of vulnerability and their risk management capabilities. The results show that the conditions of the household prior to the shock constitute the risk management tools, which determine the effects of shock on well-being. At the same time, they condition the strategies or response mechanisms available to the household in times of crisis. The capacity to accumulate physical and financial assets can cushion the effects of shocks on consumption. Therefore, public policies that deal with disaster management and mitigation must recognize the differences in the vulnerability and resilience capacity of the households. For one thing, the disaster management instruments available for the households must be strengthened with improved levels of human capital and access to assets. This must be undertaken through the design and implementation of relevant financial products that favor the acquisition of assets, access to credit and to the insurance market. Furthermore, programs must be developed which focus on supporting prevention among the most vulnerable and offer mechanisms that help cushion the effects of the shock —relaxing budget restrictions in times of crisis— to minimize the effects on well-being.

→ Abigail Solano, 71, has Parkinson Disease. She does not remember the ELCA visit in 2010. Her two daughters take care of her in Simijaca.

4. Once again the estimation is of the difference of differences and uses the information from the 2010-2013 panel data.

## References

Carter, M., Little, P., Mogues, T., and Negatu, W. (2007). "Poverty Traps and Natural Disasters in Ethiopia and Honduras." *World Development, 35*:5, mayo, pp 835-856.

Foa, R. (2013). *Household Risk Preparation Indices: Construction and Diagnostics*. Background paper World Development Report.

Harmeling, S. (2012). "Who suffers most from extreme weather events? Weather-related loss events in 2010 and 1991 to 2010." November *Germanwatch e. V*.

World Bank (2014). *World Development Report 2014: Risk and Opportunity Managing Risk for Development*. Washington DC: World Bank.

# Annex 1

## Shocks

| Urban area | | Incidence (% of households) | Incidence (% of households) medium to high economic impact |
|---|---|---|---|
| Health | Accident or sickness of member | 25,12 | 18,58 |
| Family | Death of the household head or spouse | 1,46 | 1,19 |
| | Death of members | 2,48 | 1,33 |
| | Separation of the spouses | 6,56 | 3,73 |
| | Arrival or stay of relative | 12,28 | 4,15 |
| Employment | Household head loses job | 14,02 | 12,65 |
| | Spouse loses job | 7,63 | 5,47 |
| | Other member of household loses job | 6,19 | 4,85 |
| Household assets | Had to move house | 7,05 | 3,1 |
| | Loss of house | 0,16 | 0,15 |
| | Deposit loss or cutback | 1,84 | 1,44 |
| | Robbery, fire or destruction of assets | 7,84 | 4,89 |
| Production | Bankruptcy and/or closure of business | 4,36 | 3,33 |
| Violence | Victims of the violence | 1,85 | 1,31 |
| Disasters | Experienced floods, avalanches, landslides, etc. | 8,51 | 3,85 |

| Rural micro-regions | | Incidence (% of households) | Incidence (% of households) medium to high economic impact |
|---|---|---|---|
| Health | Accident or sickness of member | 28,02 | 22,22 |
| Family | Death of the household head or spouse | 1,82 | 1,53 |
| | Death of some members | 3,31 | 2,31 |
| | Separation of the spouses | 4,8 | 2,64 |
| | Arrival or stay of relative | 9,33 | 2,3 |
| Employment | Household head loses job | 6,24 | 5,53 |
| | Spouse loses job | 1,74 | 1,63 |
| | Other member of household loses job | 2,29 | 2 |
| Household assets | Had to move house | 7,57 | 4,18 |
| | Loss of house | 1,89 | 1,61 |
| | Loss or cutback of deposits | 2,83 | 2,04 |
| | Robbery, fire or destruction of assets | 3,34 | 2,43 |
| Production | Bankruptcy and/or closure of business | 2,01 | 1,79 |
| | Plagues or loss of crops | 29,07 | 25,8 |
| | Loss or death of livestock | 21,99 | 16,26 |
| Violence | Victims of the violence | 2,25 | 0,61 |
| Disasters | Experienced floods, avalanches, landslides, etc. | 25,33 | 14,01 |

## Responses to Shocks

| Urban area | |
|---|---|
| Work-related | Members who did not work, looked for work or started working |
| | Members that work increased their work hours |
| Migration | One or more members left the country |
| | Changed town or department |
| | Changed home within same town |
| Savings and assets | Spent savings |
| | Sold goods or assets |
| | Mortgaged or rented some asset |
| Debts and insurance | Went into debt with a bank or financial entity |
| | Went into debt with family or friends |
| | Used insurance |
| | Bought insurance, for example home or health |
| Human capital | Took the children out of school or university |
| | Changed kids to cheaper school or university |
| | Decreased food expenses |
| Aid | Asked for aid from family, friends or other people from community |
| | Asked for aid from national or international institutions |
| Nothing | It was not necessary to alter the customs of the household |
| Could not do anything | Wanted to do something, but could not due to lack of resources or possibilities. |
| Other | Other |

| Rural micro-regions | |
|---|---|
| Work-related | Members who did not work, looked for work or started working |
| | Members that work increased their work hours |
| Migration | One or more members left the country |
| | Changed town or department |
| | Changed home within same town |
| Savings and assets | Spent savings |
| | Sold goods or assets |
| | Mortgaged or rented some asset |
| Debts and insurance | Went into debt with a bank or financial entity |
| | Went into debt with family or friends |
| | Used insurance |
| | Bought insurance, for example home or health |
| Human capital | Took the children out of school or university |
| | Changed kids to cheaper school or university |
| | Decreased food expenses |
| Aid | Asked for aid from family, friends or other people from community |
| | Asked for aid from national or international institutions |
| Agriculture and livestock | Sacrifice livestock |
| | Increase the use of fungicides or feed for livestock |
| Nothing | It was not necessary to alter household habits |
| Could not do anything | Wanted to do something, but could not due to lack of resources or possibilities. |
| Other | Other |